

INSTRUCTOR /ELECTRICAL DEPARTMENT

SECTION - A

GENERAL SUBJECTS

a) Awareness of ISO 9000, Total Quality Management and ISO - 14000 Standards

1. What does ISO stand for?

- A) International Standards Organization
- B) Indian Standards Order
- C) International Organization for Standardization
- D) Industrial Safety Organization

Answer: C

2. Which of the following ISO series relates to quality management?

- A) ISO 5000
- B) ISO 9000
- C) ISO 3000
- D) ISO 10000

Answer: B

3. ISO 9001 focuses on:

- A) Environmental management
- B) Energy conservation
- C) Quality management system
- D) Financial audits

Answer: C

4. TQM stands for:

- A) Total Quantity Management
- B) Total Quality Maintenance
- C) Total Quality Management
- D) Total Quick Management

Answer: C

5. Which one of the following is a core principle of TQM?

- A) High profits
- B) Customer focus
- C) Speed delivery
- D) Market expansion

Answer: B

6. The ISO 14000 family relates to:

- A) Quality control
- B) Electrical standards
- C) Environmental management
- D) Mechanical safety

Answer: C

7. The first step in ISO 9000 implementation is:

- A) Internal audit
- B) Documentation review
- C) Management commitment
- D) Certification

Answer: C

8. What does QMS stand for in ISO terminology?

- A) Quality Maintenance System
- B) Quality Monitoring System
- C) Quality Management System
- D) Quantity Management System

Answer: C

9. Which clause in ISO 9001 deals with customer satisfaction?

- A) Clause 8
- B) Clause 5
- C) Clause 6
- D) Clause 10

Answer: A

10. Which of these is NOT a principle of TQM?

- A) Customer focus
- B) Process approach
- C) Continual improvement
- D) Individual excellence

Answer: D

11. What is the main goal of ISO 9001 certification?

- A) Profit maximization
- B) Standardizing company operations
- C) Improving brand image
- D) Employee satisfaction

Answer: B) Standardizing company operations

12. Which year was the ISO 9000 series first introduced?

- A) 1980
- B) 1987

C) 1995

D) 2000

Answer: B) 1987

13. ISO 9001 applies to which type of organizations?

A) Only manufacturing industries

B) Only service industries

C) Only government agencies

D) All types of organizations

Answer: D) All types of organization

14. What is the main benefit of ISO 9001 certification?

A) Reduced government inspections

B) Increased product recalls

C) Enhanced customer satisfaction

D) Higher taxation benefits

Answer: C) Enhanced customer satisfaction

15. Which of the following is NOT a key principle of ISO 9001?

A) Customer focus

B) Leadership

C) Teamwork

D) Continual improvement

Answer: C) Teamwork

16. In ISO 9001, what is meant by "continual improvement"?

A) Always increasing prices

B) Consistently improving business processes

C) Expanding company size

D) Hiring more employees

Answer: B) Consistently improving business processes

17. What is an audit in the context of ISO 9001?

A) A financial inspection

B) A process of checking compliance with standards

C) A government requirement

D) A legal investigation

Answer: B) A process of checking compliance with standards

18. Who is responsible for implementing a Quality Management System (QMS) in an organization?

A) Only the quality control team

B) Only the management

C) All employees in the organization

D) Only external auditors

Answer: C) All employees in the organization

19. What is the purpose of ISO 9001 documentation?

A) To make management decisions

B) To increase paperwork

C) To ensure processes are clearly defined and followed

D) To satisfy customers

Answer: C) To ensure processes are clearly defined and followed

20. What is a Corrective Action in ISO 9001?

A) A punishment for mistakes

B) A method to prevent problems from recurring

C) A way to increase work pressure

D) A reward system

Answer: B) A method to prevent problems from recurring

21. ISO 9001 certification is valid for how many years?

A) 1 year

B) 2 years

C) 3 years

D) 5 years

Answer: C) 3 years

22. Which of the following is NOT included in ISO 9001:2015?

A) Risk-based thinking

B) Quality policy

C) Employee personal goals

D) Customer focus

Answer: C) Employee personal goals

23. What is the meaning of "PDCA cycle" in TQM?

A) Plan, Do, Check, Act

B) Process, Deliver, Control, Audit

C) Perform, Develop, Continue, Assess

D) Plan, Design, Check, Align

Answer: A) Plan, Do, Check, Act

24. The term "Kaizen" in TQM refers to:

A) Continuous improvement

B) Employee rewards

C) Statistical process control

D) Work safety measures

Answer: A) Continuous improvement

25. Which of the following is NOT a part of ISO 9001 Quality Management System?

- A) Customer Satisfaction
- B) Leadership
- C) Employee personal goals
- D) Process Approach

Answer: C) Employee personal goals

26. What is the purpose of an internal audit in ISO 9001?

- A) To identify errors and opportunities for improvement
- B) To fire employees
- C) To satisfy government regulations
- D) To reduce employee salaries

Answer: A) To identify errors and opportunities for improvement

27. Which clause of ISO 9001:2015 focuses on risk-based thinking?

- A) Clause 4
- B) Clause 5
- C) Clause 6
- D) Clause 7

Answer: C) Clause 6

28. What is the purpose of ISO 14001?

- A) Improving environmental performance
- B) Increasing tax benefits
- C) Controlling business competition
- D) Reducing customer complaints

Answer: A) Improving environmental performance

29. What is the first step in getting ISO 9001 certified?

- A) Hiring an external auditor
- B) Developing a quality policy
- C) Submitting tax returns
- D) Hiring more employees

Answer: B) Developing a quality policy

30. What is a "non-conformance" in ISO 9001?

- A) A process that does not meet standards
- B) A legal violation
- C) A product that is defective
- D) A management decision

Answer: A) A process that does not meet standards

31. Which international body is responsible for issuing ISO standards?

- A) United Nations
- B) World Trade Organization
- C) International Organization for Standardization
- D) World Bank

Answer: C) International Organization for Standardization

32. ISO 14001 focuses on which area of management?

- A) Quality control
- B) Environmental management
- C) Supply chain management
- D) Risk assessment

Answer: B) Environmental management

33. Which of these ISO standards relates to health and safety?

- A) ISO 45001
- B) ISO 9001
- C) ISO 22000
- D) ISO 50001

Answer: A) ISO 45001

34. Which document is mandatory for ISO 9001 certification?

- A) Quality Policy
- B) Marketing Plan
- C) Financial Statement
- D) Employee Handbook

Answer: A) Quality Policy

35. Which type of audit is conducted by a company itself?

- A) External Audit
- B) Internal Audit
- C) Third-party Audit
- D) Supplier Audit

Answer: B) Internal Audit

36. The purpose of ISO 14001 is to help organizations:

- A) Reduce environmental impact
- B) Increase profit margins
- C) Train employees
- D) Improve financial audits

Answer: A) Reduce environmental impact

37. ISO 9001 focuses on what kind of improvements?

- A) Cost reduction

- B) Customer satisfaction and efficiency
- C) Marketing strategies
- D) Branding improvement

Answer: B) Customer satisfaction and efficiency

38. A successful ISO 9001 audit results in:

- A) Certification
- B) Penalties
- C) Employee layoff
- D) Government intervention

Answer: A) Certification

39. What does the term “quality manual” refer to in ISO 9001?

- A) A user guide for equipment
- B) A document outlining the QMS of the organization
- C) An employee training manual
- D) A machine maintenance log

Answer: B) A document outlining the QMS of the organization

40. Which ISO standard defines the requirements for an Environmental Management System (EMS)?

- A) ISO 50001
- B) ISO 14001
- C) ISO 9001
- D) ISO 31000

Answer: B) ISO 14001

41. Which clause in ISO 9001:2015 addresses "Context of the Organization"?

- A) Clause 4
- B) Clause 6
- C) Clause 8
- D) Clause 10

Answer: A) Clause 4

42. What is “preventive action” in the context of ISO 9001?

- A) Action to punish employees for defects
- B) Action to eliminate potential causes of nonconformity
- C) Hiring more quality inspectors
- D) Increasing testing frequency

Answer: B) Action to eliminate potential causes of nonconformity

43. Which of these is NOT a benefit of ISO 14001?

- A) Better environmental compliance
- B) Reduced waste
- C) Higher energy consumption

D) Improved resource efficiency

Answer: C) Higher energy consumption

44. Total Quality Management (TQM) focuses on:

A) Only product quality

B) Reducing employee count

C) Quality in every aspect of the organization

D) Minimizing profits

Answer: C) Quality in every aspect of the organization

45. The process of identifying and removing causes of potential problems is known as:

A) Quality audit

B) Root cause analysis

C) Marketing

D) Budgeting

Answer: B) Root cause analysis

46. "Leadership" in ISO 9001 focuses on:

A) Employee promotions

B) Strong organizational direction and engagement

C) Product branding

D) Financial auditing

Answer: B) Strong organizational direction and engagement

47. Which of these is a tool used in TQM?

A) Fishbone diagram

B) SWOT analysis

C) Break-even chart

D) Product matrix

Answer: A) Fishbone diagram

48. ISO 9001 is based on how many quality management principles?

A) 5

B) 7

C) 10

D) 12

Answer: B) 7

49. A key environmental aspect covered under ISO 14001 includes:

A) Document retention

B) Employee leave tracking

C) Emissions to air or water

D) Profit and loss management

Answer: C) Emissions to air or water

50. What is the first phase in implementing ISO 14001?

- A) Documentation
- B) Continual improvement
- C) Environmental policy development
- D) Certification

Answer: C) Environmental policy development

51. What is the purpose of a quality policy in ISO 9001?

- A) To define employee benefits
- B) To establish customer complaint mechanisms
- C) To set the overall intentions and direction for quality
- D) To manage financial resources

Answer: C) To set the overall intentions and direction for quality

52. Which document provides evidence that an organization conforms to ISO standards?

- A) Purchase Order
- B) Audit Report
- C) ISO Certificate
- D) Bill of Materials

Answer: C) ISO Certificate

53. ISO 14001 requires organizations to consider which aspect of their operations?

- A) Profit sharing
- B) Environmental impacts
- C) Inventory levels
- D) Employee turnover

Answer: B) Environmental impacts

54. What is the aim of corrective action under ISO standards?

- A) To redesign the product
- B) To eliminate the cause of a detected nonconformity
- C) To outsource manufacturing
- D) To replace workers

Answer: B) To eliminate the cause of a detected nonconformity

55. What is a key feature of the PDCA cycle?

- A) Create–Design–Analyze–Sell
- B) Plan–Do–Check–Act
- C) Prevent–Delay–Control–Adapt
- D) Pick–Draw–Copy–Answer

Answer: B) Plan–Do–Check–Act

56. TQM promotes continuous improvement through:

- A) Punishments

- B) Employee layoffs
- C) Employee involvement and feedback
- D) Only external audits

Answer: C) Employee involvement and feedback

57. ISO 9001:2015 replaced which previous version?

- A) ISO 9001:2005
- B) ISO 9001:2008
- C) ISO 9000:2010
- D) ISO 14001:2012

Answer: B) ISO 9001:2008

58. A key focus of ISO 14001 is on:

- A) Maximizing tax returns
- B) Managing environmental responsibilities
- C) Digital marketing
- D) Transport logistics

Answer: B) Managing environmental responsibilities

59. In ISO 9001, which clause relates to "Performance Evaluation"?

- A) Clause 8
- B) Clause 9
- C) Clause 6
- D) Clause 4

Answer: B) Clause 9

60. Which tool is used to analyze process variation in TQM?

- A) Gantt chart
- B) Control chart
- C) Pie chart
- D) SWOT matrix

Answer: B) Control chart

61. Which of the following is considered a nonconformity in ISO audits?

- A) Documented process
- B) Missing required records
- C) Employee training session
- D) Quality policy

Answer: B) Missing required records

62. ISO 14001 encourages which of the following actions?

- A) Ignoring legal compliance
- B) Reducing environmental impact
- C) Doubling production costs

D) Banning employee participation

Answer: B) Reducing environmental impact

63. Which of these is a measurable objective in ISO 9001?

A) Increase team lunches

B) Reduce customer complaints by 20%

C) Paint the office walls

D) Play music during work

Answer: B) Reduce customer complaints by 20%

64. What is the role of internal audits in ISO standards?

A) To fire unproductive employees

B) To check social media policy

C) To evaluate compliance and effectiveness

D) To design marketing plans

Answer: C) To evaluate compliance and effectiveness

65. One of the 7 Quality Tools in TQM is:

A) Sales funnel

B) Scatter diagram

C) Profit chart

D) Break-even analysis

Answer: B) Scatter diagram

66. The phrase “aspects and impacts” is most associated with which ISO?

A) ISO 9001

B) ISO 50001

C) ISO 14001

D) ISO 31000

Answer: C) ISO 14001

67. What does ISO stand for?

A) International Standards Option

B) Integrated Systems Organization

C) International Organization for Standardization

D) Internal Operational Safety

Answer: C) International Organization for Standardization

68. ISO 9000 family deals with:

A) Environmental management

B) Quality management systems

C) Workplace safety

D) Inventory optimization

Answer: B) Quality management systems

69. A risk-based approach in ISO 9001 aims to:

- A) Reduce employee strength
- B) Minimize internal auditing
- C) Prevent undesired effects and enhance improvements
- D) Eliminate training requirements

Answer: C) Prevent undesired effects and enhance improvements

70. What is the key benefit of continual improvement in ISO 9001?

- A) Increase paperwork
- B) Maintain status quo
- C) Enhance customer satisfaction
- D) Reduce staff training

Answer: C) Enhance customer satisfaction

71. A management review in ISO focuses on:

- A) Salary structure
- B) Reviewing the effectiveness of the management system
- C) Office interiors
- D) Cleaning schedule

Answer: B) Reviewing the effectiveness of the management system

72. ISO 14001 focuses on what kind of improvement?

- A) Only product quality
- B) Only profits
- C) Environmental performance
- D) Customer loyalty

Answer: C) Environmental performance

73. TQM was first widely implemented in which country?

- A) Germany
- B) India
- C) Japan
- D) USA

Answer: C) Japan

74. One of the main pillars of TQM is:

- A) Customer focus
- B) Financial control
- C) Advertising strategy
- D) Office cleanliness

Answer: A) Customer focus

75. Which ISO standard focuses on energy management?

- A) ISO 14001

- B) ISO 9001
- C) ISO 50001
- D) ISO 31000
- Answer:** C) ISO 50001

76. Which principle is not part of the ISO 9001 Quality Management Principles?

- A) Customer focus
- B) Leadership
- C) Profit maximization
- D) Evidence-based decision making
- Answer:** C) Profit maximization

77. Which clause in ISO 9001 refers to "Support"?

- A) Clause 5
- B) Clause 7
- C) Clause 6
- D) Clause 8
- Answer:** B) Clause 7

78. Which of the following is a benefit of implementing ISO 9001?

- A) Decreased customer trust
- B) Increased product defects
- C) Enhanced customer satisfaction
- D) Higher maintenance costs
- Answer:** C) Enhanced customer satisfaction

79. What is the term used in ISO 14001 for potential environmental harm?

- A) Environmental objective
- B) Environmental aspect
- C) Environmental impact
- D) Environmental hazard
- Answer:** C) Environmental impact

80. QM emphasizes improvement in:

- A) Only the final product
- B) Every aspect of the organization
- C) Only top management
- D) Marketing department only
- Answer:** B) Every aspect of the organization

81. The term Kaizen refers to:

- A) Major overhaul
- B) Continuous improvement
- C) Redundancy elimination

D) Supplier rejection

Answer: B) Continuous improvement

82. Which of the following is not an ISO 9001 requirement?

A) Risk-based thinking

B) Quality objectives

C) Legal certification

D) Management review

Answer: C) Legal certification

83. ISO 14000 series primarily targets:

A) Employee wages

B) Product design

C) Environmental management

D) Brand recognition

Answer: C) Environmental management

84. A Pareto Chart is used in quality control to:

A) Create training schedules

B) Identify vital few problems

C) Estimate delivery times

D) Record financial costs

Answer: B) Identify vital few problems

85. In ISO terms, nonconformity means:

A) Change request

B) Deviation from a requirement

C) Extra documentation

D) Delay in production

Answer: B) Deviation from a requirement

86. In TQM, "zero defects" means:

A) Zero sales

B) Zero products

C) No deviation from specifications

D) No customer service

Answer: C) No deviation from specifications

87. Which of these tools is NOT part of the 7 QC Tools?

A) Histogram

B) Flowchart

C) Radar chart

D) Check sheet

Answer: C) Radar chart

88. Which ISO standard is used for environmental performance evaluation?

- A) ISO 9004
- B) ISO 14031
- C) ISO 10001
- D) ISO 31000

Answer: B) ISO 14031

89. Which quality guru is associated with the Deming Cycle (PDCA)?

- A) Juran
- B) Crosby
- C) Deming
- D) Ishikawa

Answer: C) Deming

90. What does ISO 9004 focus on?

- A) Regulatory law
- B) Risk mitigation
- C) Sustained success of an organization
- D) Environmental auditing

Answer: C) Sustained success of an organization

91. What is the primary driver of customer satisfaction in ISO 9001?

- A) Social media presence
- B) Complaint handling only
- C) Meeting customer requirements
- D) Aggressive pricing

Answer: C) Meeting customer requirements

92. What tool helps identify root causes of defects?

- A) Control chart
- B) Scatter diagram
- C) Fishbone diagram
- D) Histogram

Answer: C) Fishbone diagram

93. ISO 14001 promotes which approach?

- A) Firefighting approach
- B) Lifecycle approach
- C) Departmental approach
- D) Quarterly review

Answer: B) Lifecycle approach

94. Process approach in ISO 9001 ensures:

- A) Sales control

- B) Isolation of departments
- C) Consistent and predictable results
- D) Fewer employees
- Answer:** C) Consistent and predictable results

95. What is a Quality Manual?

- A) A financial guide
- B) A document stating quality policies and procedures
- C) An equipment handbook
- D) Employee salary slips
- Answer:** B) A document stating quality policies and procedures

96. The term context of the organization in ISO 9001 refers to:

- A) Email communications
- B) Understanding internal and external factors
- C) Organizational logo
- D) Quality awards
- Answer:** B) Understanding internal and external factors

97. One of the objectives of environmental management systems is to:

- A) Maximize raw material use
- B) Ignore emission controls
- C) Prevent pollution
- D) Encourage industrial waste
- Answer:** C) Prevent pollution

98. ISO audits must be conducted:

- A) Only during emergencies
- B) At the request of customers
- C) At planned intervals
- D) After major accidents only
- Answer:** C) At planned intervals

99. ISO 9001 certification is valid for how many years?

- A) 2 years
- B) 3 years
- C) 4 years
- D) 5 years
- Answer:** B) 3 years

100. Which clause of ISO 14001 addresses planning?

- A) Clause 3
- B) Clause 5
- C) Clause 6

D) Clause 4

Answer: C) Clause 6

101. Which of the following is a continuous improvement tool in TQM?

A) SWOT analysis

B) PDCA cycle

C) PEST analysis

D) ROI calculation

Answer: B) PDCA cycle

101. The main cause of air pollution is:

A. Forests

B. Automobiles

C. Solar power

D. Windmills

Answer: B. Automobiles

102. ISO 14000 series deals with:

A. Food safety

B. Information security

C. Environmental management

D. Occupational safety

Answer: C. Environmental management

103. The greenhouse effect is primarily due to increase in:

A. Ozone

B. Nitrogen

C. Carbon dioxide

D. Hydrogen

Answer: C. Carbon dioxide

104. Which of the following is not a greenhouse gas?

A. CO₂

B. CH₄

C. O₂

D. N₂O

Answer: C. O₂

105. ISO 14001 specifies requirements for:

A. Product certification

B. EMS (Environmental Management System)

C. Quality assurance

D. Social responsibility

Answer: B. EMS (Environmental Management System)

106. Which is an example of water pollution?

- A. Acid rain
- B. Oil spill
- C. Smoke
- D. Noise

Answer: B. Oil spill

107. OHSAS 18001 relates to:

- A. Product standards
- B. Electrical safety
- C. Occupational health and safety
- D. Pollution control

Answer: C. Occupational health and safety

108. Which one of the following is a renewable resource?

- A. Coal
- B. Petroleum
- C. Wind
- D. Natural gas

Answer: C. Wind

109. ISO 14000 standards are issued by:

- A. Bureau of Indian Standards
- B. International Organization for Standardization
- C. United Nations
- D. WHO

Answer: B. International Organization for Standardization

110. Which of the following is not a component of ISO 14000?

- A. Life Cycle Assessment
- B. EMS
- C. Energy Efficiency Management
- D. Occupational Safety Audits

Answer: D. Occupational Safety Audits

111. Noise pollution is measured in:

- A. Newtons
- B. Watts
- C. Decibels
- D. Hertz

Answer: C. Decibels

112. The layer that protects the Earth from harmful UV rays is:

- A. Oxygen
- B. Carbon dioxide
- C. Ozone
- D. Nitrogen

Answer: C. Ozone

113. OHSAS stands for:

- A. Occupational Health and Safety Assessment Series
- B. Occupational Hazard and Safety Action Series
- C. Official Health and Safety Audit Standard
- D. Organization for Health and Safety Assessment

Answer: A. Occupational Health and Safety Assessment Series

114. The ISO 14000 series does NOT include standards for:

- A. Auditing
- B. Labeling
- C. Financial accounting
- D. Environmental performance evaluation

Answer: C. Financial accounting

115. The Kyoto Protocol is related to:

- A. Trade
- B. Environment
- C. Weapons
- D. Education

Answer: B. Environment

116. Water pollution is commonly tested by measuring:

- A. BOD
- B. COD
- C. Both A and B
- D. None of these

Answer: C. Both A and B

117. The ISO 14001 certification is valid for:

- A. 5 years
- B. 3 years
- C. 10 years
- D. Lifetime

Answer: B. 3 years

118. Which of these is considered hazardous waste?

- A. Paper
- B. Plastic

C. Batteries

D. Wood

Answer: C. Batteries

119. The process of reducing environmental damage at the source is called:

A. Pollution treatment

B. Pollution transfer

C. Pollution prevention

D. Pollution substitution

Answer: C. Pollution prevention

120. Which of the following contributes most to acid rain?

A. CO

B. SO₂

C. H₂

D. O₂

Answer: B. SO₂

121. Which Indian act deals with environmental protection?

A. IPC Act

B. Environment Protection Act

C. IT Act

D. Wildlife Act

Answer: B. Environment Protection Act

122. The OHSAS standard that deals with health and safety is:

A. 14001

B. 9001

C. 18001

D. 50001

Answer: C. 18001

123. Which of these gases depletes the ozone layer?

A. CO₂

B. SO₂

C. CFCs

D. O₂

Answer: C. CFCs

124. EMS stands for:

A. Environmental Management System

B. Energy Monitoring Setup

C. Engineering Maintenance System

D. Earth Monitoring Standards

Answer: A. Environmental Management System

125. One of the primary goals of ISO 14001 is to:

- A. Ensure product quality
- B. Increase employee productivity
- C. Reduce environmental impact
- D. Maintain profit levels

Answer: C. Reduce environmental impact

126. Which of the following is a non-renewable energy source?

- A. Solar energy
- B. Wind energy
- C. Biomass
- D. Natural gas

Answer: D Natural gas

127. The full form of BOD is:

- A. Biological Oxygen Demand
- B. Basic Oxide Discharge
- C. Base Oil Density
- D. Binary Output Distribution

Answer: A

128. Carbon monoxide is dangerous because it:

- A. Causes water pollution
- B. Blocks UV rays
- C. Binds to hemoglobin
- D. Is visible

Answer: C

129. Environmental impact assessment is done:

- A. Before project approval
- B. During project execution
- C. After project completion
- D. Not required

Answer: A

130. A key benefit of implementing ISO 14001 is:

- A. Increased tax
- B. Decreased employee performance
- C. Regulatory compliance
- D. Higher pollution

Answer: C

131. Which of these is a component of an EMS (Environmental Management System)?
A. Waste management
B. Disaster management
C. Data protection
D. Customer satisfaction
Answer: A
132. The primary source of groundwater contamination is:
A. Pesticides
B. UV radiation
C. Noise
D. Thermal pollution
Answer: A
133. The use of CFCs was banned to prevent:
A. Soil pollution
B. Ozone layer depletion
C. Water contamination
D. Noise pollution
Answer: B
134. Which of the following is an example of renewable energy?
A. Coal
B. Solar
C. Natural gas
D. Petroleum
Answer: B
135. ISO 14001 is specifically designed for:
A. Government organizations
B. Environmental management
C. Product manufacturing
D. Office administration
Answer: B
136. Which of the following pollutants is most commonly associated with urban smog?
A. CO₂
B. Ozone
C. Nitrogen oxide
D. Water vapor
Answer: B
137. Which is an effect of global warming?
A. Increase in ozone layer thickness

- B. Increase in sea level
- C. Decrease in surface temperatures
- D. All of the above

Answer: B

138. Which of the following is a part of ISO 14001 implementation?

- A. Organizational health plan
- B. Continuous environmental improvements
- C. Annual financial reporting
- D. Employee vacations

Answer: B

139. Which is NOT a direct source of water pollution?

- A. Industrial discharge
- B. Agricultural runoff
- C. Natural forest fires
- D. Sewage treatment plants

Answer: C

140. Which of the following is an example of a natural air pollutant?

- A. Carbon dioxide
- B. Forest fires
- C. Lead
- D. Carbon monoxide

Answer: B

141. The process of converting waste materials into reusable objects is known as:

- A. Pollution
- B. Recycling
- C. Decomposition
- D. Incineration

Answer: B

142. The full form of "EMS" in environmental management is:

- A. Environmental Monitoring System
- B. Environmental Management System
- C. Energy Monitoring System
- D. Environment Monitoring Safety

Answer: B

143. Which pollutant is primarily responsible for acid rain?

- A. CO
- B. NO₂
- C. SO₂

D. CO₂

Answer: C

144. A common consequence of deforestation is:

- A. Soil erosion
- B. Climate stabilization
- C. Water conservation
- D. Increased crop yield

Answer: A

145. ISO 14000 standards aim to:

- A. Ensure product quality
- B. Promote environmental sustainability
- C. Increase profit margins
- D. Improve employee productivity

Answer: B

146. What is the main purpose of ISO 14004?

- A. Quality control
- B. Setting up environmental management systems
- C. Employee safety
- D. Waste management

Answer: B

147. The reduction of waste, energy, and material consumption is known as:

- A. Pollution prevention
- B. Resource depletion
- C. Renewable energy
- D. Carbon offset

Answer: A

148. Which of the following does not fall under environmental pollution?

- A. Air pollution
- B. Water pollution
- C. Soil pollution
- D. Economic pollution

Answer: D

149. A major effect of deforestation is:

- A. Decreased global temperatures
- B. Increased oxygen production
- C. Increased carbon dioxide in the atmosphere
- D. Decreased air pollution

Answer: C

150. The harmful substance that is primarily found in exhaust fumes from cars is:
A. Nitrogen dioxide
B. Sulfur dioxide
C. Carbon monoxide
D. Ozone
Answer: C

151. Which of the following gases is most responsible for acid rain formation?
A. Nitrogen
B. Sulfur dioxide
C. Oxygen
D. Carbon dioxide
Answer: B

152. Which international agreement aims to reduce greenhouse gas emissions?
A. Paris Agreement
B. Kyoto Protocol
C. Montreal Protocol
D. Geneva Accord
Answer: B

153. Which of these pollutants is the main cause of smog?
A. Sulfur dioxide
B. Ozone
C. Nitrogen oxide
D. Methane
Answer: B

154. What is the purpose of an environmental audit?
A. Financial evaluation
B. Ensuring compliance with environmental laws
C. Identifying health issues
D. Evaluating employee productivity
Answer: B

155. Which gas is considered the most significant contributor to global warming?
A. Oxygen
B. Carbon dioxide
C. Nitrogen
D. Argon
Answer: B

156. The major effect of sulfur dioxide emissions is:
A. Ozone depletion

- B. Acid rain formation
- C. Water vapor increase
- D. Soil enrichment

Answer: B

157. The ozone layer primarily protects the Earth from:

- A. Ultraviolet radiation
- B. Heat waves
- C. Tsunamis
- D. Earthquakes

Answer: A

158. The ISO 14000 family of standards is focused on:

- A. Pollution control
- B. Environmental management
- C. Quality management
- D. Health and safety

Answer: B

159. Which of the following is not a renewable energy source?

- A. Solar energy
- B. Wind energy
- C. Coal
- D. Biomass

Answer: C

160. The major goal of OHSAS 18001 is to:

- A. Ensure environmental sustainability
- B. Improve product quality
- C. Ensure health and safety at the workplace
- D. Reduce water usage

Answer: C

161. Which of the following chemicals contributes most to ozone layer depletion?

- A. Methane
- B. Chlorofluorocarbons (CFCs)
- C. Nitrous oxide
- D. Oxygen

Answer: B

162. ISO 14004 provides guidelines for:

- A. Environmental auditing
- B. General environmental management
- C. Product safety

D. Greenhouse gas mitigation

Answer: B

163. Which of the following is considered a hazardous waste material?

A. Wood shavings

B. Paint thinner

C. Paper

D. Plastic bottles

Answer: B

164. What does BOD stand for in environmental terms?

A. Biooxygen demand

B. Biological oxygen demand

C. Basic oxygen demand

D. Biochemical ozone demand

Answer: B

165. The ozone layer is located in which part of the atmosphere?

A. Troposphere

B. Stratosphere

C. Mesosphere

D. Thermosphere

Answer: B

166. The process of reducing pollution at the source of creation is:

A. Pollution transfer

B. Pollution treatment

C. Pollution prevention

D. Pollution recycling

Answer: C

167. Which of the following is a consequence of water pollution?

A. Decreased water temperature

B. Disruption of aquatic life

C. Increased oxygen levels

D. Increased aquatic biodiversity

Answer: B

168. Which of these gases is not harmful to the environment?

A. Methane

B. Nitrous oxide

C. Oxygen

D. Carbon dioxide

Answer: C

- 169.** Ozone depletion leads to:
A. Better crop yield
B. Higher UV radiation
C. Increased water pollution
D. Lower global temperatures
Answer: B
- 170.** The full form of ISO 14001 is:
A. International Standards for Operations
B. International Organization for Occupational Safety
C. Environmental Management System
D. Environmental Standards for Organizations
Answer: C
- 171.** Which of the following is an example of solid waste pollution?
A. Landfill
B. Smoke
C. Acid rain
D. Water contamination
Answer: A
- 172.** The carbon footprint refers to:
A. The amount of waste produced by humans
B. The total greenhouse gases produced by human activities
C. The amount of coal mined
D. The deforestation caused by human activities
Answer: B
- 173.** Which of these sources is responsible for a large portion of air pollution?
A. Volcanoes
B. Automobiles
C. Solar panels
D. Wind turbines
Answer: B
- 174.** Which of the following is a primary objective of the ISO 14001 standard?
A. Reducing pollution
B. Enhancing profit margins
C. Improving workplace safety
D. Reducing production costs
Answer: A
- 175.** What is the full form of CFCs?
A. Carbonic Fluoride Chemicals

- B. Chlorofluorocarbons
- C. Carbon Fluorocarbon
- D. Chloride Fluorocarbons

Answer: B

176. What is the primary objective of OHSAS 18001?

- A. Quality management
- B. Occupational health and safety management
- C. Environmental management
- D. Financial management

Answer: B

177. The depletion of the ozone layer can lead to an increase in:

- A. Heat waves
- B. UV radiation reaching Earth's surface
- C. Carbon dioxide emissions
- D. Greenhouse gas effects

Answer: B

178. Which of these is a major source of thermal pollution?

- A. Factories releasing heated water into rivers
- B. Vehicle exhaust fumes
- C. Deforestation
- D. Ozone depletion

Answer: A

179. Which of the following is classified as hazardous waste under the ISO 14000 standards?

- A. Paper
- B. Household garbage
- C. Industrial chemical waste
- D. Organic compost

Answer: C

180. What does "environmental stewardship" mean in the context of environmental management?

- A. Profit maximization
- B. Ethical management of natural resources
- C. Restricting economic growth
- D. Limiting the workforce

Answer: B

181. The major cause of deforestation is:

- A. Pollution
- B. Urbanization and agriculture

- C. Rainfall patterns
- D. Soil erosion

Answer: B

182. ISO 14000 standards aim to reduce:

- A. Air pollution
- B. Greenhouse gas emissions
- C. Noise pollution
- D. Energy consumption

Answer: B

183. Which of the following is NOT a greenhouse gas?

- A. Carbon dioxide
- B. Methane
- C. Nitrous oxide
- D. Oxygen

Answer: D

184. Which of the following is a cause of land pollution?

- A. Ozone layer depletion
- B. Excessive use of pesticides
- C. Emission of sulfur dioxide
- D. Noise from traffic

Answer: B

185. Which of the following is an impact of acid rain?

- A. Decreased UV radiation
- B. Damage to aquatic ecosystems
- C. Decrease in global warming
- D. Improved plant growth

Answer: B

186. ISO 14004 provides guidelines for:

- A. Environmental performance evaluation
- B. Environmental management systems
- C. Environmental product certification
- D. Climate change policy

Answer: B

187. A significant consequence of poor waste management is:

- A. Increased oxygen production
- B. Land degradation
- C. Improved biodiversity

D. Reduction in soil erosion

Answer: B

188. Which of these gases contributes the most to the formation of smog?

A. Carbon dioxide

B. Nitrogen oxides

C. Ozone

D. Oxygen

Answer: B

189. What is the main effect of water pollution on human health?

A. Skin diseases

B. Respiratory issues

C. Gastrointestinal problems

D. Heart disease

Answer: C

190. Which of the following materials is most commonly recycled?

A. Metals

B. Plastics

C. Paper

D. Wood

Answer: C

191. Which of the following is true about non-renewable energy sources?

A. They are replenished at a rapid rate

B. They contribute to global warming

C. They have no environmental impact

D. They are free of carbon emissions

Answer: B

192. The major objective of ISO 14001 is to:

A. Manage environmental impacts

B. Ensure food safety

C. Reduce operational costs

D. Increase customer satisfaction

Answer: A

193. Which of the following is a method of controlling air pollution?

A. Using green technologies in factories

B. Reducing solar energy consumption

C. Increasing car usage

D. Wasting water

Answer: A

- 194.** The term "Ecosystem services" refers to:
A. Services provided by the government to protect the environment
B. The benefits humans receive from ecosystems
C. Pollution control systems in industries
D. Services related to waste management
Answer: B
- 195.** Which of the following pollutants is primarily linked to the depletion of the ozone layer?
A. Carbon dioxide
B. Methane
C. CFCs
D. Nitrous oxide
Answer: C
- 196.** What is the main source of air pollution in urban areas?
A. Industrial emissions
B. Domestic cooking
C. Vehicle exhaust
D. Agricultural activities
Answer: C
- 197.** Which of the following is NOT an objective of the ISO 14000 family of standards?
A. To help organizations reduce their environmental footprint
B. To improve financial management
C. To support sustainable environmental practices
D. To enhance environmental reporting
Answer: B
- 198.** Which of the following actions will reduce energy consumption in an office environment?
A. Installing energy-efficient lighting
B. Increasing air conditioning usage
C. Reducing waste disposal
D. Increasing travel for meetings
Answer: A
- 199.** Which of the following is NOT a principle of ISO 14001?
A. Environmental protection
B. Continual improvement
C. Transparency
D. Profit maximization
Answer: D

200. What does ISO 9000 deal with?

- A) Environmental management
- B) Occupational health and safety
- C) Quality management systems
- D) Product manufacturing standards

Answer: C) Quality management systems

201. What is the purpose of ISO 9000?

- A) To provide guidelines for environmental sustainability
- B) To define the criteria for quality management systems
- C) To set performance standards for employees
- D) To regulate product manufacturing processes

Answer: B) To define the criteria for quality management systems

202. Which of the following is NOT a principle of ISO 9000?

- A) Customer focus
- B) Continual improvement
- C) Organizational hierarchy
- D) Evidence-based decision making

Answer: C) Organizational hierarchy

203. Which ISO standard provides the criteria for quality management systems?

- A) ISO 14001
- B) ISO 9001
- C) ISO 50001
- D) ISO 45001

Answer: B) ISO 9001

204. What does "continuous improvement" refer to in ISO 9000?

- A) Focusing on product quality
- B) Maintaining the status quo
- C) Regularly upgrading machinery
- D) Improving processes and systems regularly

Answer: D) Improving processes and systems regularly

205. What does the term "customer focus" mean in ISO 9000?

- A) Focusing only on product manufacturing
- B) Ensuring that customer requirements are met and exceeded
- C) Building customer relations through social media

D) Avoiding complaints from customers

Answer: B) Ensuring that customer requirements are met and exceeded

206. What is the main benefit of adopting an ISO 9000 quality management system?

A) Increased revenue

B) Improved customer satisfaction and loyalty

C) Higher product prices

D) Decreased employee workload

Answer: B) Improved customer satisfaction and loyalty

207. Which of the following is a requirement for ISO 9000 certification?

A) Third-party verification of processes

B) Employee training in quality management

C) Documentation of processes and policies

D) A reduction in the number of products manufactured

Answer: C) Documentation of processes and policies

208. Which of the following is NOT a component of a quality management system (QMS)?

A) Quality planning

B) Quality control

C) Environmental management

D) Quality assurance

Answer: C) Environmental management

209. ISO 9000 applies to organizations of which size?

A) Only large organizations

B) Only small businesses

C) Organizations of all sizes

D) Only manufacturing organizations

Answer: C) Organizations of all sizes

210. What does ISO 9000 certification indicate?

A) The company has the lowest prices in the market

B) The company meets certain quality management standards

C) The company has a global customer base

D) The company uses the latest technology

Answer: B) The company meets certain quality management standards

211. How often should an organization conduct internal audits to ensure compliance with ISO 9000?

- A) Once every five years
- B) Once a year
- C) Periodically, as defined in the QMS
- D) Every time a new product is introduced

Answer: C) Periodically, as defined in the QMS

212. Which of the following is an example of "documented information" in an ISO 9000 quality management system?

- A) Employee performance reviews
- B) Product quality checks
- C) Customer feedback forms
- D) All of the above

Answer: D) All of the above

213. What does "risk-based thinking" mean in the context of ISO 9000?

- A) Minimizing all risks to avoid product defects
- B) Identifying and addressing risks that can affect product quality
- C) Ignoring minor risks as long as they don't affect the customer
- D) Eliminating all risks through automation

Answer: B) Identifying and addressing risks that can affect product quality

214. What role does top management play in ISO 9000?

- A) Implementing technical controls
- B) Overseeing the quality management system and supporting its success
- C) Limiting quality management to specific departments
- D) Ensuring the product is manufactured in high volumes

Answer: B) Overseeing the quality management system and supporting its success

215. What is "nonconformity" in ISO 9000 terms?

- A) A product that has been fully tested
- B) A deviation from the defined processes or requirements
- C) A product that exceeds customer expectations
- D) An improvement suggestion from employees

Answer: B) A deviation from the defined processes or requirements

216. Which document provides the basis for an organization's quality policy in ISO 9000?

- A) Internal audit report

- B) Quality manual
- C) Financial report
- D) Marketing plan

Answer: B) Quality manual

217. What does ISO 9000 emphasize regarding employee involvement?

- A) Employees should only follow instructions without contributing to improvements
- B) Employees should be involved in decisions that impact the quality of products and services
- C) Employee involvement is optional
- D) Employee involvement is limited to administrative tasks only

Answer: B) Employees should be involved in decisions that impact the quality of products and services

218. How does ISO 9000 define "customer satisfaction"?

- A) Customer satisfaction is not a major focus of ISO 9000
- B) It's based on the number of products sold
- C) It is based on whether customer requirements are met or exceeded
- D) It is measured only by customer complaints

Answer: C) It is based on whether customer requirements are met or exceeded

219. What does the ISO 9000 standard say about continuous improvement?

- A) It is optional, based on customer requests
- B) It should be done once a year to assess progress
- C) Organizations should make ongoing improvements to products, processes, and systems
- D) It should be avoided to maintain consistency in product quality

Answer: C) Organizations should make ongoing improvements to products, processes, and systems

220. Which of the following is a characteristic of a well-documented quality management system (QMS) under ISO 9000?

- A) It should be complex and highly detailed
- B) It should be easy to understand, follow, and maintain
- C) It should only contain technical specifications
- D) It should focus only on product manufacturing

Answer: B) It should be easy to understand, follow, and maintain

221. What does ISO 9000 recommend for handling customer complaints?

- A) Ignoring complaints if they are minor

- B) Documenting complaints and addressing them promptly
- C) Reassigning complaints to the lowest-level employee
- D) Denying complaints when they are unreasonable

Answer: B) Documenting complaints and addressing them promptly

222. What is the first step in implementing an ISO 9000 quality management system?

- A) Developing a marketing strategy
- B) Defining the quality policy and objectives
- C) Conducting employee training
- D) Reducing product costs

Answer: B) Defining the quality policy and objectives

223. What does ISO 9000 require regarding supplier relationships?

- A) Suppliers should be selected based on price alone
- B) Suppliers should be ignored unless issues arise
- C) Organizations should establish mutually beneficial relationships with suppliers
- D) Organizations should never rely on external suppliers

Answer: C) Organizations should establish mutually beneficial relationships with suppliers

224. What is the purpose of conducting a management review in ISO 9000?

- A) To assess the financial performance of the organization
- B) To evaluate the effectiveness of the quality management system
- C) To decide on employee promotions
- D) To monitor product inventory levels

Answer: B) To evaluate the effectiveness of the quality management system

225. Which of the following best describes "quality assurance" in ISO 9000?

- A) A method to check the performance of employees
- B) A process to ensure products meet specific requirements through systematic monitoring and verification
- C) A way to reduce production costs
- D) A tool for increasing product sales

Answer: B) A process to ensure products meet specific requirements through systematic monitoring and verification

226. What is the purpose of a "corrective action" in ISO 9000?

- A) To increase production volume
- B) To investigate and resolve causes of nonconformities and prevent their recurrence
- C) To raise employee salaries

D) To improve marketing strategies

Answer: B) To investigate and resolve causes of nonconformities and prevent their recurrence

227. Which of the following is an example of a quality objective according to ISO 9000?

A) Reducing the number of customer complaints by 10%

B) Increasing product variety

C) Decreasing employee work hours

D) Implementing a new marketing campaign

Answer: A) Reducing the number of customer complaints by 10%

228. What is the role of "internal audits" in ISO 9000?

A) To evaluate the organization's financial performance

B) To ensure that the QMS is operating effectively and identify areas for improvement

C) To replace external audits

D) To test the physical durability of products

Answer: B) To ensure that the QMS is operating effectively and identify areas for improvement

229. Which of the following documents is required for ISO 9000 compliance?

A) Marketing plan

B) Quality manual

C) Environmental audit report

D) Product inventory list

Answer: B) Quality manual

230. In the context of ISO 9000, what does "documented information" refer to?

A) All physical products manufactured by the organization

B) The documentation required to prove compliance with the QMS, including policies, procedures, and records

C) Only internal audit reports

D) Marketing materials and brochures

Answer: B) The documentation required to prove compliance with the QMS, including policies, procedures, and records

231. What is the role of "top management" in an ISO 9000 quality management system?

A) To oversee the production process

B) To ensure adequate resources are provided and to lead by example in quality management

C) To handle customer complaints directly

D) To control the finances of the company

Answer: B) To ensure adequate resources are provided and to lead by example in quality management

232. How often should a management review meeting be held according to ISO 9000?

A) Once every two years

B) Once a year or more frequently if necessary

C) Every time a new product is launched

D) Whenever there is a quality complaint

Answer: B) Once a year or more frequently if necessary

233. What does ISO 9000 require regarding employee competency?

A) All employees should be trained in quality management principles

B) Only top management needs to be trained

C) Only manufacturing staff need to be trained

D) There is no requirement for employee competency

Answer: A) All employees should be trained in quality management principles

234. Which of the following is a key requirement for the "risk-based thinking" principle in ISO 9000?

A) Ignoring minor risks to focus on major ones

B) Organizations must identify risks and take actions to mitigate or control them

C) Taking risks without assessing the potential impact

D) Only considering risks in the production department

Answer: B) Organizations must identify risks and take actions to mitigate or control them

235. What is the role of the "quality policy" in ISO 9000?

A) To document customer complaints

B) To establish the organization's commitment to quality and set measurable objectives

C) To describe the financial goals of the organization

D) To define the pricing strategy for products

Answer: B) To establish the organization's commitment to quality and set measurable objectives

236. Which of the following is an example of a quality management system (QMS) document according to ISO 9000?

A) Strategic business plan

B) Quality objectives and plans

C) Tax filing records

D) Employee holiday schedule

Answer: B) Quality objectives and plans

237. How does ISO 9000 suggest organizations handle nonconformities?

A) Ignore them to focus on production goals

B) Correct and prevent recurrence by addressing the root cause

C) Replace defective products with new ones without investigation

D) Penalize employees involved in nonconformities

Answer: B) Correct and prevent recurrence by addressing the root cause

238. What is the primary goal of an "internal audit" in ISO 9000?

A) To identify product defects

B) To check the financial performance of the company

C) To evaluate whether the quality management system is functioning effectively

D) To track employee performance

Answer: C) To evaluate whether the quality management system is functioning effectively

239. What does ISO 9000 require for the control of external providers (suppliers)?

A) The organization must work with all suppliers equally, without preferential treatment

B) Suppliers should be regularly assessed for performance and quality

C) Suppliers must always provide the cheapest products

D) No supplier audits are necessary under ISO 9000

Answer: B) Suppliers should be regularly assessed for performance and quality

240. What does "corrective action" involve according to ISO 9000?

A) Identifying and eliminating the root cause of a nonconformity to prevent its recurrence

B) Ignoring the problem and moving forward with production

C) Only addressing customer complaints

D) Increasing production to compensate for defects

Answer: A) Identifying and eliminating the root cause of a nonconformity to prevent its recurrence

241. Which of the following describes "preventive action" in ISO 9000?

A) Taking steps to eliminate the root cause of potential nonconformities before they occur

B) Improving financial records

C) Reporting minor defects in products

D) Training employees to accept nonconformities

Answer: A) Taking steps to eliminate the root cause of potential nonconformities before they occur

242. How does ISO 9000 suggest organizations measure customer satisfaction?

A) By monitoring social media feedback

B) Through surveys, feedback, and customer complaints

C) By tracking the number of products sold

D) By maintaining a low product price

Answer: B) Through surveys, feedback, and customer complaints

243. What does the monitoring and measurement" principle in ISO 9000 refer to?

A) Monitoring financial data to improve profitability

B) Collecting data on customer complaints to reduce defects

C) Tracking the quality of processes and products to ensure they meet the standards

D) Reducing the number of staff working in the quality department

Answer: C) Tracking the quality of processes and products to ensure they meet the standards

244. Which of the following is a requirement for "document control" in ISO 9000?

A) Documents should be freely available to anyone

B) Documents should be reviewed and updated regularly to ensure their accuracy and relevance

C) Documents should be stored in a central physical file only

D) Documents should not be modified after they are created

Answer: B) Documents should be reviewed and updated regularly to ensure their accuracy and relevance

245. Which of the following is a primary benefit of ISO 9000 certification?

A) A boost in company reputation and customer trust

B) A decrease in the number of employees

C) A guarantee of no customer complaints

D) A reduction in operating costs

Answer: A) A boost in company reputation and customer trust

246. How does ISO 9000 recommend that organizations handle changes to the QMS?

A) Changes should be made spontaneously to keep up with new trends

B) Changes should be planned, documented, and communicated to all relevant parties

C) Changes should be ignored to maintain stability

D) Changes should only be made when required by the government

Answer: B) Changes should be planned, documented, and communicated to all relevant parties

247. What does ISO 9000 require regarding resource management?

A) Organizations must minimize resources to reduce costs

B) Organizations should ensure adequate resources are available to implement and maintain the QMS

C) Organizations should reduce employee numbers to save resources

D) Organizations should allocate all resources for production only

Answer: B) Organizations should ensure adequate resources are available to implement and maintain the QMS

248. What is the role of the "quality manual" in ISO 9000?

A) To document the financial strategies of the company

B) To define the overall quality management system and key processes

C) To store product designs

D) To track employee attendance

Answer: B) To define the overall quality management system and key processes

249. How should a company handle customer feedback in ISO 9000?

A) Ignore negative feedback and focus only on positive feedback

B) Collect, analyze, and use customer feedback to improve products and processes

C) Use customer feedback only for marketing purposes

D) Discard feedback that is not in line with company objectives

Answer: B) Collect, analyze, and use customer feedback to improve products and processes

b) First Aid and Fire Fighting

250. What is the primary purpose of a fire extinguisher?

A) To prevent fires

B) To detect fires

C) To extinguish fires

D) To alert authorities

Answer: C) To extinguish fires

251. Which class of fire involves electrical equipment?

A) Class A

B) Class B

C) Class C

D) Class D

Answer: C) Class C

252. Which type of fire extinguisher is suitable for electrical fires?

- A) Water B) CO₂ C) Foam D) Dry powder

Answer: B) CO₂

253. What does the acronym 'PASS' stand for in fire extinguisher operation?

- A) Pull, Aim, Squeeze, Sweep B) Push, Aim, Squeeze, Sweep
C) Pull, Aim, Squeeze, Spray D) Push, Aim, Squeeze, Spray

Answer: A) Pull, Aim, Squeeze, Sweep

254. Which of the following is a common cause of fires in railway stations?

- A) Overloaded electrical circuits B) Improper storage of flammable materials
C) Faulty wiring D) All of the above

Answer: D) All of the above

255. What is the minimum estimated cost for damage that triggers immediate reporting to the Railway Board?

- A) Rs. 100,000 B) Rs. 200,000 C) Rs. 300,000 D) Rs. 500,000

Answer: C) Rs. 300,000

256. Which of the following is a fire prevention measure in railway stations?

- A) Regular inspection of electrical equipment
B) Proper storage of flammable materials
C) Installation of fire detection systems
D) All of the above

Answer: D) All of the above

257. What should be regularly checked by the supervisor immediately after coming on duty?

- A) Fire fighting equipment and fire hydrants B) Train schedules
C) Ticketing systems D) Passenger lists

Answer: A) Fire fighting equipment and fire hydrants

258. Fires resulting in loss or damage worth Rs. 500 or more must be treated as what?

- A) Accidents requiring a formal inquiry B) Minor incidents
C) Routine occurrences D) None of the above

Answer: A) Accidents requiring a formal inquiry

259. Who should the Divisional Fire Inspector advise for training in fire fighting?

- A) The staff of the Electrical Department
B) The staff of the Mechanical Department

C) The staff of the Civil Engineering Department
D) The staff of the Commercial Department
Answer: A) The staff of the Electrical Department

260. What type of extinguisher is NOT used on electrical fires?
A) CO₂ B) Dry Powder C) Water D) Foam
Answer: C) Water

261. What is the main danger in using a water extinguisher on live electrical equipment?
A) Explosion B) Electric shock C) Fire spread D) Rust
Answer: B) Electric shock

262. Who should be informed first in case of a fire incident on a train?
A) Ticket checker B) Train driver C) Guard D) Control room
Answer: C) Guard

263. Which railway department ensures compliance with fire safety rules?
A) Traffic Department B) Civil Engineering
C) Safety Department D) Signaling Department
Answer: C) Safety Department

264. Which type of fire extinguisher is used for Class A fires?
A) CO₂ B) Water C) Foam D) Dry powder
Answer: B) Water

265. What is the primary purpose of first aid in the railway context?
A) To provide long-term medical treatment
B) To stabilize the condition of the injured until professional medical help arrives
C) To diagnose the medical condition
D) To perform surgical procedures
Answer: B) To stabilize the condition of the injured until professional medical help arrives

266. Which of the following is NOT a component of the primary survey in first aid?
A) Airway B) Breathing
C) Circulation D) Diagnosis
Answer: D) Diagnosis

267. In case of a severe bleeding wound, what is the first step to control the bleeding?
A) Apply a tourniquet B) Apply direct pressure to the wound
C) Clean the wound with water D) Elevate the injured limb
Answer: B) Apply direct pressure to the wound

- 268.** What should be the first action when approaching an unconscious casualty?
- A) Check for breathing
 - B) Check for a pulse
 - C) Shake the casualty and shout
 - D) Call for medical assistance

Answer: C) Shake the casualty and shout

- 269.** Which of the following is a sign of shock?
- A) Warm, dry skin
 - B) Rapid, weak pulse
 - C) Normal breathing
 - D) Clear consciousness

Answer: B) Rapid, weak pulse

- 270.** What is the correct ratio of chest compressions to rescue breaths in CPR for adults?
- A) 15:2
 - B) 30:2
 - C) 30:5
 - D) 15:5

Answer: B) 30:2

- 271.** Which of the following is NOT included in the contents of a standard railway first aid kit?
- A) Bandages
 - B) Antiseptic solution
 - C) Surgical instruments
 - D) Pain relief medication

Answer: C) Surgical instruments

- 272.** Where should the first aid kit be stored on a train?
- A) In the driver's cabin
 - B) In the guard's compartment
 - C) In a designated, easily accessible location
 - D) In the station master's office
- Answer: C) In a designated, easily accessible location

- 273.** What is the recommended action if a passenger is found unresponsive but breathing?
- A) Perform CPR immediately
 - B) Place the passenger in the recovery position
 - C) Administer water
 - D) Shake the passenger to wake them up

Answer: B) Place the passenger in the recovery position

- 274.** In case of a burn injury, what is the first step in first aid?
- A) Apply ice directly to the burn
 - B) Apply a burn ointment
 - C) Cool the burn under running cold water
 - D) Cover the burn with a dry cloth
- Answer: C) Cool the burn under running cold water

275. What should be done if a person is choking and unable to cough or speak?

- A) Perform the Heimlich maneuver
- B) Slap the person's back
- C) Give the person water
- D) Wait for the person to cough

Answer: A) Perform the Heimlich maneuver

276. Which of the following is a symptom of hypothermia?

- A) Shivering
- B) High body temperature
- C) Rapid breathing
- D) Sweating

Answer: A) Shivering

277. What is the first step in treating a fracture?

- A) Apply a splint
- B) Move the person to a comfortable position
- C) Immobilize the injured area
- D) Apply ice to the injury

Answer: C) Immobilize the injured area

278. How often should railway staff be trained in first aid procedures?

- A) Once every five years
- B) Once every two years
- C) Annually
- D) Only during emergencies

Answer: C) Annually

279. Which of the following is a key responsibility of railway staff regarding first aid?

- A) Diagnosing medical conditions
- B) Providing long-term medical care
- C) Administering first aid and seeking professional medical help
- D) Performing surgeries

Answer: C) Administering first aid and seeking professional medical help

280. What is the correct procedure for handling a suspected spinal injury?

- A) Move the person to a comfortable position
- B) Apply a cervical collar and keep the person still
- C) Allow the person to move their head
- D) Apply ice to the neck area

Answer: B) Apply a cervical collar and keep the person still

281. In case of a heart attack, what is the immediate first aid action?

- A) Perform CPR
- B) Give the person aspirin if they are not allergic
- C) Apply a cold compress to the chest
- D) Allow the person to walk around

Answer: B) Give the person aspirin if they are not allergic

282. What is the primary goal of first aid in the railway setting?

- A) To replace professional medical treatment
- B) To provide immediate care to prevent the condition from worsening

C) To diagnose the medical condition

D) To perform surgical procedures

Answer: B) To provide immediate care to prevent the condition from worsening

283. Which of the following is a common cause of injuries in the railway environment?

A) Slips, trips, and falls

B) Exposure to extreme temperatures

C) Contact with moving trains

D) All of the above

Answer: D) All of the above

284. What should railway staff do if they are unsure about how to handle a medical emergency?

A) Attempt to provide treatment based on assumptions

B) Wait for medical professionals to arrive

C) Call for professional medical assistance immediately

D) Ignore the situation

Answer: C) Call for professional medical assistance immediately

c) Stores Procedures, Budget and Accounts

285. Emergency stores should never be classified as -----

(a) Overstock

(b) Inactive

(c) Surplus Stores

(d) All the above

Ans: (d)

286. Surplus stores are those stores which are not issued for -----

(a) 36 months

(b) 12 months

(c) 18 months

(d) 24 months

Ans: (d)

287. Inventory Turn Over Ratio is calculated for -----

(a) Without Fuel

(b) With Fuel

(c) With and without Fuel

(d) None of the above

Ans: (c)

288. PL number is -----

(a) 6 Digits

- (b) 8 Digits
- (c) 10 Digits
- (d) 12 Digits

Ans: (b)

289. ABC analysis is also called -----

- (a) Value analysis
- (b) Volume analysis
- (c) Value Volume
- (d) None of the above

Ans: (c)

290. Which of the following is correct regarding the sanction of M&P?

- (e) PCME can sanction items costing more than Rs.50 Lakhs
- (f) Zonal Railways can sanction Road vehicles under M&P
- (g) Two Wheelers sanction is out of GM's Powers
- (h) SAG Officer has the power to sanction M&P Items costing up to Rs.20 Lakhs

Ans: (d)

291. Which of the following is not the role of COFMOW

- (a) Procurement of M&P items costing above Rs.30 Lakh
- (b) Preparing specifications for M&P
- (c) Circulating cost compendium to Zonal Railways
- (d) Procurement of Road Vehicles

Ans: (d)

292. Which of the following are not correct regarding finance concurrence/vetting of M&P items

- (a) Vetting of Detailed Estimate for items sanctioned under M & P
- (b) Vetting of NS Indents for the items sanctioned under M & P
- (c) Accord concurrence for M&P proposals costing above Rs.10 Lakhs
- (d) Vetting of the Revised Estimates due to cost escalation and other than Cost Escalation

Ans: (b)

293. Which of the following can be procured under the Bulk Rolling Stock Programme?

- (a) Coaches
- (b) Wagons
- (c) Locos
- (d) All the above

Ans: (d)

294. For which of the following Plan Heads, the Mechanical Department is not the nodal department?

- (a) PH 4100
- (b) PH 5300
- (c) PH 2100
- (d) PH 4200

Ans: (b)

295. Which of the following statements are correct regarding the proposal/sanction of the RSP items?

- I. Items under Bulk RSP need to be proposed at Zonal Railways.
- II. Items under itemized RSP require the sanction of General Manager
- III. Items under ItemisedRSP to be proposed by the Zonal Railways.

- (a) I only
- (b) III only
- (c) I & III only
- (d) II only

Ans: (b)

296. The work in a Stores Depot consists of -----

- (a) Receipts and Inspection of Stores
- (b) Storage and Issue of Materials
- (c) Dispatch of Materials
- (d) All of the above

Ans: (d)

297. Major Works in Receipt section -----

- (a) Receipt of Materials
- (b) Account of Materials
- (c) Dealing of Rejections
- (d) All of the above

Ans: (d)

298. Various types of Issues in Ward and posting of Issue Vouchers is -----

- (a) Through Ordinary or Regular issues
- (b) Through Book Transfer Issues
- (c) Through Imprest Issues
- (d) All of the above

Ans: (d)

299. All shelf life items are required to be issued -----

- (a) At one go
- (b) First in First out - FIFO

- (c) Last in First Out
- (d) None of the above

Ans: (b)

300. UDM stands for

- (a) UserDepot Module
- (b) Using Depot Machine
- (c) User Development Module
- (d) None of the above

Ans: (a)

301. What can be done in UDM -----

- (a) Creation of Computerised Ledgers
- (b) Receipt of Materials
- (c) Issue of Materials to Different stakeholders
- (d) All of the above

Ans: (d)

302. What are the intended benefits of UDM -----

- (a) Computerization of the entire supply chain
- (b) Optimization of Material Procurement leading to cost reduction and economy
- (c) Traceability of material usage leading to improved Asset maintenance
- (d) All of the above

Ans: (d)

303. What are the capabilities of UDM -----

- (a) Creation of Computerized ledgers
- (b) Receipt of Materials from other Railways
- (c) Receipt of Materials from unconnected Receipts
- (d) All of the above

Ans: (d)

304. What does TOR imply -----

- (a) TurnOver Ratio
- (b) TurningOver Ration
- (c) Test of Ratio
- (d) None of the above

Ans: (a)

305. Functions of Ledger Section -----

- (a) Critical scrutiny and processing of Demands and Opening of New headings
- (b) Prompt submission of updated monthly consumption to the Hqrs

- (c) To alert the Hqrs in case of any shortfall in item quantity
- (d) All of the above.

Ans: (d)

306. Yardsticks of measurement of work in CLW pattern of Incentive Scheme

- (a) Standard Production Unit
- (b) Time
- (c) SCN Coach
- (d) BOXN Wagon

Ans: (b)

307. The yardstick of measurement of work in Group Incentive scheme

- (a) Standard Production Unit
- (b) Time
- (c) SCN Coach
- (d) BOXN Wagon

Ans: (a)

308. Minimum percentage of Incentive Bonus in case of CLW pattern incentive scheme

- (a) 10 %
- (b) 20 %
- (c) 33.33 %
- (d) 50 %

Ans:

(c)

309. Minimum percentage of Incentive Bonus in case of Group Incentive Scheme

- (a) 10 %
- (b) 20 %
- (c) 33.33 %
- (d) 50%

Ans: (b)

310. Maximum percentage of Incentive Bonus in case of CLW pattern incentive scheme

- (a) 10%
- (b) 20 %
- (c) 33.33 %
- (d) 50 %

Ans: (d)

311. Maximum percentage of Incentive Bonus in case of Group Incentive Scheme

- (a) 10 %
- (b) 20 %
- (c) 33.33 %

(d) 50 %

Ans: (d)

312. Frequency of Accounts Stock Verification of A Category items in Stores Depots

- (a) 1 year
- (b) 2 years
- (c) 3 years
- (d) 6 months

Ans: (d)

313. Frequency of Accounts Stock verification of Revenue stores in Open Line units

- (a) 1 year
- (b) 2 years
- (c) 3 years
- (d) 6 months

Ans: (b)

314. Stock Sheet is prepared by ASV in -----

- (a) Duplicate
- (b) Triplicate
- (c) Singlecopy
- (d) None of the above

Ans: (b)

315. Accounts Stock verification is in Chapter 32 of -----

- (a) Accounts Code
- (b) Stock Verification Manual
- (c) Stores Code
- (d) Engineering Code

Ans: (c)

316. Stores in Stock A/c and Purchase Suspense A/c always shows respectively

- (a) Debit Balance & Credit Balance
- (b) Credit Balance & Credit Balance
- (c) Debit Balance & Debit Balance
- (d) Credit Balance & Debit Balance

Ans: (a)

317. The receiving depot receives the vouchers but the actual material has still not reached the depot from the Issuing Depot due to a delay in transit. In such case the receiving depot Depot operates a temporary suspense account called -----

- (a) Purchase Suspense A/c
- (b) Stock Adjustment A/c

- (c) Stores in Transit A/c
- (d) Stores in Stock A/c

Ans: (c)

318. During the process of Scrap Sales, the following Suspense Head is operated in RailwayBooks

- (a) Purchase Suspense A/c
- (b) Sales Suspense A/c
- (c) Stores in Transit A/c
- (d) Demands Recoverable A/c

Ans: (b)

319. Which one of the following Suspense Head is not operated for Stores Transactions under erstwhile Demand No.16

- (a) Sales Suspense
- (b) Purchase Suspense
- (c) MAC - Miscellaneous Advance Capital
- (d) Labour Suspense

Ans: (d)

320. _____ is the basis for claiming payment by Supplier for supply of the material

- (a) Issue Note
- (b) Receipt Note
- (c) Debit Note
- (d) Credit Note

Ans: (b)

321. If AAC is 3600 Nos, then monthly requirement is -----

- (a) 100
- (b) 200
- (c) 300
- (d) 400

Ans: (c)

322. Pre-check / vetting of Purchase Order required for the value above Rs (other than Safety & Passenger Amenities)

- (a) 8 Lakh
- (b) 7 Lakh
- (c) 6 Lakh
- (d) 5 Lakh

Ans: (a)

323. CRAC in GeM means -----

- (a) Central Receipt & Acceptance Certificate

- (b) Central Railway Acceptance Certificate
- (c) Consignee Receipt & Acceptance Certificate
- (d) Central Receipt & Accounting Certificate

Ans: (c)

324. Dy. CMM at Hqrs can accept Tender committee recommendation for purchase of items valuing up to -----

- (a) Rs. 25 Lakhs
- (b) Rs. 50 Lakhs
- (c) Rs. 50 Lakhs to Rs.1 Crore
- (d) Rs. 1 Crore to Rs. 10 Crores

Ans: (c)

325. Track fittings are purchased by _____ Department

- (a) Stores
- (b) Mechanical
- (c) Engineering
- (d) Operating

Ans: (a)

326. The Direct control over the affairs of all the Workshops including the Budgetary control in a Zonal Railway rest with -----

- (a) Chief Planning Engineer - CPE
- (b) Chief Rolling Stock Engineer - CRSE
- (c) Chief Motive Power Engineer - CMPE
- (d) Cheif Workshop Engineer – CWE

Ans: (d)

327. Technical control over the Carriage and Wagon maintenance of activities in all depots, yards, and open line in zonal Railways rest with -----

- (a) Chief Planning Engineer - CPE
- (b) Chief Rolling Stock Engineer - CRSE
- (c) Chief Motive Power Engineer - CMPE
- (d) Cheif Workshop Engineer – CWE

Ans: (b)

328. The Direct control of the affairs of a Railway Workshop is exercised by -----

- (a) Chief Planning Engineer - CPE
- (b) Chief Rolling Stock Engineer - CRSE
- (c) Chief Motive Power Engineer - CMPE
- (d) Cheif Workshop Engineer – CWE

Ans: (d)

329. Construction and assembling of Rolling Stock, Manufacturing of Components, Repair & maintenance works related to the Rolling stock of other Govt depts and private bodies is done at -----
- (a) Zonal Railway Workshops
 - (b) Production Units of IR
 - (c) PSUs - Public Sector Undertakings of Central Govt.
 - (d) Public Limited Companies

Ans: (a)

330. The efficiency of Railway workshop activities is dependent on the functions of
- (a) PCO- Production Control Organisation
 - (b) ERP Management
 - (c) Progress Office
 - (d) Time Office

Ans: (a)

331. Drawing, Planning, Processing, Rate Fixing, Production Control, Progress, Inspection & quality control are the functions of
- (a) PCO- Production Control Organisation
 - (b) ERP Management
 - (c) Progress Office
 - (d) Time Office

Ans: (a)

332. The purpose of arriving the unit cost of Rolling Stock in IR Production Units is to arrive the decisions on -----
- (a) acquisition of Rolling Stock
 - (b) maintenance of Rolling Stock
 - (c) Selling of Rolling Stock
 - (d) Leasing of Rolling Stock

Ans: (c)

333. Railway Production Units engaged in Rolling Stock manufacturing activity will adopt - costing system
- (a) Process
 - (b) Batch
 - (c) Job Order
 - (d) Standard

Ans: (b)

334. In Production Units, expenses related to GM Office including electricity charges and diet charges are known as -----
- (a) Factory Overheads

- (b) Administrative Overheads
- (c) Township Overheads
- (d) Inventory Overheads

Ans: (b)

d) Official Language Policy and Official Language Rules

335. What is the Official Language of the Union of India
A)Hindi in Devanagari Script
B) English Script
C)Bengali Script
D)Kashmir
336. Which form of numerals are to be used for official purposes of the Union
A)Roman Numeral
B) International form of Indian numerals
C) Devanagari Numerals
D)Regional Numeral
337. Which part of the Constitution contains provisions regarding Official Language?
a. Part XV
b. Part XVI
c. Part XVII
d. Part XVIII
338. On which date Part XVII of the Constitution was passed in Parliament?
a. August 10, 1949
b. 14.09.1949
c. October 10, 1949
d. November 10, 1949
339. How many chapters are there in Part XVII of the Constitution?
a. 4 Chapters
b. 3 Chapters
c. 2 Chapters
d. 8 Chapters

340. How many articles are there in Part XVII of the Constitution?
- a. **9 Articles**
 - b. 2 Articles
 - c. 7 Articles
 - d. 1 Articles
341. What are all the nine Articles covered under Part XVII of the Constitution?
- a. Articles 340-348
 - b. **Articles 343-351**
 - c. Articles 345-353
 - d. Articles 350-358
342. In which part and in which article of the constitution the provision regarding the language to be used for Transaction of business in Parliament exists?
- a. Part V, Article 110
 - b. Part V, Article 115
 - c. **Part V, Article 120**
 - d. Part XVII, Article 348
343. In which part and in which article of the constitution the provision regarding the language to be used for the transaction of business in State Legislatures exists?
- a. Part V, Article 120
 - b. Part VI, Article 200
 - c. **Part VI, Article 210**
 - d. Part XVII, Article 348
344. Which article of the constitution contains a provision regarding the language to be used in courts etc.?
- a. Article 120
 - b. Article 210
 - c. Article 343
 - d. **Article 348 & 349**
345. Which article of the constitution contains a provision regarding the official language of the Union of India?
- a. Article 120
 - b. Article 210
 - c. **Article 343 & 344**

- d. Article 348
346. Which article of the constitution contains a provision regarding the official language of States?
- a. Article 343
 - b. Article 345**
 - c. Article 348
 - d. Article 350
347. As per Article 343(1) of the constitution when Hindi became the official language of the Union of India?
- a. January 26, 1950
 - b. January 26, 1965**
 - c. August 15, 1947
 - d. January 1, 1970
348. Name the articles of the constitution which in their provisions contain a reference to the Eighth Schedule of the constitution?
- a. Articles 120 and 210
 - b. Articles 343 and 348
 - c. Articles 344(1) and 351**
 - d. Articles 345 and 350
349. In which part of the constitution are the articles 343-351, that gives information about Official Language available?
- a. Part V
 - b. Part VI
 - c. Part XI
 - d. Part XVII**
350. At present how many languages are enlisted in the Eighth Schedule of the Constitution?
- a. 18
 - b. 20
 - c. 22**
 - d. 25

351. When the Constitution was adopted, how many languages were included in the Eighth Schedule initially?
- a. **Fourteen**
 - b. Seventeen
 - c. Twelve
 - d. D) Sixteen
352. In which year Maithili, Bodo, Dogri and Santhali were added to the Eighth Schedule later?
- a. 2005
 - b. **2003**
 - c. 2012
 - d. 2002
353. In which year Sindhi was added to the Eighth Schedule?
- a. 1956
 - b. 1965
 - c. **1967**
 - d. 1981
354. In which year Nepali, Konkani & Manipuri were added to the 8th Schedule?
- a. 1995
 - b. 1989
 - c. 1988
 - d. **1992**
355. Which one is the foreign language included in the 8th Schedule?
- a. **Nepali**
 - b. Bangladesh
 - c. Sri Lanka
 - d. Sindhi
356. Which is the Official Language of Arunachal Pradesh?
- a. Telugu
 - b. **English**
 - c. Marathi
 - d. Hindi

357. When was the Official Language Act 1963 passed?
a. **10.05.1963**
b. 09.3.1965
c. 02.08.1988
d. 11.11.1971
358. When did section 3(3) of the Official Language Act take effect?
a. 24 March 1965
b. 22 September 1932
c. **26 January 1965**
d. 25 May 1970
359. When was the Official Language Act, 1963 was amended?
a. **1967**
b. 1965
c. 1955
d. 1985
360. How many sections are there in the Official Language Act 1963, as amended in the year 1967?
a. 10 Sections
b. 8 sections
c. 3 Sections
d. **9 Sections**
361. With which section 7 of Official Language Act, 1963 is concerned?
a. Powers of President
b. **Continued use of English for certain purposes**
c. Language for High Courts
d. Duties of Union Government
362. Why was the Official Languages Act 1963 passed?
a. To make Hindi the sole official language
b. **To provide for the continued use of English for official purposes**
c. To promote regional languages
d. To abolish English language
363. When was the Resolution on Official Language passed by Parliament?
a. January 18, 1965

- b. January 18, 1968**
 - c. January 26, 1950
 - d. August 15, 1947
- 364. When were Official Languages Rules passed?
 - a. 1963
 - b. 1968
 - c. 1975
 - d. 1976**
- 365. What is the primary purpose of Discipline and Appeal Rules?
 - A) To punish employees
 - B) To maintain discipline and ensure accountability**
 - C) To promote employees
 - D) To fix salary
- 366. Which of the following is a type of misconduct?
 - A) Good performance
 - B) Unauthorized absence**
 - C) Teamwork
 - D) Punctuality
- 367. What is the purpose of an appeal under Discipline and Appeal Rules?
 - A) To punish employees
 - B) To provide a fair hearing and redress grievances**
 - C) To promote employees
 - D) To fix salaries
- 368. Who is authorized to impose penalties under Discipline and Appeal Rules?
 - A) Any employee
 - B) Disciplinary authority**
 - C) Union representative
 - D) Customer
- 369. What is the difference between a minor penalty and a major penalty?
 - A) Minor penalty is more severe
 - B) Minor penalty is less severe, while major penalty is more severe**
 - C) Both are the same
 - D) None of the above

370. Which of the following is a minor penalty?
- A) Dismissal
 - B) Censure**
 - C) Removal
 - D) Compulsory retirement
371. What is the purpose of a show-cause notice?
- A) To inform employees of promotions
 - B) To inform employees of alleged misconduct and seek explanation**
 - C) To fix salaries
 - D) To provide training
372. Who can file an appeal under Discipline and Appeal Rules?
- A) Any employee
 - B) Aggrieved employee**
 - C) Disciplinary authority
 - D) Union representative
373. What is the time limit for filing an appeal under Discipline and Appeal Rules?
- A) 30 days
 - B) As specified in the rules or regulations**
 - C) 60 days
 - D) 90 days
374. What is the role of the appellate authority?
- A) To impose penalties
 - B) To review the decision of the disciplinary authority**
 - C) To investigate misconduct
 - D) To provide training
375. Which of the following is a type of disciplinary action?
- A) Promotion
 - B) Suspension**
 - C) Transfer
 - D) Training
376. What is the purpose of a disciplinary inquiry?
- A) To punish employees
 - B) To investigate alleged misconduct and determine guilt**
 - C) To promote employees
 - D) To fix salaries

377. Who can conduct a disciplinary inquiry?
- A) Any employee
 - B) Inquiry officer or disciplinary authority**
 - C) Union representative
 - D) Customer
378. What is the purpose of a charge sheet?
- A) To inform employees of promotions
 - B) To inform employees of alleged misconduct and seek explanation**
 - C) To fix salaries
 - D) To provide training
379. Which of the following is a major penalty?
- A) Censure
 - B) Removal**
 - C) Suspension
 - D) Warning
380. What is the role of the disciplinary authority in disciplinary proceedings?
- A) To investigate misconduct
 - B) To impose penalties and ensure accountability**
 - C) To provide training
 - D) To promote employees
381. Which of the following is a principle of disciplinary proceedings?
- A) Bias
 - B) Fairness and impartiality**
 - C) Punishment without reason
 - D) None of the above
382. What is the purpose of an appeal hearing?
- A) To punish employees
 - B) To provide a fair hearing and redress grievances**
 - C) To promote employees
 - D) To fix salaries
383. Who can represent an employee in a disciplinary inquiry?
- A) Any employee
 - B) Defense representative or union representative**
 - C) Disciplinary authority
 - D) Customer

384. What is the significance of timelines in disciplinary proceedings?

- A) To delay proceedings
- B) To ensure timely resolution and fairness**
- C) To punish employees
- D) To promote employees

385. An appeal submitted after the due date may be:

- a) Automatically rejected
- b) Referred to court
- c) Accepted with justification**
- d) Forwarded to Inquiry Officer

386. During inquiry, a government servant is given:

- a) No chance to defend
- b) Only written representation
- c) Opportunity to cross-examine witnesses**
- d) Retirement benefits

387. The first stage advice of CVC is sought:

- a) Before issue of charge sheet**
- b) After penalty
- c) Before suspension
- d) After appeal

388. When can a major penalty be imposed without inquiry?

- a) On minor misconduct
- b) When employee admits guilt**
- c) Never
- d) If department decides

389. Inquiry officer must submit the report to:

- a) Appellate authority
- b) Presenting officer
- c) Complainant
- d) Disciplinary authority**

390. Can a government servant withdraw his appeal?

- a) No
- b) Yes, with approval**
- c) Yes, anytime

d) Only during inquiry

391. Penalty must be imposed by:

- a) Any officer
- b) Vigilance
- c) Disciplinary authority**
- d) Court

392. Suspension can be extended:

- a) Indefinitely
- b) By court order
- c) With review and reasons**
- d) On employee's request

393. When was Official Languages Rules amended?

- a. 1965
- b. 1987**
- c. 1970
- d. 1975

394. Into how many Regions Indian states have been classified, according to Official Languages Rules?

- a. 1965
- b. 1987**
- c. 1970
- d. 1975

395. What are all the 3 Regions as classified under Official Languages Rules?

- a. 10 States, 2 Union Territory**
- b. 9 States, 3 Union Territories
- c. 11 States, 1 Union Territory
- d. 8 States, 4 Union Territories

396. How many States and Union Territories are there in Region 'A'?

- a. 8 States, 4 Union Territories
- b. 11 States, 1 Union Territory
- c. 9 States, 3 Union Territories**
- d. 10 States, 2 Union Territories

397. When is "Hindi Day" celebrated every year?

- a. **14th September**
 - b. 15th October
 - c. 6th August
 - d. 17th June
398. Which are the states that come under Region 'A'?
- a. Assam, Bihar, Chhattisgarh, Jharkhand, Uttar Pradesh, Uttarakhand,
 - b. Haryana, Himachal Pradesh, Rajasthan, Madhya Pradesh
 - c. Gujarat, Maharashtra, Goa, Daman and Diu, Dadra and Nagar Haveli
 - d. **Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Jharkhand, Madhya Pradesh, Rajasthan, Uttar Pradesh, Uttarakhand**
 - e. Kerala, Tamil Nadu, Karnataka, Andhra Pradesh
399. 637. Which are the states that come under Region 'B'?
- a. **Assam, Meghalaya, Manipur, Mizoram, Nagaland, Arunachal Pradesh, Tripura**
 - b. Gujarat, Maharashtra, Goa, Daman and Diu, Dadra and Nagar Haveli
 - c. Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Jharkhand,
 - d. Madhya Pradesh, Rajasthan, Uttar Pradesh, Uttarakhand
 - e. Kerala, Tamil Nadu, Karnataka, Andhra Pradesh
400. Which are the states that come under Region 'C'?
- a. **Assam, Meghalaya, Manipur, Mizoram, Nagaland, Arunachal Pradesh, Tripura**
 - b. Gujarat, Maharashtra, Goa, Daman and Diu, Dadra and Nagar Haveli
 - c. Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Jharkhand
 - d. Madhya Pradesh, Rajasthan, Uttar Pradesh, Uttarakhand
 - e. Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Telangana, Puducherry
401. Who is responsible for the compliance of provisions of the Official Languages Act and rules?
- a. Department of Official Language
 - b. Ministry of Home Affairs
 - c. **Union Government, State Governments, and Union Territory Administrations**
 - d. Parliament of India
402. Which Ministry takes important decisions pertaining to Official Language?
- a. Ministry of Education

- b. Ministry of Culture
 - c. Ministry of Home Affairs**
 - d. Ministry of Information and Broadcasting
403. According to Official Languages Rules, Tamilnadu falls under which region?
- a. Region A
 - b. Region B
 - c. Region C**
 - d. Region D
404. According to Official Languages Rules, Andaman & Nicobar Islands fall under which region?
- a. Region A
 - b. Region B**
 - c. Region C
 - d. Region D
405. Which are the Union Territories classified under Region "B"?
- a. Delhi, Chandigarh, Dadra and Nagar Haveli and Daman and Diu
 - b. Andaman and Nicobar Islands, Puducherry**
 - c. Lakshadweep, Jammu and Kashmir, Ladakh
 - d. None of the above
406. States in which Urdu has been declared as one of the Official Language?
- a. Bihar, Jharkhand, and West Bengal
 - b. Andhra Pradesh, Telangana, and Uttar Pradesh
 - c. Andhra Pradesh, Telangana, Jharkhand, Bihar, and Uttar Pradesh**
 - d. Gujarat, Maharashtra, and Karnataka
407. Who was the Chairman of the First Official Language Commission?
- a. Jawaharlal Nehru
 - b. B.G. Kher**
 - c. Rajendra Prasad
 - d. Morarji Desai
408. Who was the First Chairman of the Committee Which was formed on the recommendation of the Official Language Commission?
- a. Jawaharlal Nehru
 - b. Morarji Desai

- c. **B.G. Kher**
 - d. Rajendra Prasad
409. Who was the First Chairman of the Parliamentary Committee on Official Language constituted in the year 1976?
- a. **Om Mehta**
 - b. Morarji Desai
 - c. B.G. Kher
 - d. Rajendra Prasad
410. Who chaired the First Railway Hindi Salahkar Samiti constituted in 1973?
- a. **Lalit Narayan Mishra**
 - b. Morarji Desai
 - c. B.G. Kher
 - d. Jagjivan Ram
411. As per the Constitution, who is translating the Statutory Rules, Regulations and Orders?
- a. The President of India
 - b. **The Union Government**
 - c. The State Governments
 - d. The Supreme Court of India
412. Which was the Main Language and Co-Official Language used for the Official Purpose of the Union of India up to 1965?
- a. Hindi and English
 - b. **Hindi (Main) and English (Co-Official)**
 - c. English and Hindi
 - d. Sanskrit and English
413. Which Committee of the Committee on Parliament on Official Language prepared the Draft?
- a. First Committee
 - b. B) Second Committee
 - c. **Third Committee (B.G. Kher Committee's recommendations led to formation of Committee under Morarji Desai)**
 - d. Fourth Committee
414. In which year the post of Hindi Assistant was created in Railway Board in compliance of President's order?

- a. 1947
 - b. 1950
 - c. 1957**
 - d. 1965
415. In which year, Hindi (Parliament) Section was established in Railway Board?
- a. 1960**
 - b. 1955
 - c. 1957
 - d. 1965
416. In which year, the Hindi Translation of Railway Budget was prepared and who was the Railway Minister?
- a. 1955, Jawaharlal Nehru
 - b. 1956, Lal Bahadur Shastri**
 - c. 1960, Morarji Desai
 - d. 1965, Indira Gandhi
417. Angami is a language of Goa
- a. Nagaland
 - b. Assam**
 - c. Bihar
 - d. Manipur
418. How many languages and dialects are spoken by people all over the world?
- a. 9000
 - b. 6000**
 - c. None
 - d. 4000
419. Committee on Official Language shall consist _____members of the council of States
- a. Thirty**
 - b. Ten
 - c. Hundred
 - d. Twenty
420. Which of the following are the languages of Pondicherry?
- a. Tamil, Telugu, Malayalam
 - b. French, English
 - c. All of the above**

- d. None of the above
- 421. Highest speaking language in India after Hindi is
 - a. Bengali
 - b. Telugu**
 - c. Marathi
 - d. Tamil
- 422. The provisions related to official language of India can be amended by
 - a. Simple Majority
 - b. Special Majority
 - c. Presidential Order
 - d. Constitutional Amendment**
- 423. Lepcha is a language of
 - a. Sikkim**
 - b. Nagaland
 - c. Tripura
 - d. Andhra Pradesh
- 424. Name the language that is widely spoken by the people residing in Assam
 - a. Gujarati
 - b. Punjabi
 - c. .English
 - d. Assamese**
- 425. Which one of the following languages is not spoken in Sikkim?
 - a. Bhutia
 - b. None of these**
 - c. Lepcha
 - d. Punjabi
- 426. Sherdukpen is a language of
 - a. Bihar
 - b. Haryana
 - c. Arunachal Pradesh**
 - d. West Bengal
- 427. What is the additional official language of Uttarakhand?
 - a. Garhwal
 - b. Sanskrit**
 - c. Kumaoni
 - d. Hindi
- 428. Approximately, how many people speak Chinese language?

- a. 1 million
 - b. 1 billion**
 - c. 1 thousand
 - d. 1 lakh
429. LIPI/Script of Hindi Language is
- a. Sanskrit
 - b. Devanagari**
 - c. Urdu
 - d. Gurumukhi
430. In which language vande matram was written?
- a. Marathi
 - b. Bengali
 - c. Hindi
 - d. Sanskrit**
431. English is the official language of which one of the following Indian States ?
- a. Assam
 - b. Tripura
 - c. Nagaland**
 - d. Manipur
432. Arrange languages in Ascending order of Highest Speaking Language:
- a. Spanish, English, Russian, Chinese
 - b. Bengali, French, English, Chinese
 - c. Arabic, English, Spanish, Chinese
 - d. Arabic, Spanish, English, Chinese**
433. When Haryana was formed in 1966, _____ was declared as the second official language of the State by Bansi Lal Govt
- a. Punjabi
 - b. Telugu
 - c. Tamil**
 - d. Hindi
434. Which one of the following languages is not widely spoken in Tripura?
- a. English
 - b. Bengali
 - c. Hindi
 - d. Tripuri**
435. Sanskrit is official language of the state
- a. Madhya Pradesh
 - b. Uttarakhand**

- c. Himachal Pradesh
 - d. Karnataka
436. Apotnaji is a language of
- a. Sikkim
 - b. West Bengal
 - c. Kerala
 - d. Arunachal Pradesh**
437. The language spoken in Lakshadweep islands is
- a. Marathi
 - b. Tamil
 - c. Malayalam**
 - d. Gujarati
438. While Hindi is the official language, English has been permitted for official use
- a. till 1995
 - b. till 2001
 - c. till 2010
 - d. Indefinitely**
439. Which of the following is the official language of Jammu and Kashmir?
- a. Kannada, Malayalam and Telugu
 - b. Farsi, Urdu and Hindi
 - c. Urdu, Hindi and Kashmir**
 - d. Bengali, Hindi and English
440. The only religious book ever printed in a shorthand scripts is
- a. Bible**
 - b. Ramayan
 - c. Kuran
 - d. Geeta
441. The oldest Indian language is
- a. Tamil**
 - b. Telugu
 - c. Punjabi
 - d. Hindi
442. When was the first time 'World Hindi Day' is observed?
- a. 1975
 - b. 2006**
 - c. 2011

- d. 2015
443. According to Annual Programme, in which order Advertisement (Tender Notice etc.) of Central Offices are to be published in News Papers?
- a. **English, Hindi, Regional Language, Other Language**
 - b. Hindi, English, Regional Language, Other Language
 - c. Regional Language, Hindi, English, Other Language
 - d. other Language, Regional Language, Hindi, English
444. Konkani is the official language of _____.
- a. Andhra Pradesh
 - b. Arunachal Pradesh
 - c. West Bengal
 - d. **Goa...**
445. Which of these languages is generally not spoken in Southern part of India?
- a. Telugu
 - b. Konkan...
 - c. **Maithili**
 - d. Malayalam...
446. Urdu is the official language of .
- a. Andhra Pradesh
 - b. Arunachal Pradesh
 - c. West Bengal
 - d. **Jammu kashmir**
447. Malayalam is the official language of
- a. Puducherry
 - b. **Lakshadweep**
 - c. Daman and Diu
 - d. Delhi
448. Dzongkha is the official Language of
- a. Indonesia
 - b. Cambodia
 - c. **Bhutan**
 - d. Myanmar.
449. Telugu is the official language of _____.

- a. **Andhra Pradesh**
 - b. Arunachal Pradesh
 - c. Assam
 - d. Bihar
450. Ramcharitmanas is an epic poem written in which language?
- a. Santali
 - b. Munda
 - c. **Awadhi**
 - d. Sanskrit
451. How many languages are officially recognized in India?
- a. 17
 - b. 19
 - c. **22**
 - d. 10
452. Who among the following was the first grammarian of the Sanskrit language?
- a. Kalhana
 - b. Maitreyi
 - c. Kalidasa
 - d. **Panini...**
453. Who will be the President of the Official Language Implementation Committee in the field offices? 'SELF LEARNING KIT' ON OFFICIAL LANGUAGE RULES & PROVISIONS
- a. **Head of the Department**
 - b. Administrative Head of the Office
 - c. Any Group Officer
 - d. Any Branch Officer
454. Who will be the Member-Secretary of the Official Language Implementation Committee in the field offices?
- a. Head of the Department
 - b. Administrative Head of the Office
 - c. Any Group Officer
 - d. **Hindi Officer**

455. Communications from a Central Government office to State or Union Territory in Region 'C' or to any office (not being a Central Government office) or person in such State shall be in
- a. English**
 - b. Hindi
 - c. Bilingual
 - d. the Language of State Concerned
456. Communications from a Central Government office to a State in Region 'A' or to any office (not being a Central Government office) or person shall (save in exceptional cases) be in
- a. English
 - b. Hindi**
 - c. Bilingual
 - d. the Language of State Concerned
457. Communications from a Central Government office to any person in a State or Union Territory of Region 'B' may be in .
- a. English
 - b. Hindi
 - c. Either Hindi or English**
 - d. the Language of State Concerned
458. Communications from a Central Government office in Region 'C' to a State or Union Territory of Region 'A' or Region 'B' or to any office (not being a Central Government office) or person in such State may be in
- a. English
 - b. Either in Hindi or English**
 - c. Hindi
 - d. the Language of State Concerned
459. Communications from a Central Government office in reply to communications in Hindi shall be in
- a. English
 - b. Hindi**
 - c. Bilingual
 - d. the Language of State Concerned
460. All documents referred to in sub-section (3) of section 3 of the OL Act shall be in

- a. English
 - b. Hindi
 - c. Both Hindi & English**
 - d. the Language of State Concerned
461. It shall be the responsibility of the persons..... to ensure the compliance of subsection (3) of section 3 of the OL Act 1963.
- a. (A) Signing such documents**
 - b. (B) Writing such documents
 - c. (C) Group Officer
 - d. (D) Hindi Officer
462. Where an employee desires any order or notice relating to service matters (including disciplinary proceedings) required to be served on him to be in Hindi, or as the case may be, in English, it shall be given to him in
- a. (A) English
 - b. (B) Both Hindi & English
 - c. (C) Hindi
 - d. (D) the desired Language**
463. Any Application, appeal or representation, when made or signed in Hindi, shall be replied to in
- a. English
 - b. Hindi**
 - c. Bilingual
 - d. The Language of State Concern
464. If any question arises as to whether a particular document is of a legal or technical nature, it shall be decided by the
- a. Head of the Department**
 - b. Group officer concerned
 - c. Branch Officer concerned
 - d. Hindi Officer
465. An employee shall be deemed to possess proficiency in Hindi if he has passed the Matriculation or any equivalent or higher examination with as the medium of examination.
- a. English
 - b. Hindi**

- c. Urdu
 - d. The Language of State Concerned
466. An employee shall also be deemed to possess proficiency in Hindi if he has taken as an elective subject in the degree examination or any other examination equivalent to or higher than the degree examination.
- a. English
 - b. Hindi**
 - c. Urdu
 - d. The Language of State Concerned
467. An employee shall be deemed to have acquired a working knowledge of Hindi if he has passed the Matriculation or an equivalent or higher examination with as one of the subjects.
- a. English
 - b. Hindi**
 - c. Urdu
 - d. The Language of State Concerned
468. An employee shall also be deemed to have acquired a working knowledge of Hindi if he has passed the conducted under the Hindi Teaching Scheme of the Central Government.
- a. Pragya
 - b. Praveen
 - c. Prabodh
 - d. Pragya/Praveen/Prabodh exam specified by the Govt. as per Group A/B/C**
469. All manuals, codes and other procedural literature (printed or cyclostyled as the case may be) relating to Central Government offices shall be published in
- a. English
 - b. Hindi
 - c. Hindi & English
 - d. Hindi and English in diglot form**
470. The forms and headings of registers used in any Central Government office shall be in
- a. English
 - b. Hindi
 - c. Hindi & in English**

- d. Hindi and English in diglot form
471. All name-plates, sign-boards, letter-heads and inscriptions on envelopes and other items of stationery written, printed or inscribed for use in any Central Government office, shall be in
- a. English
 - b. Hindi
 - c. **Hindi & in English**
 - d. Hindi and English in diglot form
472. It shall be the responsibility of the of each Central Government office to ensure that the provisions of the OL Act and the OL Rules are properly complied with.
- a. **Administrative Head of the Department**
 - b. Group officer concerned
 - c. Branch Officer
 - d. Hindi Officer
473. Notwithstanding anything contained in rules the Central Government may, by order specify the notified offices where Hindi alone shall be used for noting, drafting and for such other official purposes as may be specified in the order by employees who possess proficiency in Hindi.
- a. 8(1) of OL rules 1976
 - b. Rule 8(2) of OL rules 1976
 - c. **8(4) of OL rules 1976**
 - d. 8(3) of OL rules 1976
474. Union Territory of Andaman and Nicobar Islands is under
- a. **Region 'A'**
 - b. Region 'B'
 - c. Region 'C'
 - d. Exempted from any Region limits
475. The provisions of section 6 and section 7 of the OL Act 1963 shall not apply to the State of
- a. **Jammu and Kashmir**
 - b. Tamil Nadu
 - c. Nagaland
 - d. None

476. The names of the Central Government offices, the staff whereof have acquired a working knowledge of Hindi, shall be notified in the Official Gazette under rule
- 10(1) of OL rules 1976
 - Rule 10(2) of OL rules 1976
 - 10(3) of OL rules 1976
 - 10(4) of OL rules 1976**
477. might be co-opted as Member-Secretary to the Selection/Purchase Committee of the Libraries in the attached and subordinate offices.
- Branch Officer
 - Group Officer
 - Secretary
 - Hindi Officer**
478. The Central Government may, if it is considered necessary to do by general or special order exempt any Central Government office from all or any of the provisions of the of OL Rules 1976.
- Rule 11**
 - Rule 12
 - Rule 10
 - Rule 8
479. As per Section 2 (b) of OL Act 1963 'Hindi' means-
- Bhojpuri
 - Khari Boli
 - Saurshaini
 - Hindi in Devanagari Script**
480. The shall be used for purposes of communication between the Union and a State which has not adopted Hindi as its Official Language.
- English language**
 - Hindi language
 - Urdu language
 - Concerned State Language
481. From the given below which document is mandatory to be issued both in Hindi and English Language?
- General Orders**
 - Branch Orders

- c. Notes
 - d. Letters issued to region area
482. The Committee on Official Language shall consist of
- a. 20 Members
 - b. 30 Members**
 - c. 40 Members
 - d. 50 Members
483. It shall be the duty of the Committee to review the progress made in the use of Hindi for the official purposes of the Union and submit a report to the making recommendations thereon.
- a. Minister of Home Affairs
 - b. Prime Minister
 - c. OL Department
 - d. President**
484. The Committee on Official Language shall consist of Members from Lok Sabha
- a. 10 Members
 - b. 15 Members
 - c. 20 Members**
 - d. 30 Members
485. The Committee on Official Language shall consist of Members from Rajya Sabha
- a. 10 Members**
 - b. 15 Members
 - c. 20 Members
 - d. 30 Members
486. The directions of the President on the report submitted by the Committee on Official Language shall not be inconsistent with the
- a. Section 3 of OL Act 1963**
 - b. OL Rules 1976
 - c. View of home Minister
 - d. View of Prime Minister
487. The Ministry of.....may provide an authorized Hindi translation of Parliamentary legislation.

- a. Home Affairs
- b. Law**
- c. Parliamentary Affairs
- d. Personnel, Public Grievances and Pensions

488. “As the medium of examination of ‘All-India Services and higher Central Services’ both Hindi and English shall be available at the option of the candidate” This option has been given under the authority of

- (A) Section 3 of OL Act 1963
- (B) Rule 6 of OL Rules 1976
- (C) Para 9 of the President’s Orders 1960**
- (D) Para 10 of the President’s Orders 1960

489. The Chairman of the Council of States or Speaker of the House of the People, or person acting as such, as the case may be, may permit any member who cannot adequately express himself in Hindi or in English to address the House in

- (A) any Regional Language
- (B) his mother tongue**
- (C) the Language of his State
- (D) any foreign Language

490. 7‘The official language of the Union shall be Hindi in Devanagari Script’ is mentioned in

- (A) Sec. 2 (b) of OL Act 1963
- (B) OL Rules 1976
- (C) the President’s Orders 1960
- (D) Article 343 (1) of the Constitution**

491. Which Section from following authorized the President to issue Orders 1960 on the report of Official Language Commission?

- (A) OL Act
- (B) Rule 6 of OL Rules
- (C) The President himself being an Authority
- (D) Article 344 (6) of the Constitution**

492. Language provisions are mentioned in the Article in the Constitution of India.

- a. (A) 333 to 343
- b. (B) 343 to 345

- c. (C) 343 to 350
 - d. **(D) 343 to 351**
493. Directive for development of the Hindi language are mentioned in the Article-
- a. (A) 343
 - b. (B) 345
 - c. **(C) 351**
 - d. (D) 365
494. All the languages included in the Eighth Schedule to the Constitution and English shall be permitted as alternative media for the All India and higher Central Services examinations” is mentioned in the
- a. **(A) Para 4(A) of the Official Language Resolution, 1968**
 - b. (B) Rule 3(1) of OL Rules 1976
 - c. (C) Section 3 (2) of OL Act 1963
 - d. (D) Article 350 of the Constitution of India
495. Compulsory knowledge of either Hindi or English shall be required at the stage of selection of candidates for recruitment to the Union services is mentioned in the
- a. **(A) Para 4 (B) of the Official Language Resolution, 1968**
 - b. (B) Rule 3(1) of OL Rules 1976
 - c. (C) Section 3 (2) of OL Act 1963
 - d. (D) Article 350 of the Constitution of India
496. Which item from following authorizes the Ministry of Home Affairs for the preparation and implementation of annual programme that is concerned with preparatory measures for facilitating the progressive use of Hindi?
- a. (A) OL Act 1963
 - b. (B) OL Rules 1976
 - c. (C) The Ministry of Home Affairs itself being an Authority
 - d. **(D) Para 14 of the President’s Order 1960 ‘**
497. The Eighth Schedule of the Constitution specifies major languages of India besides Hindi, and it is necessary in the interest of the educational and cultural advancement of the country that concerted measures should be taken for the full development of these languages;

- a. (A) 14
 - b. (B) 18
 - c. **(C) 22**
 - d. (D) 24
498. “In interview for recruitment, option of Hindi medium should be also available along with English” is mentioned in
- a. (A) Section 3(3) of OL Act 1963
 - b. (B) Rule 6 of OL Rules 1976
 - c. (C) Para 12 of the President’s Order 1960
 - d. **(D) Presidential Orders on Para 22 (E) of the 3rd part of the Report of Committee of Parliament**
499. Which of the following provisions compels the Head of the Office to attend the Meeting of TOLIC
- a. (A) Section 9 of OL Act 1963
 - b. (B) Para 10 of the President’s Order 1960
 - c. **(C) Presidential Orders on Para 16.5 (i) of the 7th part of the Report of Committee of Parliament**
 - d. (D) There is no compulsion to attend such meetings by the Head of the Offices
500. “The headings of the registers available in all the Govt. Offices and of the service books of all categories of officers and employees should be bilingual and the entries therein should be made in Hindi as far as possible” is mentioned in
- a. (A) Section 3 of OL Act 1963
 - b. (B) The President’s Order 1960
 - c. **(C) Presidential Orders on the 4th part of the Report of Committee of Parliament**
 - d. (D) There is no compulsion to follow the above in the region ‘C’ Offices
501. Which of the following is true for variable names in C?
- a. a) They can contain alphanumeric characters as well as special characters
 - b. b) It is not an error to declare a variable to be one of the keywords (like goto, static
 - c. **c) Variable names cannot start with a digit**
 - d. d) Variable can be of any length
502. The Government of India has instituted an award for the original writing of books in Hindi by its (including retired) employees.
- a. (a) Maithilisharan Gupta Award Scheme
 - b. **(b) Rajbhasha Gaurav Award Scheme**

- c. (c) Premchand Award Scheme
 - d. (d) Railway Minister's Award Scheme
503. How many training courses are prescribed for language training of central government employees?
- a. (a) Two
 - b. (b) Three
 - c. **(c) Four**
 - d. (d) Five
504. Regarding the use of language of which institution is provided for in Article 343 of the Constitution?
- a. (a) Legislature
 - b. (b) Legislative Assembly
 - c. **(C) Legislative**
 - d. (d) Supreme Court

e) The Factories Act and Hours of Employment Rules and Workmen Compensation Act
f) Rules pertaining to leave, pass, wages, conduct and discipline and appeal rules

505. Under Factories act who is called as adult.
- A. Person who has completed 15 years of age
 - B. Person who has completed 16 years of age
 - C. Person who has completed 17 years of age
 - D. **Person who has completed 18 years of age**
506. A person who has ultimate control over the affairs of the factory under Factories Act, 1948 is called as
- A. **Occupier**
 - B. CEO
 - C. Chairman
 - D. Managing Director
507. Which of the following is not a statutory welfare facility as per factories act, 1948
- A. Canteen
 - B. Crèches
 - C. **Transport**
 - D. Drinking water
508. No worker shall be required or allowed to work in a factory for more than -----hours in any week.
- A. 64 hours
 - B. 08 hours

- C. 36 hours
- D. **48 hours**

509. No substitution shall be made which will result in any worker working for more than ----- days consecutively without a Holiday for a whole day.
- A. **Ten**
 - B. Six
 - C. Twelve
 - D. Seven
510. If there is any willful removal or disregard by the workman of any safety guard or other device which he knew to have been provided for the purpose of securing safety of the workman
- A. Employer is liable to pay compensation
 - B. **Employer is not liable to pay compensation**
 - C. State government is liable to pay compensation
 - D. Trade union will pay the compensation
511. LAP shall be credited to a Railway servant at the rate of
- A. 1 ½ days per month
 - B. 1 day per month
 - C. 3 days per month
 - D. **2 ½ days per month**
512. A Trade Apprentices may be granted leave on full stipend for a period not exceeding ----- days per year.
- A. **Twelve**
 - B. Fifteen
 - C. Thirteen
 - D. Ten
513. How many days of LHAP can be accumulated by an employee in his service life
- A. 300 days
 - B. 250 days
 - C. **Unlimited number of days**
 - D. 600 days
514. When no leave is admissible under any other rule, the leave granted is known as
- A. LAP
 - B. LHAP
 - C. Special Leave
 - D. **Extra ordinary Leave**
515. Maximum encashment of leave on average pay is -----.
- A. **300 days**

- B. 180 days
 - C. 600 days
 - D. 350 days
516. Attendants of pass holder is
- A. Any person
 - B. Part time servant
 - C. Servant
 - D. **Full time paid servant**
517. In a Residential card pass issued to a Railway servant who can be accompanied.
- A. **No one can be accompanied**
 - B. Attendant
 - C. Companion
 - D. Spouse
518. Which standard form is used for issuance of major penalty charge sheet on disciplinary proceedings
- A. SF-11
 - B. **SF-5**
 - C. SF-12
 - D. None of the above
519. Disciplinary Authority while passing orders for imposing a penalty should invariably pass
- A. Orders of Penalty
 - B. Penalty advice
 - C. **Speaking order**
 - D. None of the above
520. Who is the competent authority to make rule on RS (D&A) Rules?
- A. **President of India**
 - B. Ministry of Railways
 - C. Member (Staff)
 - D. Secretary Railway Board
521. In case of Electric fire we have to use ----- to extinguish
- A. Water
 - B. **Carbon Dioxide**
 - C. Foam
 - D. Sulphur Dioxide
522. Essential in-direct workers at RWF get ----- % incentive
- A. 100
 - B. 75

- C. 50
- D. **80**

523. Type of incentive followed at RWF is -----.
- A. **Group incentive**
 - B. Individual incentive
 - C. Piece work incentive
 - D. None of the above
524. ISO 9000 determines -----
- A. The procedure used for quality
 - B. Performance of suppliers regarding quality
 - C. Causes for variation in quantity
 - D. **If the company practices its written procedures**
525. ISO 9000 is related to -----
- A. Quantity
 - B. **Quality**
 - C. Customer satisfaction
 - D. Improve safety
526. The ----- is the process that identifies un-safe working conditions and unsafe acts in the plant and recommends safety improvement
- A. Internal audit
 - B. External audit
 - C. **Safety audit**
 - D. None of the above
527. Which of the following TQM techniques prescribes 80 / 20 rule?
- A. **Pareto analysis chart**
 - B. Pie chart
 - C. Fish bone diagram
 - D. Histogram
528. What is TQM
- A. Time and Quality Management
 - B. **Total Quality Management**
 - C. Total Quantity Management
 - D. Time and Quality Manager
529. Which of the following from the 5S technique means to arrange the essential things in order so that they can be easily assessed
- A. Seiri
 - B. **Seiton**
 - C. Seiso

D. SeiketsuO-50000

530. Why are larger lots preferred over smaller lots in case of acceptance sampling
A. **because it is economical**
B. because it is costly
C. because it is time consuming
D. because it is complicated to sample larger lots
531. While setting quality objective ----- is to be considered
A. **Customer need**
B. Organizational need
C. Supplier need
D. Employers need
532. A leader who is honest in speech and upright in character exhibits
A. Patience
B. Servant hood
C. **Integrity**
D. Respect
533. The most dominating cause of environment pollution is -----
A. Increasing population
B. **Industrialization**
C. Use of chemicals in agriculture
D. None of the above
534. Which of the following is non-biodegradable
A. Wool
B. Animal bones
C. **Nylon**
D. Plant leaves
535. The aim of value engineering is to
A. **Minimize the overall cost of production without affecting the quality of the product**
B. Determine the value of production
C. Relate values of job
D. All of the above
536. The abbreviation EOQ stands for
A. Ergonomic office quality
B. **Economic order quantity**
C. Environmentally operational quality
D. Efficient order quantity

537. “Just in Time” is a technique that oriented in Japan and used for
A. Ensuring that employees are punctual
B. Better inventory control
C. Reducing payment of overtime wages
D. **Optimising the outlay of incoming supplies**
538. Which of the following is not a goal shared by Total Productive Maintenance
A. Zero defects
B. Maximum productivity
C. **Minimum productivity**
D. Zero breakdowns
539. ABC inventory control focuses on those
A. Items not readily available
B. Items which consume less money
C. Items which have more demand
D. **Items which consume more money**
540. When was the Official Language rules passed
A. **1976**
B. 1945
C. 1950
D. 1951
541. In which order official rubber stamps are to be prepared at RWF
A. Hindi - Hindi
B. English - English
C. **Hindi- English**
D. English - Hindi
542. When is Hindi day celebrated every year
A. **14th September**
B. 5th June
C. 14th November
D. 11th September
543. How many languages are enlisted in the Eighth schedule of the constitution
A. 15
B. 20
C. **22**
D. 35
544. Which state comes under region ‘A’
A. **Rajasthan**
B. Karnataka

- C. Kerala
 - D. Tamilnadu
545. How many times Hindi exams are conducted in a year
- A. One
 - B. **Two**
 - C. Four
 - D. Three
546. Mention name of the award given by Railway Board for writing Books on Technical subject
- A. **Lal Bahadur Shastri award**
 - B. Premchand award
 - C. Mahatma Gandhi award
 - D. Indira Gandhi award
547. Full form of IREPS in Railways
- A. **Indian Railways E-Procurement System**
 - B. Indian Railways Emergency Procurement System
 - C. Indian Railways Emergency Procurement Service
 - D. None of the above
548. Group 'C' staff having completed 25 years and more service are entitled to get post retirement pass at the rate of
- A. One set per annum
 - B. Three set per annum
 - C. **Two set per annum**
 - D. None
549. The following are not in penalty under D&A rules
- A. **Warning**
 - B. Censure
 - C. With holding of privilege pass / PTO
 - D. Removal from service
550. Penalty of compulsory retirement, removal or dismissed from service should be imposed only by
- A. Controlling officer
 - B. **Appointing authority**
 - C. Disciplinary authority
 - D. Any of the above
551. Ex parte inquiry can be held when
- A. **C.O. does not appear**
 - B. I.O. does not appear

- C. Defense counsel does not appear
 - D. None of the above
552. Computers use the ----- language to process data
- A. Processing
 - B. Binary**
 - C. Primary
 - D. Secondary
553. If the factory employs more than 1000 workers, they should appoint a qualified _____ to carry out the prescribed duties.
- A. Safety Officer**
 - B. Welfare Officer
 - C. Security Officer
 - D. Development Officer
554. If there is any willful removal or disregard by the workman of any safety guard or other device which he knew to have been provided for the purpose of securing safety of the workman
- A. Employer is liable to pay compensation
 - B. Employer is not liable to pay compensation**
 - C. State government is liable to pay compensation
 - D. Trade union will pay the compensation
555. A Trade Apprentices may be granted leave on full stipend for a period not exceeding ----- days per year.
- A. Twelve**
 - B. Fifteen
 - C. Thirteen
 - D. Ten
556. Maximum encashment of leave on average pay is -----.
- A. 300 days**
 - B. 180 days
 - C. 600 days
 - D. 350 days
557. Commuted leave is admissible on
- A. Medical certificate**
 - B. Request of an employee
 - C. Discretion of competent authority
 - D. None of the above
558. Paternity leave is admissible with less than two surviving children for a period of
- A. 30 days
 - B. 15 days**

- C. 60 days
 - D. 300 days
559. A male railway servant may be granted Paternity leave having
- A. Less than two surviving children**
 - B. Four
 - C. Six
 - D. Unlimited number of children
560. Attendants of pass holder is
- A. Any person
 - B. Part time servant
 - C. Servant
 - D. Full time paid servant**
561. In a Residential card pass issued to a Railway servant who can be accompanied.
- A. No one can be accompanied**
 - B. Attendant
 - C. Companion
 - D. Spouse
562. For the purpose of issue of Pass, Railway Servants are governed under: -
- A. Pass rules for Railway Servants.
 - B. Railway servants Pass rules,
 - C. The Railway Servants (Pass) Rules, 1986.**
 - D. Issue of Passes/P.T.O's to Railway men
563. What is the meaning of "set" for the pass/PTO purpose?
- A. it means a pass or PTO as an authority to travel.
 - B. it is applicable for pass purpose only.
 - C. it is applicable for PTO purpose only.
 - D. it means one Pass or PTO for outward and return journey**
564. Which standard form is used for issuance of major penalty charge sheet on disciplinary proceedings
- A. SF-11
 - B. SF-5**
 - C. SF-12
 - D. None of the above
565. Disciplinary Authority while passing orders for imposing a penalty should invariably pass
- A. Orders of Penalty
 - B. Penalty advice
 - C. Speaking order**

- D. None of the above
566. Every railway servant holding a supervisory post shall take all possible steps
A. To ensure the integrity
B. Devotion to duty of all railway servants for the time being under his control and authority
C. Both A & B
D. None of the above
567. "Censure" is a _____
A. Major penalty
B. Minor penalty
C. Both
D. None of the above
568. Every railway servant shall at all times-
A. Maintain absolute integrity
B. Maintain devotion to duty
C. Do nothing which is unbecoming of a railway servant
D. All the above
569. The following is / are used as safety device(s) in machines
A. Limit switch
B. Safety Inter locks
C. Fail Safe
D. All of the above
570. Decibel (db) is a unit used to measure
A. Light
B. Sound
C. Frequency
D. None of the above
571. Which is an example of multitasking?
A. Focusing on one task at a time
B. Working on single task
C. Simultaneously working on multiple tasks
D. Juggling multiple tasks with no order
572. A work order is required for collection of
A. Various costs
B. To access the quality of wheel
C. Both A & B
D. None of the above

573. A work order shall have _____ character alpha numeric code
A. Five
B. Two
C. Three
D. Four
574. First digit of the work order represents the _____
A. Month
B. Year
C. Shop
D. Product
575. Under _____ the employer of an employee is liable to pay compensation to the employee if a personal injury is caused to the employee by accident arising out of and in the course of employment
A. Industrial Disputes Act
B. Factories Act
C. ESI Act
D. Workmen's Compensation Act
576. Employer is not liable to pay compensation under the Employee's Compensation Act in the following cases
A. When the employee is under the influence of Alcohol or Drugs at the time of the Accident
B. Willful disobedience to any order regarding safety
C. Willful removal or disregard of any safety guard
D. All of the above
577. According to Official Language Rule, Karnataka falls under which region
A. Region A
B. Region B
C. Region C
D. Region D
578. Which is the elementary course prescribed for Central Government employees
A. Prabod
B. Praveen
C. Pragya
D. None of the above
579. In which order official rubber stamps are to be prepared at RWF
A. Hindi - Hindi
B. English - English
C. Hindi - English
D. English - Hindi

580. Which state comes under region 'A'
A. Rajasthan
B. Karnataka
C. Kerala
D. Tamilnadu
581. How many Hindi courses are prescribed for Central Govt Employees?
A. One
B. Four
C. Six
D. Five
582. Full form of IRIS is _____
A. Indian Railway Industry standard
B. International Railway Industry Standard
C. Initial Railway Industry Standard
D. None of the above
583. Which of the following is for Environment management?
A. ISO-14001
B. ISO-9000
C. ISO-27000
D. ISO-50000
584. In case of an accident, the victim should be immediately -----
A. Asked to take rest
B. Given medical attention
C. Enquired about the accident
D. None of the above
585. Which of the following from the 5S technique means to arrange the essential things in order so that they can be easily assessed
A. Seiri
B. Seiton
C. Seiso
D. SeiketsuO-50000
586. The annual return under the Factories Act shall be submitted to the Inspector of Factories on or before.
a. 31st January
b. 31st December
c. 30th April
d. 31st March

587. The number of elected workers in the canteen managing committee shall not be more than or less than

- a. more than 5 or less than 2**
- b. more than 20 or less than 10
- c. more than 15 or less than 10
- d. more than 10 or less than 5

588. As per Factories Act, "hazardous process" means any process or activity in relation to an industry specified in the 'First Schedule' where, unless special care is taken, raw materials used therein or the intermediate or finished products, bye-products, wastes or effluents thereof would-

- A. Cause material impairment to the health of the persons engaged in or connected there with
- B. Result in the pollution of the general environment
- C. Only (a)
- D. Both (a) and (b)**

589. "Factory" means any premises including the precincts whereon or more workers are working, or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on with the aid of power.

- A. 10**
- B. 20
- C. 15
- D. 25

590. In any case of a public emergency the State Government may, by notification in the Official Gazette, exempt any factory or class or description of factories from all or any of the provisions of this Act except section for such period and subject to such conditions as it may think fit; provided that no such notification shall be made for a period exceeding three months at a time.

- A. Section 20
- B. Section 67**
- C. Section 60
- D. Section 53

591. As per Factories (Amendment) Act, 1987, if a factory engaged in a hazardous process, the occupier of a factory shall inform the Chief Inspector about the nature and details of the process in such form and in such manner as may be prescribed within a period of days of such commencement

- A. 60
- B. 25
- C. 30**

D. 50

- 592.** The maximum permissible threshold limits of exposure of chemical and toxic substances in manufacturing processes (whether hazardous or otherwise) in any factory shall be of the value indicated in the Schedule.
- A. First Schedule
 - B. Third Schedule
 - C. Fourth Schedule
 - D. Second Schedule**
- 593.** No substitution shall be made which will result in any worker working for more than days consecutively without a holiday for a whole day.
- A. Seven days
 - B. Ten days**
 - C. Twelve days
 - D. Fourteen days
- 594.** The periods of work of adult workers in a factory each day shall be so fixed that no period shall exceed five hours and that no worker shall work for more than five hours before he has had an interval for rest of at least hours.
- A. One and half hours
 - B. One hour
 - C. Half an hour**
 - D. None of the above
- 595.** The period of work of an adult worker in a factory shall be so arranged that Inclusive of his intervals for rest under section 55, they shall not spread over more than in any day:
- A. Nine and a half hours
 - B. Eight and a half hours
 - C. Ten hours
 - D. Ten and a half hours**
- 596.** To avoid overcrowding the space provided for each worker under the Factories Act. 1948 is
- A. 12 cubic meters for factories built before 1948 and 14.2cubic meters for those built after 1948
 - B. 10 cubic meters for factories built before 1948 and 14.2 cubic meters for those built after 1948

C. 9.9 cubic meters for factories built before 1948 and 14.2 cubic meters for those built after 1948

D. 9.9 cubic meters for factories built before 1948 and 14.4 cubic meters for those built after 1948.

597. Which of the following authorities has the power to prescribe the form of certificate of fitness to work in a factory under the Factories Act?

- A. The certifying surgeon.
- B. The owner or occupier of the factory
- C. The Chief Inspector of Factories of the State
- D. The State Government**

598. The maximum daily hours of work in a day with normal wage allowed in factories is

- A. 11 hours
- B. 10 hours
- C. 9 hours**
- D. 8 hours

599. The Bhopal Gas Tragedy led to an amendment under which of the following legislation?

- A. Factories Act
- B. Mines Act
- C. Plantation Labour Act
- D. None of the above**

600. The Factories Act, 1948 requires the appointment of the Safety Officer in factories employing at least

- A. 250 workers
- B. 500 workers
- C. 1000 workers**
- D. None of the above

601. Employees' share of contribution under the ESI Act is

- A. 12%
- B. 8.33%
- C. 0.75%**
- D. 4.75%

602. The employer's share of contribution under the ESI Act is

- A. 12%
- B. 8.33%
- C. 1.75%

D. 3.25%

- 603.** Employees' share of provident fund contribution is
A. 12%
B. 8.33%
C. 1.75%
D. 4.75%
- 604.** Employer's share of contribution to the provident fund is
A. 8.33%
B. 12%
C. 3.67%
D. 4.75%

SECTION - B

TECHNICAL SUBJECTS

ELECTRICAL CIRCUITS

- 605.** Two incandescent light bulbs of 40 W and 60 W rating are connected in series across the mains. Then
(a) The bulbs together consume 100 W
(b) The bulbs together consume 50 W
(c) The 60 W bulb glows brighter
(d) The 40 W bulb glows brighter
Ans: (d)
- 606.** Two resistances are connected in parallel and each dissipates 40 W. The total power supplied by the source is equals to
(a) 80 W
(b) 40 W
(c) 160 W
(d) 20 W
Ans: (a)
- 607.** Three equal resistors, connected in series across a source of emf, dissipated 10W of power. What would be the power dissipated in the same resistor when they are connected in parallel across the same source?
(a) 10W
(b) 30W
(c) 90W

(d) 270W

Ans: (c)

608. 150 resistor and the combination in series with a 120 resistor. The equivalent resistance of the circuit is:

(a) 37 Ω

(b) 27 Ω

(c) 18 Ω

(d) None of these

Ans: (c)

609. The energy used by a 1.5kW heater in 5 minutes is:

(a) 450000 J

(b) 450 J

(c) 7500 J

(d) None of these

Ans: (a)

610. What is called the Electro-Motive Force (EMF) of a voltage source?

(a) Terminal voltage when load is applied

(b) Internal voltage when no load is applied

(c) Product of internal resistance and load current

(d) Electric pressure provided to the load

Ans: (b)

611. One coulomb of electrical charge is contributed by how many electrons?

(a) 0.625×10^{19}

(b) 1.6×10^{19}

(c) 10^{19}

(d) None of these

Ans: (a)

612. It is known that two 20, 2W resistors are connected in parallel. Find the combined resistance and wattage rating.

(a) 2 Ω , 4W

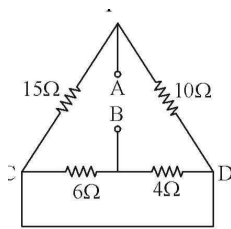
(b) 1 Ω , 4W

(c) 1 Ω , 2W

(d) 2 Ω , 2W

Ans: (b)

613. In the following circuit, determine the equivalent resistance between points A and B.



- (a) 8.4Ω
- (b) 4Ω
- (c) 2.5Ω
- (d) 6.8Ω

Ans: (a)

- 614.** If 10 lamps are connected in series across a power supply, then determine the voltage of the supply when it is given that the voltage across each lamp is 6.0 V.

- (a) 60 V
- (c) 35 V
- (b) 20 V
- (d) 42 V

Ans: (a)

- 615.** Current in a circuit is measured using a simple slide wire. What will be the voltage drop per unit length. If the standard cell is of emf 2.38 V balanced at length of 35 cm.

- (a) 0.68 V/cm
- (b) 0.068 V/cm
- (c) 68 V/cm
- (d) 6.8 V/cm

Ans: (b)

- 616.** The element which is capable of delivering energy by its own is known as:

- (a) Non-linear element
- (b) Unilateral element
- (c) Active element
- (d) Passive element

Ans: c

- 617.** _____ remains the same in all parts of a series circuit.

- (a) Current
- (b) Resistance
- (c) Voltage
- (d) Power

Ans: (a)

618. Resistivity of a wire depends upon

- (a) Material
- (b) Area
- (c) Length
- (d) All of these

Ans: (a)

619. A charge of 0.1 coulomb moves through a given point every 0.05 seconds. The current flowing through the point is

- (a) 2 mA
- (b) 5 mA
- (c) 2 A
- (d) 5 A

Ans: (c)

620. A 220 V, 200 W bulb and a 220 V, 100 W bulb are connected in series across a 220 V supply, the power consumed by them will be

- (a) 33.3 W
- (b) 66.6 W
- (c) 100 W
- (d) 300 W

Ans: (b)

621. A 2.2 m long conductor has a cross sectional area of 0.025 m² and resistance of 5 ohms, find its resistivity.

- (a) 0.072 ohm m
- (b) 0.057 ohm m
- (c) 0.58 ohm m
- (d) 0.67 ohm m

Ans: (b)

622. What will be the largest number of 100 W electric light bulbs which can be operated from a 200V supply fitted with a 13A fuse?

- (a) 16
- (b) 26
- (c) 31
- (d) 32

Ans: (b)

623. _____ is the property of conductor which is opposite to the property that opposes flow of current.

- (a) Conductance
- (b) Resistance
- (c) Reluctance

(d) Inductance

Ans: (a)

624. If the diameter D of a conductor is doubled, its resistance R will be reduced to

(a) $1/4 R$

(b) $16 R$

(c) $1/16 R$

(d) No change

Ans: (a)

625. A nickel coil has a resistance of 16Ω at 50°C . If the temperature coefficient of resistance at 0°C is $0.003/^\circ\text{C}$, the resistance at 0°C is: (approx)

(a) 16.9Ω

(b) 14Ω

(c) 23.3Ω

(d) 15.5Ω

Ans: (b)

626. One coulomb-per-second is equal to one --.

(a) Watt

(b) Joule

(c) Volt

(d) Ampere

Ans: (d)

627. The capacitance of a variable air capacitor is maximum when

(a) The movable plates half overlap the fixed plates

(b) The movable plates are most widely separated from the fixed plates

(c) Both sets of plates are exactly meshed.

(d) The movable plates are closer to one side of the fixed plate than to the other.

Ans: (c)

628. Electrical voltage is also known as:

(a) Electric pressure

(b) Energy

(c) Watt

(d) Unit

Ans: (a)

629. The length of wire having resistance of 1 ohm/m in a heater rated at 1000 W and 250 V will be

(a) 62.8 mm

(b) 26.5 m

(c) 62.5 m

(d) 1.5 m

Ans: (c)

- 630.** Calculate the resistance of 1 km long copper wire of radius 1 mm. (If resistivity of copper = 1.72×10^{-8})
- (a) 5.5Ω
 - (b) 6.5Ω
 - (c) 4.5Ω
 - (d) 6.75Ω

Ans: (a)

- 631.** How is the voltage determined when the current and resistance are given?
- (a) Divide the current by the resistance
 - (b) Subtract the current from the resistance
 - (c) Multiply the current and resistance
 - (d) Add the current and the resistance

Ans: (c)

- 632.** Here two threads B and C have the same cross-section and are made of the same material. $R_b = 500\Omega$ and $R_c = 100\Omega$. The number of times B is longer than C is -----
- (a) 1
 - (b) 5
 - (c) 4
 - (d) 3

Ans: (b)

- 633.** The number of nodal equation in the nodal analysis of a linear circuit having 4 nodes will be
- (a) 6
 - (b) 5
 - (c) 3
 - (d) 4

Ans: (c)

- 634.** What is the total resistance of a series circuit and parallel circuit respectively for resistors $R_1 = 2$ ohms, $R_2 = 4$ ohms and $R_3 = 1$ ohm?
- (a) 1.75, 7
 - (b) 7, 1.5
 - (c) 7, 0.571
 - (d) 7, 7

Ans: (c)

- 635.** The average power consumed in purely inductive circuit is:-
- (a) 0.25
 - (b) 0
 - (c) 0.5
 - (d) 1

Ans: (b)

636. In a DC circuit, which of the following components is used to reduce the voltage?

- (a) Resistor
- (b) Inductor
- (c) Reactor
- (d) Capacitor

Ans: (a)

637. The law of electromagnetic induction is also called

- (a) Joule's law
- (b) Faraday's law
- (c) Coulomb's law
- (d) Ohm's law

Ans: (b)

638. Which of the following correctly defines Power?

- (a) Energy
- (b) kWh
- (c) The rate at which energy is used
- (d) The rate at which energy is generated

Ans: (c)

639. The property of a substance which opposes the flow of current is known as

- (a) Conductance
- (b) Reluctance
- (c) Resistance
- (d) Admittance

Ans: (c)

640. Three equal resistances when combined in series total power loss is 90 W. Their power loss when combined in parallel will be

- (a) 270 W
- (b) 30 W
- (c) 810 W
- (d) 10 W

Ans: (c)

641. The property of a conductor due to which it passes current is called

- (a) Resistance
- (b) Reluctance
- (c) Conductance
- (d) Inductance

Ans: (c)

642. The resistance of a conductor varies inversely as

- (a) Length
- (b) Area of cross-section
- (c) Temperature
- (d) Resistivity

Ans: (b)

643. With rise in temperature the resistance of pure metals

- (a) Increases
- (b) Decreases
- (c) First increases and then decreases
- (d) Remains constant

Ans: (a)

644. Three resistances of 10 Ohms, 15 Ohms and 30 Ohms are connected in parallel. The total resistance of the combination is

- (a) 5 ohms
- (b) 10 ohms
- (c) 15 ohms
- (d) 55 ohms

Ans: (a)

645. In a circuit a 33 Ohm resistor carries a current flow of current known as of 2A.

The voltage across the resistor is

- (a) 33 V
- (b) 66 V
- (c) 80 V
- (d) 132 V

Ans: (b)

646. A light bulb draws 300 mA when the voltage across it is 240 V The resistance of the light bulb is

- (a) 400 Ohms
- (b) 600 Ohms
- (c) 800 Ohms
- (d) 1000 Ohms

Ans: (c)

647. Two resistors are not said to be connected in series when

- (a) Same current passes in turn through both
- (b) Both carry the same value of current

- (c) Total current equals the sum of branch currents
- (d) Sum of IR drops equals the applied e.m.f.

Ans: (c)

648. Which of the following statements is true both for a series and a parallel D.C. circuit?

- (a) Elements have individual currents
- (b) Currents are additive
- (c) Voltages are additive
- (d) Powers are additive

Ans: (d)

649. If the energy is supplied from a source, whose resistance is 1 Ohm, to a load of 100 Ohms the source will be

- (a) A voltage source
- (b) A current source
- (c) Both of above
- (d) None of the above

Ans: (a)

650. The circuit whose properties are same in either direction is known as

- (a) Unilateral circuit
- (b) Bilateral circuit
- (c) Irreversible circuit
- (d) Reversible circuit

Ans: (b)

651. The number of independent equations to solve a network is equal to

- (a) The number of chords
- (b) The number of branches
- (c) Sum of the number of branches and chords
- (d) Sum of number of branches, chords and nodes

Ans: (a)

652. Siemens is a unit for measuring

- (a) Resistance
- (b) Flux density
- (c) Conductance
- (d) Electric field

Ans: (c)

653. What is the equivalent resistance of one limb A when delta connection is transformed into star?

- (a) $R_1 R_3 / (R_1 + R_2 + R_3)$

- (b) $R_2 R_3 / (R_1 - R_2 + R_3)$
- (c) $R_1 R_2 R_3 / (R_1 + R_2 + R_3)$
- (d) $R_1 + R_2 + R_3$

Ans: a)

654. A linear circuit contains ideal resistors and ideal voltage source. If values of all the resistors are halved then voltage across each resistor becomes.

- (a) Halved
- (b) Doubled
- (c) Remained unchanged
- (d) Decreased by 4 times

Ans: (c)

655. A star circuit has each branch resistance of $R/2$. The equivalent delta each branch resistance will be:

- (a) $R/6$
- (b) $3 R/2$
- (c) $2 R$
- (d) $4 R$

Ans: (b)

656. An electric circuit with 10 branches and 7 nodes will have:

- (a) 4 loop equation
- (b) 7 loop equation
- (c) 10 loop equations
- (d) 5 loop equations

Ans: (a)

657. In terms of ABCD parameters, a two port network is symmetrical if and only if

- (a) $A = B$
- (c) $C = D$
- (b) $B = C$
- (d) $D = A$

Ans: (d)

658. Network which contain one or more than one source of emf is known as

- (a) Active Network
- (b) Passive Network
- (c) Electric network
- (d) None of these

Ans: (a)

659. Delta/star or star/delta transformation technique is applied to :

- (a) One terminal network
- (b) Two terminal network
- (c) Three terminal network
- (d) None of these

Ans: (c)

- 660.** In a parallel circuit all components must ____
- (a) Have same potential difference across them
 - (b) Have the same value
 - (c) Carry the same current
 - (d) All of the above

Ans: (a)

- 661.** A Student connects four cells each of emf 2 V and internal resistance 0.5 Ω . In series but the one cell has its terminal reversed. Now the current in parallelly connected 2 Ω resistor-
- (a) zero
 - (b) 1 A
 - (c) 1.5 A
 - (d) 2 A

Ans: (b)

- 662.** High pass T Filter has
- (a) Low input impedance at low frequencies
 - (b) High input impedance at high frequencies
 - (c) High output impedance at low frequencies
 - (d) Low input impedance at high frequencies

Ans: (d)

- 663.** A network having a battery source in one of its arms is termed as -----
- (a) Linear network
 - (b) bilateral network
 - (c) active network
 - (d) passive network

Ans: (c)

- 664.** Two resistances R and 2R are connected in parallel in an electric circuit. The thermal energy developed in R and 2R are in the ratio
- (a) 1:2
 - (b) 2:1
 - (c) 1:4
 - (d) 4:1

Ans: (b)

- 665.** Two resistance R₁ and R₂ are connected in series R₁ = 528 $\pm$ 5 Ω and R₂ = 325 $\pm$ 3 Ω .

The total resistance will be -

- (a) $853 \pm 2\Omega$
- (b) $853 \pm 5\Omega$
- (c) $853 \pm 3\Omega$
- (d) $853 \pm 8\Omega$

Ans: (d)

666. Potential difference across a 0.04 F capacitance is 4 V Charge stored in it will be :

- (a) 0.1 C
- (b) 2.1 C
- (c) 0.16 C
- (d) 0.016 C

Ans: (c)

667. A capacitor dissipates

- (a) no energy
- (b) 10% of the stored energy
- (c) 20% of the stored energy
- (d) 50 % of the stored energy

Ans: (a)

668. A charge of 5 μC passes through a circuit element during a particular interval of time, that is in 10ms duration. Determine the average current in this element during that interval of time:

- (a) 50 μA
- (b) 50 mA
- (c) 50 nA
- (d) 0.5 mA

Ans: (d)

669. Two 10 μF capacitors are connected in parallel. What is the equivalent capacitor value ?

- (a) 25 μF
- (b) 40 μF
- (c) 5 μF
- (d) 20 μF

Ans: (d)

670. If a capacitor stores 100 μC charge at 10 volts, the capacitance value is:

- (a) 100 μF
- (b) 1000 μF
- (c) 10 μF
- (d) 1 μF

Ans: (c)

671. During charging of a capacitor of $C = 100\ \mu\text{F}$ through a resistance of $1\ \text{k}\Omega$ applied with $100\ \text{V}$, the voltage at one time constant is -----
- (a) $36.7\ \text{V}$
 - (b) $63.2\ \text{V}$
 - (c) $100\ \text{V}$
 - (d) $63.7\ \text{V}$

Ans: (b)

672. For power factor improvement the amount of capacitance required for star connected capacitor bank is:
- (a) Three times less than delta connected banks
 - (b) Half of the delta connected banks
 - (c) Equal to delta connected banks
 - (d) Three times more than delta connected banks

Ans: (d)

673. A variable capacitor is one whose capacitance:
- (a) Changes with time
 - (b) Changes with temperature
 - (c) Changes with voltage
 - (d) Can be changed

Ans: (d)

674. If an uncharged capacitor is connected to an energy source then-
- (a) The capacitor acts as an open circuit
 - (b) Current will start flowing in the capacitor in due course of time
 - (c) Current will flow instantaneously
 - (d) None of these

Ans: (c)

675. Two capacitors of equal value, $1\ \mu\text{F}$, are connected in parallel. The effective capacitance of this combination would be
- (a) $2\ \mu\text{F}$
 - (b) $0.5\ \mu\text{F}$
 - (c) $4\ \mu\text{F}$
 - (d) $0.25\ \mu\text{F}$

Ans: (a)

676. A voltage source (V) is connected across a capacitor (C) through a switch to form a circuit. At the instant the switch is closed -

- (a) An infinite current flows through the capacitor C after some time
- (b) An infinite current flows through the capacitor C instantaneously
- (c) No current will flow through the capacitor but a voltage V will appear across the capacitor
- (d) None of these

Ans: (b)

677. If three capacitors C1, C2 and C3 of values of $1\mu\text{F}$, $2\mu\text{F}$ and $4\mu\text{F}$ respectively are in series and connected across a potential of 230 V, then total charge on all series capacitor is :

- (a) $110 \times 10^{-6} \text{ C}$
- (b) $121 \times 10^{-6} \text{ C}$
- (c) $131 \times 10^{-6} \text{ C}$
- (d) $61 \times 10^{-6} \text{ C}$

Ans: (c)

678. A capacitor opposes:

- (a) Change in current
- (b) Change in voltage
- (c) Both change in current and voltage
- (d) None of these

Ans: (b)

679. Two capacitors of capacitances $3\mu\text{F}$ and $6\mu\text{F}$ in series will have a total capacitance of :

- (a) $9 \mu\text{F}$
- (b) $2 \mu\text{F}$
- (c) $18 \mu\text{F}$
- (d) $24 \mu\text{F}$

Ans: (b)

680. The maximum energy (W) stored in a capacitive circuit is: (Where C = capacitance of the circuit and E = potential applied)

- (a) $W = CE^2$
- (b) $W = C^2E$
- (c) $W = 1/2 (CE^2)$
- (d) $1/2 (C^2E)$

Ans: (c)

681. An electrolyte capacitor can be used for:

- (a) DC only
- (b) AC only
- (c) Both
- (d) None

Ans: (a)

682. The capacitance of a parallel plate capacitor is not affected by:

- (a) Thickness of conduction plates
- (b) Area of the conducting plates
- (c) Distance separating the plates
- (d) Nature of the dielectric between the plates

Ans: (a)

683. The electrical capacitance is analogous of

- (a) Fluid flow
- (b) Thermal resistance
- (c) Inertia
- (d) Spring

Ans: (d)

684. A capacitor is charged by constant current of 2 mA and results in a voltage increase of 12V at 10 sec interval. The value of capacitance is

- (a) 0.75 milli Farad
- (b) 24 milli Farad
- (c) 12 milli Farad
- (d) 1.67 milli Farad

Ans: (d)

685. Two capacitors of 2 μF and 3 μF are connected in series across 1 OV. The potential difference across the 2 μF capacitor will be:

- (a) 4 V
- (b) 6 V
- (c) 10 V
- (d) 0 V

Ans: (b)

686. A battery of 40 V and three capacitor of 1000 mF, 500 mF, and 100 mF are all connected in (I) parallel and (II) series. The ratio of total charge stored in case (I) that in case (II) is approximately

- (a) 3:64
- (b) 64:3
- (c) 160:3
- (d) 104:5

Ans: (d)

687. A capacitor capable of storing 1J of energy at 100 V DC supply. The value of capacitance will be?

- (a) 100 μF
- (b) 200 μF
- (c) 50 μF
- (d) 400 μF

Ans: (b)

688. An air-filled parallel plate capacitor made of square plates, each 10 cm x 10 cm, has a capacitance C . If the plates are reduced to 2.5 cm x 2.5 cm, what would be the new capacitance?

- (a) $C/4$
- (b) $C/8$
- (c) $C/16$
- (d) $C/32$

Ans: (c)

689. A coil would behave as -----

- (a) An inductor at high frequencies
- (b) A capacitor at very low frequencies
- (c) A resistor at high frequencies
- (d) A capacitor at very high frequencies

Ans: (d)

690. Power factor of a circuit can be improved by the use of:

- (a) Choke coil
- (b) Capacitor
- (c) Induction motor
- (d) None of these

Ans: (b)

691. A circuit component that opposes the change in circuit voltage is

- (a) Resistance
- (b) Capacitance
- (c) Inductance
- (d) All of these

Ans: (b)

692. Capacitance, Voltage and Charge are related as

- (a) $Q = CV$
- (b) $C = QV$
- (c) $V = QC$
- (d) None of these

Ans: (a)

693. If four 80 micro farad capacitors are connected in series, the net capacitance is -----

- (a) 20 μF
- (b) 40 μF
- (c) 160 μF
- (d) 320 μF

Ans: (a)

694. The energy required to charge a 10 F capacitor to 100 Vis

- (a) 0.10 J
- (b) 5×10^4 J
- (c) 5×10^{-9} J
- (d) 10×10^{-9} J

Ans: (b)

695. Capacitance of a capacitor

- (a) Increases with increases in overlapping area of plates
- (b) Increases with increases in relative permittivity of the dielectric
- (c) Increases with decreases in distance between the plates
- (d) All of the above

Ans: (d)

696. Two capacitors of 2 F each are connected in series to a 1 V battery. The total charge supplied by the battery to capacitors is

- (a) 1 C
- (b) 2 C
- (c) 0.5 C
- (d) 0.25 C

Ans: (a)

697. Capacitors used for improvement of power factor of a system because capacitor -----

- (a) Draws lagging power and supply leading power
- (b) Draws lagging power and supply lagging power
- (c) Draws leading power and supply lagging power
- (d) Draws leading power and supply leading power

Ans: (c)

698. The unit of dielectric strength is given by

- (a) V/m
- (b) V^2/m
- (c) m/V
- (d) m/V^2

Ans: (a)

699. A capacitor stores energy in -----

- (a) Electric field
- (b) Electromagnetic
- (c) Magnetic field
- (d) Dielectric dipole

Ans: (a)

700. Power factor in an industry can be improved by:

- (a) Transformer
- (b) Capacitor
- (c) Inductor
- (d) Stabilizer

Ans: (b)

701. The power factor of a pure capacitive circuit is:

- (a) maximum
- (b) unity
- (c) 0.8 leading
- (d) Zero

Ans: (d)

702. A circuit requires a capacitor of 100 μF , 25V The capacitor can be:

- (a) Paper capacitor
- (b) Electrolytic capacitor
- (c) Ceramic capacitor
- (d) Any type of capacitor

Ans: (b)

703. The total capacitance of two 40 μF series connected capacitors in parallel with a 4 μF capacitor is

- (a) 3.8 μF
- (b) 5 μF
- (c) 24 μF
- (d) 44 μF

Ans: (c)

704. With a fixed value capacitor C and variable voltage V across it, the energy stored in the capacitor is.

- (a) CV^2
- (b) $0.5CV^2$
- (c) $2CV^2$
- (d) CV

Ans: (b)

705. In capacitor circuit, the current leads the voltage by an angle ϕ the loss angle of the same capacitor will be

- (a) ϕ
- (b) $(90-\phi)$
- (c) $(90+\phi)$
- (d) None

Ans: (b)

706. When two capacitors are connected in series, there total value of capacitance -

- (a) Remains same
- (b) Reduces
- (c) Increases
- (d) None of these

Ans: (b)

707. Two capacitor C1 and C2 have $C1=20\mu\text{F}$ and $C2=30\mu\text{F}$, are connected in parallel across a 100V source. The net capacitance of the circuit is?

- (a) $50\mu\text{F}$
- (b) $10\mu\text{F}$
- (c) $12\mu\text{F}$
- (d) $60\mu\text{F}$

Ans: (a)

708. Which of the following capacitors are used in D.C. circuits?

- (a) Mica
- (b) Air
- (c) Ceramic
- (d) Electrolytic

Ans: (d)

709. If three $15\mu\text{F}$ capacitors are connected in series, the net capacitance is

- (a) $5\mu\text{F}$
- (c) $50\mu\text{F}$
- (b) $40\mu\text{F}$
- (d) $30\mu\text{F}$

Ans: (a)

710. If distance between two plates of a parallel plate capacitor is half, the capacitance:

- (a) Doubles
- (b) Quintuples
- (c) Is halved

(d) Remains the same

Ans: (a)

711. Potential applied across a 2F capacitor is 10 V. Energy stored will be:

(a) 200 J

(b) 100 J

(c) 20 J

(d) 10 J

Ans: (b)

712. A capacitor C at time $t=0$ with initial charge Q_0 acts as

(a) Short circuit

(b) Open circuit

(c) Current source

(d) Voltage source

Ans: (d)

713. Which of the following materials has the maximum dielectric strength?

(a) Porcelain

(b) Glass

(c) Polystyrene

(d) Soft rubber

Ans: (a)

714. The reactance of capacitors increases, when:

(a) Applied voltage increases

(b) AC frequency increases

(c) Applied voltage decreases

(d) AC frequency decreases

Ans: (d)

715. If a capacitance is charged by a square wave current source, then the voltage across the capacitor will be

(a) Square wave

(b) Step function

(c) Triangular wave

(d) Zero

Ans: (c)

716. The potential difference across a 20 μF capacitor to charge it with 100 mC is

(a) 10 V

(b) 10 kV

(c) 5 V

(d) 5 kV

Ans: (d)

717. Which of the following statements is correct about capacitors?

- (a) The capacitor open circuit in direct current (DC) circuits and short circuit in alternating current (AC) circuits
- (b) The capacitor short circuit in direct current (DC) circuits and open circuit in alternating current (AC) circuits
- (c) The capacitor disconnects short circuit in both direct current (DC) and alternating current (AC) circuits
- (d) None of these

Ans: (a)

718. Which of the following type of material is used between the plates of a capacitor?

- (a) Insulation material
- (b) Conductive material
- (c) Dielectric material
- (d) All the above

Ans: (c)

719. Which of the following is true for 3.9 k resistor using color-coding technique?

- (a) Red, white, red, gold
- (b) Red, green, orange, silver
- (c) Orange, green, orange, silver
- (d) Orange, white, red, gold

Ans: (d)

720. Which of the following is the correct formula of specific resistance?

- (a) R/L
- (b) RL/A
- (c) RA/L
- (d) A/RL

Ans: (c)

721. Kirchhoff's current law is valid for

- (a) DC circuit only
- (b) AC circuit only
- (c) Both DC and AC circuits
- (d) Sinusoidal source only

Ans: (c)

722. The output voltage of a battery drops from 100 V with zero load current to 80 V when load current is 2 A. The internal resistance of the battery is

- (a) 10Ω
- (b) 20Ω
- (c) 40Ω
- (d) 50Ω

Ans: (a)

723. A capacitor dissipates _____ energy.

- (a) 0%
- (b) 10% of the stored
- (c) 20% of the stored
- (d) 50% of the stored

Ans: (a)

724. Kirchhoff's current law states that

- (a) Net current flow at the junction is positive
- (b) Algebraic sum of the currents meeting at the junction is zero.
- (c) No current can leave the junction without some current entering it.
- (d) Total sum of currents meeting at the junction is zero.

Ans: (b)

725. According to Kirchhoff's voltage law, the algebraic sum of all IR drops and e.m.f.s in any closed loop of a network is always

- (a) Negative
- (b) Positive
- (c) Determined by battery e.m.f.s
- (d) Zero

Ans: (d)

726. Kirchhoff's current law is applicable to only

- (a) Junction in a network
- (b) Closed loops in a network
- (c) Electric circuits
- (d) Electronic circuits

Ans: (a)

727. Mesh analysis is applicable only for the network which is in nature.

- (a) Polar
- (b) Planer
- (c) Non-polar
- (d) Non-planer

Ans: (b)

728. A voltage source and two resistors are connected in parallel. Suppose that $v_s=150V$, $R_1=50\Omega$ and $R_2=25\Omega$. Then each resistance contains current?

- (a) $I_1 = 3 \text{ A}$ and $I_2 = 6 \text{ A}$
- (b) $I_1 = 6 \text{ A}$ and $I_2 = 3 \text{ A}$
- (c) $I_1 = 3 \text{ A}$ and $I_2 = 5 \text{ A}$
- (d) $I_1 = 2 \text{ A}$ and $I_2 = 3 \text{ A}$

Ans: (a)

- 729.** A current source and two resistors are connected in series, suppose that $i_s = 25 \text{ mA}$, $R_1 = 4\Omega$ and $R_2 = 8\Omega$. What is the voltage across each resistor?

- (a) $V_1 = 1 \text{ V}$ and $V_2 = 2 \text{ V}$
- (b) $V_1 = 0.1 \text{ V}$ and $V_2 = 2 \text{ V}$
- (c) $V_1 = 0.2 \text{ V}$ and $V_2 = 0.2 \text{ V}$
- (d) $V_1 = 0.1 \text{ V}$ and $V_2 = 0.2 \text{ V}$

Ans: (d)

- 730.** A voltage source of 10 V and resistor are connected in series. Specify the resistance R so that both of the following conditions are satisfied: $i > 40 \text{ mA}$ and the power absorbed by the resistor is $< 0.5 \text{ W}$.

- (a) 260Ω
- (b) 250Ω
- (c) 220Ω
- (d) 200Ω

Ans: (c)

- 731.** Two resistors of 200 ohm and 100 ohm are connected in parallel to a 100 volt source. Total current taken by the circuit will be -

- (a) 0.66 Ampere
- (b) 3.0 Ampere
- (c) 0.33 Ampere
- (d) 1.5 Ampere

Ans: (d)

- 732.** If a D.C. 240 V is connected across 240 (ohm) resistance, the power of the load is

- (a) 240 watts
- (b) 1 watt
- (c) 10 watts
- (d) 480 watts

Ans: (a)

- 733.** A network is said to be reciprocal if:

- (a) $Z_{12} = Z_{21}$
- (b) $Y_{12} = Y_{21}$
- (c) $AD - BC = 1$
- (d) all of these

Ans: (d)

734. A 12 V battery with an internal resistance 0.5 ohms supply feeds a series circuit containing 20 ohms, 10 ohms, and R. Find the value of R if the current in the circuit is 0.26 A.
- (a) 14.5 ohms
 - (b) 15.6 ohms
 - (c) 4.5 ohms
 - (d) 5.5 ohms

Ans: (b)

735. Superposition theorem is not applicable to network containing
- (a) Non linear elements
 - (b) Dependent voltage source
 - (c) Dependent current source
 - (d) Transformer

Ans: (a)

736. Which of the following theorems can be applied to any network linear or non-linear, active or passive, time variant or time invariant?
- (a) Thevenin theorem
 - (b) Norton theorem
 - (c) Tellegen theorem
 - (d) Superposition theorem

Ans: (c)

737. If the source impedance is capacitive, for maximum transfer of power from the source to the load, the load should be
- (a) Capacitive
 - (b) Resistive
 - (c) Complex conjugate of complex source impedance
 - (d) Exactly the same as the source impedance

Ans: (c)

738. Which of the following is incorrect with regard to the reciprocity theorem?
- (a) Applicable for single voltage source
 - (b) Initial conditions are assumed to be zero
 - (c) There should not be any extra dependent or independent sources in network
 - (d) None of these

Ans: (d)

739. When a source is delivering maximum power to a load, the efficiency of the circuit.
- (a) Is always 50%
 - (b) Is always 75%
 - (c) Is always 100%

(d) Depends on the circuit parameters.

Ans: (a)

740. The Thevenin and Norton circuits are

- (a) Single frequency equivalent circuits
- (b) Multi frequency equivalent circuits
- (c) Equivalent independent of frequency
- (d) Band frequency equivalent circuits

Ans: (a)

741. For a circuit containing linear dependent sources, the following holds in general
The superposition theorem cannot be applied

- (a) The solution requires the solving of multiple non-linear equations.
- (b) The Tellegen theorem does not apply
- (c) The superposition theorem is valid.

Ans: (d)

742. Consider the following statements

- 1. The networks with passive elements are always reciprocal
- 2. All the asymmetrical networks are always non-reciprocal
- 3. The Ohm's Law is applicable even for the dependent sources.

Which of the above statements are/is true?

- (a) 1 and 2
- (c) 3 and 1
- (b) 2 and 3
- (d) only 1

Ans: (d)

743. Consider the following statements

- 1. The source transformation is valid even for the ideal sources.
- 2. The Norton theorem is valid for active as well as for passive networks.
- 3. The maximum power transfer theorem is applicable for fixed loads. Which of the above statements are/is true?

- (a) 1 and 2
- (c) 3 and 1
- (b) 2 and 3
- (d) only 2

Ans: (d)

744. Consider the following statements

- P. The superposition theorem is applicable to only for the passive networks.
- Q. The Tellegen's theorem is applicable to both active as well as passive networks.
- R. In RL circuit with DC excitation the entire steady state source voltage will be dropped across 'L' only.

Which of the above statements is/are true?

- (a) P only
- (b) Q only
- (c) P and Q
- (d) P, Q and R

Ans: (b)

745. To which of the following Superposition theorem is applicable?

- (a) Dependent voltage sources
- (b) Dependent current sources
- (c) Transformers
- (d) All the above

Ans: (d)

746. It was known that a balanced Wheatstone bridge will remain balanced even when the positions of detector and source are interchanged. This observation is based on which of the following theorems?

- (a) Pythagoras theorem
- (b) Duality theorem
- (c) Reciprocity theorem
- (d) None of these

Ans: (c)

747. Which of the following statements is/are correct about Norton Theorem?

- A. The value of the current source is the short circuit current between the two terminals of the network.
- B. Resistance is the equivalent resistances measured between the terminals of the network with all the energy sources are replaced by their internal resistance.
- (a) Only A is correct
- (b) Only B is correct
- (c) Both A & B is correct
- (d) Both A and B is incorrect

Ans: (c)

748. For maximum transfer of power, internal resistance of the source should be

- (a) Equal to load resistance
- (b) Less than the load resistance
- (c) Greater than the load resistance
- (d) None of the above

Ans: (a)

749. While calculating R_{th} in Thevenin's theorem and Norton equivalent

- (a) All independent sources are made dead
- (b) Only current sources are made dead

- (c) Only voltage sources are made dead
- (d) All voltage and current sources are made dead

Ans: (a)

750. The superposition theorem requires as many circuits to be solved as there are

- (a) Sources, nodes and meshes
- (b) Sources and nodes
- (c) Sources
- (d) Nodes

Ans: (c)

751. Norton's theorem results in

- (a) A voltage source with impedance in parallel
- (b) A current source with impedance in parallel.
- (c) A voltage source alone
- (d) A current source alone

Ans: (b)

752. For a network thevenin equivalent is given by $V_{th} = 10\text{ V}$ and $R_{th} = 50\Omega$. If this network is shunted by another 50Ω at load. What is the new Thevenin equivalent of the network?

- (a) 5V, 50Ω
- (b) 5V, 25Ω
- (c) 10V, 50Ω
- (d) 10V, 25Ω

Ans: (b)

753. Which of the following theorem enables a number of voltage (or current) source to be combined directly into a single voltage (or current) source.

- (a) Compensation theorem
- (b) Reciprocity theorem
- (c) Superposition theorem
- (d) Millman's theorem

Ans: (d)

754. Superposition theorem is used to obtain current in or voltage across any conductor of the:

- (a) AC network/AC
- (b) Magnetic network
- (c) Non-linear network
- (d) Linear network

Ans: (d)

755. "Maximum power output is obtained from a network when the load resistance is equal to the output resistance of the network as seen from the terminals of the load".

The given statement is associated with:

- (a) Millman's theorem
- (b) Thevenin's theorem
- (c) Superposition theorem
- (d) Maximum power transfer theorem

Ans: (d)

756. The maximum power that can be transmitted in a network between sources and loads when the system is subject to small disturbances its disturbances called:

- (a) Steady State Stability Limit
- (b) Transient Stability Limit
- (c) Sub-Transient stability Limit
- (d) None of the above

Ans: (a)

757. In Thevenin's theorem, to find Z:

- (a) All independent voltage sources are short circuited and all independent current sources are open circuited
- (b) All independent voltage sources are open circuited and all independent current sources are short circuited
- (c) All independent voltage sources are short circuited and all independent current sources are short circuited
- (d) All independent voltage sources re open circuited and all independent current sources are open circuited

Ans: (a)

758. Closed circuit techniques are based on

- (a) Superposition theorem
- (b) Thevenin's theorem
- (c) Kirchoff's current law
- (d) Kirchoff's voltage law

Ans: (b)

759. "This theorem is applicable only to two sources directly connected in parallel. It is not applicable where there are resistance elements between the sources". This theorem is-

- (a) Millman's theorem
- (b) Reciprocity theorem
- (c) Thevenin's theorem
- (d) Compensation theorem

Ans: (a)

760. The superposition theorem is based on the concept of

- (a) Duality

- (b) Linearity
- (c) Reciprocity
- (d) Non-linearity

Ans: (b)

761. Two identical 2A, 4Ω Norton equivalent circuits are connected in parallel with the like polarity. Combined Norton equivalent circuit will be -----

- (a) 3A, 4 ohm
- (c) 4A, 6 ohm
- (b) 2A, 4 ohm
- (d) 4A, 2 ohm

Ans: (d)

762. Superposition theorem requires as many circuits to be solved as there are

- (a) Sources
- (b) Nodes
- (c) Sources + nodes
- (d) Sources + nodes + meshes

Ans: (a)

763. Two coils in differential connection have self induction of 2 mH and 4 mH and a mutual inductance of 0.15 mH. The equivalent inductance of the combination is

- (a) 5.7mH
- (b) 5.85mH
- (c) 6 mH
- (d) 6.15 mH

Ans: (a)

764. For a pair of lossless magnetically coupled coils with respective self inductance L_1 , L_2 (with $L_1 < L_2$) and mutual inductance M , the following is generally true.

- (a) $M < L_1 + L_2$
- (b) $M^2 < L_1 L_2$
- (c) $M < \min(L_1, L_2)$
- (d) $L_1 < M < L_2$

Ans: (b)

765. The maximum value of mutual inductance of two inductively coupled coils with self inductance $L_1 = 49$ mH and $L_2 = 81$ mH

- (a) 130 mH
- (b) 63 mH
- (c) 32 mH
- (d) 3969 mH

Ans: (b)

766. Which of the following currents can induce the maximum induced voltage in a coil?

- (a) 1A, DC
- (b) 1A, 100 Hz
- (c) 1A, 1 Hz
- (d) 20A, DC

Ans: (b)

767. Two inductances of 1 H each are coupled together. The maximum value of mutual inductance between them is:

- (a) 2 H
- (c) 0.25 H
- (b) 0.5 H
- (d) 1 H

Ans: (d)

768. Which of the following is a unit of reluctance?

- (a) Tesla
- (b) Henry/Wb
- (c) At/Wb
- (d) Wb

Ans: (c)

769. Consider two coils with an inductance of 64 mH and 81 mH respectively. What is the mutual inductance between the coils if the coefficient of coupling between two coils is 0.45?

- (a) 32.4 mH
- (b) 64.8 mH
- (c) 72.5 mH
- (d) None of these

Ans: (a)

770. Which of the following factors determine the inductance?

- (a) Number of turns
- (b) Permeability
- (c) Coil length
- (d) All the above

Ans: (d)

771. What is the equivalent inductance of a combination of two coils which have self inductance of 2 mH and 4 mH respectively and a mutual inductance of 0.15 mH?

- (a) 7.5 mH
- (b) 5.7 mH

- (c) 6.15 mH
- (d) None of these

Ans: (b)

772. A circuit possesses an inductance of 1 H when a current through coil is changing uniformly at the rate of 1 A/s inducing an opposing emf of 'X' volts in it. What is the value of 'X'?

- (a) 1
- (b) 1.5
- (c) 2
- (d) 2.5

Ans: (a)

773. Inductive reactance is defined as the opposition offered by the _____ of a circuit to the flow of an alternating sinusoidal current.

- (a) Resistance
- (b) Inductance
- (c) Capacitance
- (d) Voltage

Ans: (b)

774. Calculate the mutual inductance for a system defined below. Two coils P and Q are kept in parallel planes, such that 70% of the flux produced by coil P links with coil Q. The number of turns in coil P is 10,000 and in coil Q is 12,000. A current of 4 A in coil P produces a flux of 0.04 mWb while a current of 4 A in coil Q produces a flux of 0.08 mWb.

- (a) 1.25 H
- (b) 0.90 H
- (c) 0.10 H
- (d) 3.21 H

Ans: (c)

775. Calculate the reluctance of a magnetic coil which is wound uniformly on an iron core provided that the relative permeability of the iron is 1400. Also, the length of the magnetic circuit is 70 cm and the cross-sectional area of the core is 5 cm².

- (a) 3.6×10^5 AT/Wb
- (b) 7.9×10^5 AT/Wb
- (c) 7.9×10^8 AT/Wb
- (d) 3.6×10^8 AT/Wb

Ans: (b)

776. Calculate the inductance of coil which is wound uniformly on an iron core. Given: Relative permeability of the iron: 1400. Length of the magnetic circuit: 70 cm. Cross-sectional area of the core: 5 cm² Number of turns: 1000.

- (a) 2.53 H
- (b) 8.24 H
- (c) 1.25 H
- (d) 3.56 H

Ans: (c)

777. A 8H choke is carrying a current of 500 mA. The energy supplied by inductor is:

- (a) 2 J
- (b) 4 J
- (c) 0.5 J
- (d) 1 J

Ans: (d)

778. The magnetic field intensity in a material whose relative permeability is 1 when the flux density is 0.005T is:

- (a) 250 AT/m
- (b) 452 AT/m
- (c) 1775 AT/m
- (d) 3980 AT/m

Ans: (d)

779. The unit of reluctance is:

- (a) Ampere-tum
- (b) Ampere-turn/meter
- (c) Ampere-tum/weber
- (d) It is dimensionless

Ans: (c)

780. A 100 tum coil has inductance of 6 mH. If the number of turns is increased to 200, all other quantities remaining the same, the inductance will be:

- (a) 24 mH
- (b) 12 mH
- (c) 3 mH
- (d) None of these

Ans: (a)

781. A magnet is kept in air surrounded by an iron ring. The magnetic lines of force from the magnet will be

- (a) Crowded in the ring
- (b) Crowded in air
- (c) Evenly distributed
- (d) None

Ans: (b)

782. If both the number of turns and core length of an inductive coil are doubled, then its self inductance will be

- (a) Halved
- (b) Doubled
- (c) Quadrupled
- (d) Unaffected

Ans: (b)

783. Mutual inductance between two magnetically coupled coils depends on

- (a) Number of turns only
- (b) Permeability of the core only
- (c) Cross-sectional area of their common core only
- (d) All of the above

Ans: (d)

784. If 1 ampere current is flowing through a 100 mH coil, then energy stored in the coil is

- (a) 0.05 Joules
- (b) 0.5 Joules
- (c) 5.0 Joules
- (d) None of these

Ans: (a)

785. When the current in a coil is increased from 2 A to 4 A in 0.05 seconds, the e.m.f. induced in the coil is 8 V The self inductance of the coil is

- (a) 0.8 H
- (b) 0.4 H
- (c) 0.2 H
- (d) 0.1 H

Ans: (c)

786. The air core coil of a magnetic circuit has 100 turns. The core of the circuit has length of 1m. What must be the inductance of the coil if core diameter is 2 cm?

- (a) 6 μH
- (b) 3.95 μH
- (c) 2 μH
- (d) 1 μH

Ans: (b)

787. Which of the following terms is analogous to conductivity?

- (a) Inductance
- (b) Permeability
- (c) Retentivity
- (d) Resistivity

Ans: (b)

788. Two coupled inductors $L_1 = 0.2 \text{ H}$ and $L_2 = 0.8 \text{ H}$ have coefficient of coupling $K = 0.7$. The mutual inductance M is
- (a) 0.2 H
 - (b) 0.28 H
 - (c) 0.112 H
 - (d) 1 H

Ans: (b)

789. Two coils of inductance 4 and 6 Henry are connected in series. If their mutual inductance is 3 Henry, what is the equivalent inductance of the combination if mutual inductance opposes the self inductance
- (a) 2 H
 - (b) 1 H
 - (c) 4 H
 - (d) 16 H

Ans: (c)

790. From source $V_s = 200 \cos \omega t$, a load draws current $i_m = 2.5 \text{ A}$ at power factor 0.6 lagging. The load impedance is:
- (a) $(48 + 64j) \Omega$
 - (b) $(40 + 50j) \Omega$
 - (c) $(30 + 64j) \Omega$
 - (d) $(48 + 50j) \Omega$

Ans: (a)

791. In a source free RLC circuit (series), if the neper frequency is greater than undamped natural frequency, then the response is
- (a) Over damped
 - (b) Under damped
 - (c) Critically damped
 - (d) Oscillatory

Ans: (a)

792. The instantaneous power in ac circuits can be obtained by taking product of the instantaneous values of and -----
- (a) Current, voltage
 - (b) Frequency, voltage
 - (c) Frequency, current
 - (d) Frequency (max), voltage

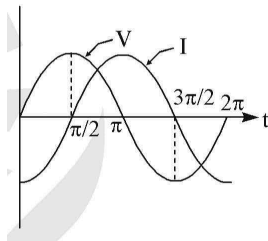
Ans: (a)

793. Which of the following circuit will be unity power factor?

- (a) Inductance
- (b) Resistance
- (c) Capacitance
- (d) Inductance and Capacitance

Ans: (b)

794. The wave forms shown below indicate:



- (a) V lags I by π
- (b) V leads I by π
- (c) V lags I by $\pi/2$
- (d) V leads I by $\pi/2$

Ans: (d)

795. An alternating voltage is given by $V = 20 \sin 157t$, the frequency of the alternating voltage is

- (a) 75 Hz
- (b) 100 Hz
- (c) 50 Hz
- (d) 25 Hz

Ans: (d)

796. Resonance in RLC series circuit occurs at a frequency:

- (a) $f_r = \frac{1}{\pi\sqrt{LC}}$
- (b) $f_r = 2\pi\sqrt{LC}$
- (c) $f = \frac{R}{2\pi\sqrt{LC}}$
- (d) $f = \frac{1}{2\pi\sqrt{LC}}$

Ans: (d)

797. The parallel circuit consists of an inductive branch with R and L as its resistance and inductance, and a capacitance branch with C farad. The impedance offered "by this circuit under resonance condition is given by:

- (a) $Z = LCR$
- (b) $Z = R/LC$
- (c) $Z = L/CR$
- (d) $Z = LC/R$

Ans: (c)

798. In an RLC series circuit the condition below the resonant frequency is:

- (a) $X_c > X_L$
- (b) $X_c + X_L$
- (c) $X_c < X_L$
- (d) $X_c = X_L$

Ans: (a)

799. In a source free RLC parallel circuit, $R = 4\Omega$, $L = 8H$ and $C = \frac{1}{2}F$. The natural response is

- (a) Over damped
- (b) Critically damped
- (c) Under damped
- (d) Oscillatory

Ans: (c)

800. An alternating voltage is given by $V = 200 \sin 314t$. Its rms value will be:

- (a) 110 V
- (b) 282.8 V
- (c) 121.4 V
- (d) 141.4 V

Ans: (d)

801. Two sinusoidal currents are given by following equations: $i_1 = 10 \sin(\omega t + \pi/3)$,
 $i_2 = 15 \sin(\omega t - \pi/4)$

The phase difference between them is

- (a) 105°
- (b) 75°
- (c) 15°
- (d) 60°

Ans: (a)

802. The reactance offered by a capacitor to an alternating current of frequency 50 Hz is 10 ohm. If frequency is increased to 100 Hz, the reactance will be

- (a) 2.5 ohm
- (b) 5.0 ohm
- (c) 20.0 ohm
- (d) 40.0 ohm

Ans: (b)

803. The r.m.s. value of a half-wave rectified alternating current is 10 A. Its value for fullwave rectification will be

- (a) $20/\pi$ A
- (b) $40/\pi$ A
- (c) $20/\sqrt{2}$ A

(d) 20 A

Ans: (c)

804. An alternating current given by $i = 14.14 \sin(\omega t + \pi/6)$ has an r.m.s. value of

(a) 1.96 A

(b) 7.07 A

(c) 10.0 A

(d) 14.14 A

Ans: (c)

805. For an RLC series AC circuit, the current at series resonance is

(a) Maximum at lagging power factor

(b) Maximum at leading power factor

(c) Maximum at unity power factor

(d) Minimum at unity power factor

Ans: (c)

806. If $v = (a + jb)$ and $i = (c + jd)$, then active power will be given by

(a) $ac + ad$

(b) $ac + bd$

(c) $bc - bd$

(d) $ad + bc$

Ans: (b)

807. In an RLC series AC circuit, if frequency is below the resonant frequency, then

(a) $X_c = X_L$

(b) $X_c < X_L$

(c) $X_c > X_L$

(d) None of these

Ans: (c)

808. An R-L series AC circuit has $R = 10 \text{ ohm}$ and $X_L = 10 \text{ ohm}$. It is connected to an AC voltage source, the phase angle between voltage and current is

(a) 30°

(b) 45°

(c) 60°

(d) 36.8°

Ans: (b)

809. In a delta connection, line current lags behind phase current by:

(a) 30°

(b) 60°

(c) 90°

(d) 120°

Ans: (a)

810. In a series RC circuit the voltage across a pure capacitor is 12V and the voltage across a pure resistance is 5V. Find the source voltage

- (a) 13 V
- (b) 17 V
- (c) 7 V
- (d) 2.7 V

Ans: (a)

811. The instantaneous voltage and current across a load is given by $v = 50 \sin(314t - \pi/6)$ volts and $i = 20 \sin(314t - \pi/2)$ amperes respectively. The active power consumed by the load is

- (a) 500 watt
- (b) 125 watt
- (c) 250 watt
- (d) 200 watt

Ans: (c)

812. In series resonance circuit, increasing inductance to twice its value and capacitance to double of its value then new resonant frequency will be:

- (a) Twice the original resonant frequency
- (b) Half of the original resonant frequency
- (c) It remains same
- (d) Four times the original resonant frequency

Ans: (b)

813. A balanced delta-connected load $(20 + j16)$ ohm/phase is connected to a 3-phase 230 V balanced supply. The line current and the real power drawn respectively are

- (a) 19.9 A and 3.17 kW
- (b) 15.55 A and 4.83 kW
- (c) 19.9 A and 6.34 W
- (d) 11.5 A and 3.17 kW

Ans: (b)

814. If the true power is 120 W and power factor is 0.68, then what will be the apparent power (in VA)?

- (a) 81.6
- (b) 17.6
- (c) 176.47
- (d) 103.2

Ans: (c)

815. What is the value of current in parallel RLC circuit under resonance condition?

- (a) Zero
- (c) Maximum
- (b) Minimum
- (d) None of these

Ans: (b)

816. A parallel RLC circuit has $R = 10000\ \Omega$, $L = 10\text{mH}$ and $C = 1\ \mu\text{F}$. The resonant frequency ω_0 (rad/sec) and Q are respectively given by

- (a) 10^4 and 200
- (b) 10^2 and 1
- (c) 10^4 and 100
- (d) 10^2 and 100

Ans: (c)

817. A balanced delta connected load has an impedance of $9\angle 30^\circ\ \Omega$ /phase. What is the impedance/phase of its equivalent star?

- (a) $27\angle 30^\circ\ \Omega$
- (b) $27\angle 90^\circ\ \Omega$
- (c) $3\angle 30^\circ\ \Omega$
- (d) $3\angle 20^\circ\ \Omega$

Ans: (c)

818. For parallel RLC circuit at resonance the expression for quality factor is

- (a) $1/\omega_0 RC$
- (b) $\omega_0 L/R$
- (c) $\omega_0 RC$
- (d) $L/\omega_0 R$

Ans: (c)

819. R and C are connected in parallel across a sinusoidal voltage of 240 V. If the currents through the source and the capacitor are 5 A and 4 A respectively, then what is the value of R ?

- (a) 14 Ω
- (b) 48 Ω
- (c) 80 Ω
- (d) 240 Ω

Ans: (c)

820. Current at resonance in series circuit is ----- and in parallel circuit is -----

- (a) Minimum, maximum
- (b) Maximum, minimum
- (c) Maximum, maximum
- (d) Minimum, minimum

Ans: (b)

821. An ac voltage has frequency of 50 Hz with peak amplitude of 100 V In how many seconds after the zero value of 86.6 V?

(a) 1/300 sec
(b) 1/100 sec
(c) 1/150 sec
(d) 1/600 sec

Ans: (a)

822. An AC voltage is described by $v(t) = 10\cos(400\pi t)$, find out frequency and RMS value of voltage.

(a) 400 Hz, 7.07 V
(b) 400 Hz, 14.14 V
(c) 200 Hz, 14.14 V
(d) 200 Hz, 7.07 V

Ans: (d)

823. The percentage reactance of a 100 KVA, 100, 5kV is given by:

(a) 20 %
(b) 4 %
(c) 2 %
(d) 40 %

Ans: (b)

824. A resistor of 100Ω is connected in series with a $50\mu\text{F}$ capacitor at 50 Hz, 200V supply. What is the phase angle and power factor ?

(a) 32.48° , 0.6365
(b) 32.48° , 0.8435
(c) 36.68° , 0.5370
(d) 32.48° , 0.5370

Ans: (b)

825. The main disadvantage with Nickel-Cadmium cells is

(a) They have a high-energy density
(b) They can be recharged more times than other types of rechargeable batteries
(c) They have to be fully discharged before recharging, because they suffer from a memory effect
(d) All the above

Ans: (c)

826. works on the chemical effects of current

- (a) Power factor meter
- (b) Voltmeter
- (c) DC ampere hour meter
- (d) Wattmeter

Ans: (c)

827. Which of the following batteries does not require trickle charging?

- (a) Lead acid cell
- (b) Alkaline cell
- (c) Lead acid and Alkaline cell both
- (d) Neither lead acid nor alkaline cell

Ans: (b)

828. The most common used primary cell is

- (a) Lithium cell
- (b) Nickel iron cell
- (c) Lead acid cell
- (d) Nickel cadmium cell

Ans: (a)

829. In dry cells, electrons are released at

- (a) Cathode and anode both
- (b) Outside the electrolyte chamber
- (c) Anode
- (d) Cathode

Ans: (c)

830. Salt solutions are

- (a) Insulators
- (b) Semi-conductors
- (c) Good conductors of electricity
- (d) Do not possess electrical properties

Ans: (c)

831. Positive Electrode of a dry cell is made of

- (a) Copper
- (b) Carbon
- (c) Zinc
- (d) Sulphur

Ans: (b)

832. Generally the Leclanche cell is used for

- (a) Continuous purposes
- (b) Heavy purposes
- (c) Low purposes
- (d) Intermittent purposes

Ans: (d)

833. A solar cell is

- (a) Same as photometer
- (b) Same as a photo emissive cell
- (c) Same as photo conductive cell
- (d) Same as photo voltaic cell

Ans: (d)

834. Internal resistance of a cell depends on

- (a) Terminal voltage
- (b) Torque
- (c) Current
- (d) Area of the plates

Ans: (d)

835. What will be the energy used by the battery if the battery has to deliver 6.28×10^{18} electrons with potential difference of 20 V across the terminal?

- (a) 5 J
- (b) 10 J
- (c) 15 J
- (d) 20 J

Ans: (d)

836. The usable capacity of a battery-----

- (a) Increases with increased discharge current
- (b) Decreases with increased discharge current
- (c) Is independent of discharge current
- (d) Depends on discharge time

Ans: (b)

837. Which one of the following sources of energy does a fuel cell consist of ?

- (a) Hydrogen
- (b) Electrical storage
- (c) Natural gas
- (d) Petroleum

Ans: (a)

838. When a lead acid cell is recharged:

- (a) The anode becomes dark chocolate brown colour

- (b) Voltage rises
- (c) Energy is absorbed by the cell
- (d) All of these

Ans: (d)

839. A 6V battery is connected to 300Ω load. Under these conditions, it is rated at 40 Ah. How long can it supply current to the load?

- (a) 1000 h
- (b) 2000 h
- (c) 200 h
- (d) 4000 h

Ans: (b)

840. Petroleum jelly is applied to the terminals of the lead acid battery in order to prevent.

- (a) Corrosion
- (b) Local heating
- (c) Short-circuiting
- (d) All of these

Ans: (a)

841. Trickle charging of storage battery helps to

- (a) Prevent sulphation
- (b) Keep it fresh and fully charged
- (c) Maintain proper electrolyte level
- (d) Increase its reverse capacity

Ans: (b)

842. The term ampere-hour (Ah) is associated with

- (a) Rectifiers
- (b) Transformers
- (c) Electromagnets
- (d) Storage cells

Ans: (d)

843. Cells are connected in series in order increase the

- (a) Current capacity
- (b) Life of the cells
- (c) Voltage rating
- (d) Terminal voltage

Ans: (c)

844. The emf of a cell depends upon

- (a) The internal resistance
- (b) External resistance

- (c) Electrolyte and electrodes of the cell
- (d) None of the factors

Ans: (a)

845. What is the name of the instrument used to measure the specific density of a battery electrolyte
- (a) Pyrometer
 - (b) Hydrometer
 - (c) Lactometer
 - (d) Fuel gauge

Ans: (b)

846. Which of the following primary cell has the lowest voltage?
- (a) Lithium
 - (b) Zinc-chloride
 - (c) Mercury
 - (d) Carbon-zinc

Ans: (c)

847. The active materials of a nickel-iron battery are
- (a) Nickel hydroxide
 - (b) 21 % solution of KOH
 - (c) Powdered iron and its oxide
 - (d) All of the above

Ans: (d)

848. During discharging of lead acid cells, the terminal voltage decrease with the decrease in
- (a) Temperature
 - (b) Discharge rate
 - (c) State of charge
 - (d) None of these

Ans: (b)

849. The process of coating of a metallic surface with a harder metal by electro-deposition is known as:
- (a) Electrofacing
 - (b) Electro ionisation
 - (c) Electrometallisation
 - (d) Electroforming

Ans: (a)

850. The function of the reference electrode in a pH meter is so
- (a) Produce a constant voltage

- (b) Provide temperature compensation
- (c) Provide a constant current
- (d) Measure average pH value

Ans: (a)

851. How can we measure the battery capacity in SI units?

- (a) Wh
- (b) Ah
- (c) kWh
- (d) Vh

Ans: (b)

852. Discharging of a battery

- (a) Reduces specific gravity of the electrolyte
- (b) Increases specific gravity of the electrolyte
- (c) Produces excessive gassing
- (d) Increases the temperature

Ans: (a)

853. When cells are arranged in parallel:

- (a) Current capacity increases
- (b) Current capacity decreases
- (c) The e.m.f. increases
- (d) The e.m.f. decreases

Ans: (a)

854. A battery has a short circuit current 30 A and open circuit voltage of 24 V. If the battery is connected to an electric bulb of resistance 2Ω , the power dissipated by the bulb is:

- (a) 80 W
- (b) 1800 W
- (c) 112.5 W
- (d) 147 W

Ans: (d)

ELECTRICAL MACHINES

855. Deep bar rotor construction is used in three phase induction motors to mainly:

- (a) Control speed
- (b) Control power factor
- (c) Increase starting torque
- (d) None of these

Ans: (c)

856. If a 3-phase, 40V, 50Hz, 4 pole induction motor is running at a slip of 5% then the relative

speed of rotor field with respect to stator field is:

- (a) Zero
- (b) 75 rpm
- (c) 142.5 rpm
- (d) 1500 rpm

Ans: (a)

857. A 3-phase induction motor is running at slip 's'. If its two supply leads are interchanged, then the operating slip at that instant will be:

- (a) 2s
- (c) (2-s)
- (b) (1-s)
- (d) Zero

Ans: (c)

858. Skewing of rotor bars eliminate the:

- (a) Effect of cogging
- (b) Entire effect of crawling
- (c) Magnetic noise
- (d) Vibration due to unequal force developed on rotor

Ans: (a)

859. A 3-phase delta connected squirrel cage induction motor when started with a DOL starter has a starting torque of 600 Nm. Its starting torque when star delta starter is used:

- (a) 600 Nm
- (c) 300 Nm
- (b) 200 Nm
- (d) 1200 Nm

Ans: (b)

860. Which of the following motor has squirrel cage winding on the stator:

- (a) 3 phase squirrel cage induction motor
- (b) Single phase squirrel cage pump motor
- (c) Single phase ceiling fan induction motor
- (d) Single phase table fan induction motor

Ans: (c)

861. A 6-pole, 50 Hz, 3- Φ induction motor is running at 950 rpm and has rotor copper loss of 5 kW. Its rotor input is kW

- (a) 100
- (b) 10
- (c) 95
- (d) 5.3

Ans: (a)

862. What is the frequency of an alternator, if A= number of poles and B = revolution made per Second?

- (a) AB Hz
- (b) AB/4 Hz
- (c) AB/2 Hz
- (d) None of these

Ans: (c)

863. The starting torque can be obtained in case of single phase induction motor with identical main and auxiliary windings by connecting

- (a) A capacitors across the mains
- (b) A capacitor in series with the machine
- (c) A capacitor in series with the auxiliary winding
- (d) The main and auxiliary winding in series

Ans: (c)

864. When the load on an induction motor is increased from no load to full load:

- (a) Both slip and power factor decrease
- (b) Both slip and power factor increase
- (c) Slip decreases and power factor increases
- (d) Slip increases and power factor decreases

Ans: (b)

865. Which of the following statements is correct regarding the actual voltage which is used for setting up the useful flux in the air gap of a 3- phase induction motor?

- (a) It is equal to applied voltage
- (b) It is greater than applied voltage
- (c) It is less than applied voltage
- (d) It is equal to rotor induced emf

Ans: (a)

866. Among the following types of single phase induction motor which one has the highest power factor at full load?

- (a) Shaded pole type
- (b) Split-phase type
- (c) Capacitor-start type
- (d) Capacitor-run type

Ans: (d)

867. The thermal loading on the motor can be determined by:

- (a) Duty/Load cycle
- (b) Temperature of the winding
- (c) Age of the motor
- (d) Ambient conditions

Ans: (a)

868. A torque is developed in an electro mechanical energy conversion device, the value of which depends upon:

- (a) Stator field strength and torque angle

- (b) Stator field and rotor field strengths
- (c) Stator field and rotor field strengths and the torque angle
- (d) Stator field strength only

Ans: (c)

869. Which of the following methods could be used to start a three-phase cage-type induction motor?

- I. Direct-on-line starting
- II. Auto-transformer starting
- III. Star-delta starting

Choose the correct answer from the options given below.

- (a) Only I and II
- (b) Only II and III
- (c) I, II and III
- (d) Only I and III

Ans: (c)

870. What phenomenon is depicted by cross-field theory in context of single-phase induction motors?

- (a) How the rotor develops torque
- (b) How the stator develops torque
- (c) How the rotor develops current
- (d) How the stator develops current.

Ans: (a)

871. Which of the following is not a type of single phase induction motor?

- (a) Resistance split phase type
- (b) Capacitor split phase type
- (c) Shaded pole type
- (d) Opaque pole type

Ans: (d)

872. What will be the frequency (cycles per second) of AC voltage of a 10 pole AC generator which rotates at 1200 rpm?

- (a) 100
- (b) 135
- (c) 150
- (d) 168

Ans: (a)

873. The emf induced in a coil of N turns is given by

- (a) $e = Ndt/d\phi$
- (b) $e = -Nd\phi/dt$
- (c) $e = Nd\phi/dt$
- (d) $e = d\phi/dt$

Ans: (b)

874. The synchronous speed of linear induction motor depends on

- (a) Width of the pole pitch
- (b) Number of poles

- (c) Supply frequency
- (d) Both (a) and (c)

Ans: (d)

875. Compensating winding is used in:

- (a) Capacitor start motor
- (b) Shaded pole motor
- (c) AC series motor
- (d) Capacitor run motor

Ans: (c)

876. The three phase induction motor stator windings is displaced by _ from each other.

- (a) 45° electrical
- (b) 30° electrical
- (c) 120° electrical
- (d) 90° electrical

Ans: (c)

877. A three phase induction motor is wound for 4 pole and is supplied from 50 Hz system. Calculate synchronous speed.

- (a) 1550 rpm
- (b) 1500 rpm
- (c) 1440 rpm
- (d) 1400 rpm

Ans: (b)

878. A 4 pole, 50 Hz induction motor operates at 5% slip. The frequency of emf induced in the rotor will be

- (a) 25 Hz
- (b) 2 Hz
- (c) 2.5 Hz
- (d) 50 Hz

Ans: (c)

879. If the rotor emf per phase at standstill is E_2 and the motor is operating at a slip (s), the generated rotor emf per phase under running condition will be:

- (a) $s^2 E_2$
- (b) E_2
- (c) $s E_2$
- (d) E_2/s

Ans: (c)

880. In case of 3 phase induction motors, plugging is done by:

- (a) Starting the motor on load which is more than the rated load
- (b) Pulling the motor directly on line without a starter
- (c) Interchanging connections of any two phases of stator for quick stopping.
- (d) Locking of rotor due to harmonics

Ans: (c)

881. When the supply voltage to an induction motor is reduced by 10%, the maximum torque will decrease approximately by:

- (a) 10%
- (b) 20%
- (c) 5%
- (d) 40%

Ans: (b)

882. For a single phase capacitor start induction motor which of the following statements is valid?

- (a) The capacitor is used for power factor improvement
- (b) The direction of rotation cannot be changed
- (c) The direction of rotation can be changed by interchanging the supply terminals
- (d) The direction of rotation can be changed by reversing the main winding terminals

Ans: (d)

883. In case of split phase motor, the phase shift between current in the two windings is around-

- (a) 30 degree
- (b) 70 degree
- (c) 90 degree
- (d) 120 degree

Ans: (a)

884. A 230 V, 50 Hz, 4 pole single phase induction motor is rotating in the clockwise forward direction at the speed of 1425 rpm. If the rotor resistance at standstill is 7.8 ohm, then what will be the effective rotor resistance in the backward branch of the equivalent circuit?

- (a) 2 ohm
- (b) 4 ohm
- (c) 78 ohm
- (d) 156 ohm

Ans: (a)

885. The induced e.m.f. will be maximum when a conductor cuts the magnetic field at an angle of

- (a) 15°
- (b) 30°
- (c) 45°
- (d) 90°

Ans: (d)

886. The frequency of an induction motor having synchronous speed of 600 rpm is 40 Hz. Find the number of poles.

- (a) 6
- (b) 12
- (c) 8
- (d) 4

Ans: (c)

887. Slip rings and brushes are found in:

- (a) Wound rotor

- (b) Squirrel cage rotor
- (c) Both of the above
- (d) Neither wound nor squirrel cage rotor

Ans: (a)

888. If there are no copper losses in the rotor, then

- (a) Rotor will not run
- (b) Rotor will run at a very low speed
- (c) Rotor will run at a very high speed
- (d) Rotor will run at synchronous speed

Ans: (d)

889. An induction machine works at generating mode when slip is:-

- (a) Zero
- (b) 0 -1
- (c) More than one
- (d) Negative

Ans: (d)

890. braking is generally used in braking of battery operated scooters.

- (a) Plugging
- (b) Regenerative
- (c) Mechanical
- (d) Rheostatic

Ans: (c)

891. In an Induction motor, number of stator slots should never be equal to number of rotor slots in order to prevent:

- (a) Crawling
- (b) Cogging
- (c) Over heating
- (d) Humming sound

Ans: (b)

892. Speed control of single phase series motor (AC) can be done by:

- (a) Pole changing
- (b) Frequency variation
- (c) Voltage variation
- (d) Shifting of brushes

Ans: (c)

893. are employed for the operation of Jaw Crushers.

- (a) DC shunt wound motor
- (b) Squirrel cage induction motor
- (c) Belted slip ring induction motor
- (d) Any DC motor

Ans: (c)

894. Slip of an induction motor when the rotor starts gaining speed.

- (a) Remains same
- (b) Increases
- (c) Decreases
- (d) Increases or decreases

Ans: (c)

895. Starting torque of an induction motor is _____ applied voltage.

- (a) Directly proportional to
- (b) Inversely proportional to
- (c) Directly proportional to the square of
- (d) Inversely proportional to the square of

Ans: (c)

896. The advantage of double squirrel cage induction motor over single cage rotor is to improve

- (a) Speed regulation
- (b) Power factor
- (c) Slip
- (d) Starting torque

Ans: (d)

897. The main advantage of distributing the winding in slots is to -----

- (a) Reduce the size of the machine
- (b) Add mechanical strength to the winding
- (c) Reduce the amount of copper required
- (d) Reduce the harmonics in the generated emf

Ans: (d)

898. The frequency of rotor emf of an 4-pole induction motor is 2 Hz. If the supply frequency is 50 Hz, then the motor speed is

- (a) 1500 rpm
- (b) 750 rpm
- (c) 1440 rpm
- (d) 720 rpm

Ans: c

899. Which motor is used in the centrifugal pump?

- (a) Split phase induction motor
- (b) Shaded pole induction motor
- (c) Squirrel cage rotor
- (d) Capacitor start/Capacitor run induction motor

Ans: (a)

900. Which law is a consequence of the law of conservation of energy?

- (a) Lenz's law
- (b) Moore's law
- (c) Faraday's law
- (d) Kepler's law

Ans: (a)

901. At what angle difference is the main winding and the start winding separated in a split phase capacitor start induction motor?
- (a) 30° mechanical
 - (b) 90° electrical
 - (c) 45° electrical
 - (d) 45° mechanical

Ans: (b)

902. The bearings used to support the rotor shafts are generally
- (a) Ball bearings
 - (b) Bush bearings
 - (c) Magnetic bearings
 - (d) Needle bearings

Ans: (a)

903. Which of the following can be obtained by equivalent circuit of an induction machine?
- (a) Complete performance characteristics of the machine
 - (b) Temperature rise in the core
 - (c) Type of protection used in the machine
 - (d) Design parameters of the winding

Ans: (a)

904. A 3-phase induction motor when started picks up speed but runs stably at about half the normal speed. This is because of:
- (a) Unbalance in the supply voltages
 - (b) Non-sinusoidal nature of the supply voltage
 - (c) Stator circuit asymmetry
 - (d) Rotor circuit asymmetry

Ans: (b)

905. In an induction motor, at speed near to synchronous speed, the torque speed and torque- slip curves are approximately:
- (a) Hyperbola
 - (b) Parabola
 - (c) Ellipses
 - (d) Straight lines

Ans: (d)

906. If rotor resistance in an induction motor is small, rotor current will be:
- (a) Zero
 - (b) Low
 - (c) Large
 - (d) Infinite

Ans: (c)

907. Slip of an induction motor when the rotor starts gaining speed:
- (a) Remains same
 - (b) Increases
 - (c) Decreases

(d) Increases or decreases

Ans: (c)

908. In a capacitor start motor, the phase displacement starting and running winding can be nearly (in degrees):

(a) 10

(b) 30

(c) 60

(d) 90

Ans: (d)

909. As compared to D.O.L. starter, Star Delta starter, during starting, operates at

(a) full voltage

(b) 72% of full voltage

(c) 58% of full voltage

(d) 34% of full voltage

Ans: (c)

910. Which starting method is not used in squirrel cage induction motors?

(a) Resistance in rotor circuit

(b) Resistance in stator circuit

(c) Auto-transformer starting

(d) Star delta starting

Ans: (a)

911. A 3 Φ , 460V, 100-hp, 60Hz, 6-pole induction machine delivers rated output power at a slip of 0.05. What is the speed of the rotating air gap field?

(a) 90 rpm

(b) 1710 rpm

(c) 1800 rpm

(d) 1200 rpm

Ans: (d)

912. What is synchronous wattage in an induction motor?

(a) Combined stator and rotor input in watts

(b) Shaft output in watts

(c) Stator input in watts

(d) Rotor input in watts

Ans: (d)

913. The direction of rotation of an ordinary shaded pole single phase induction motor:

(a) Can be reversed by reversing the supply terminal connections to the stator winding

(b) Cannot be reversed

(c) Can be reversed by open-circuiting the shading ring

(d) Can be reversed by short-circuiting the shading ring

Ans: (b)

914. The rotor of an induction motor cannot run at synchronous speed because:

- (a) Stator flux would then become zero.
- (b) Losses would increase
- (c) Rotor torque would then become zero
- (d) Induction rotor would then become synchronous motor.

Ans: (c)

915. In direct on line starter, no volt release is to:

- (a) Safe guard against supply fluctuations
- (b) Safe guard the motor against sudden failure of supply
- (c) Safe guard against over load
- (d) Safe guard against earth faults

Ans: (b)

916. The motor used in electric traction is

- (a) DC shunt motor
- (b) Single phase induction
- (c) Three phase induction motor
- (d) Synchronous motor

Ans: (c)

917. To avoid cogging in induction motor, the number of rotor slots should not be the number of rotor slots-

- (a) Greater than
- (b) Dependent on
- (c) Equal to
- (d) Less than

Ans: (c)

918. Rotor of an induction motor always runs at:

- (a) More than synchronous speed
- (b) Any speed as required
- (c) Synchronous speed
- (d) Less than synchronous speed

Ans: (d)

919. A three phase 50 Hz, 440 V, Induction motor has a speed of 950 rpm. If the machine has 6 poles, the percentage slip would be:

- (a) 10%
- (b) 5%
- (c) 1%
- (d) 0.5%

Ans: (b)

920. A 0.5 HP, 6 pole wound rotor induction motor is excited by a 3-phase 60 Hz source. Calculate the frequency of the rotor current at standstill.

- (a) 50Hz
- (b) 30Hz
- (c) 60Hz
- (d) 120Hz

Ans: (c)

921. In a 3-phase induction motor, a deep bar rotor is used for obtaining-
- (a) More starting torque
 - (b) Reduced rotor loss
 - (c) More pull out torque
 - (d) More starting speed

Ans: (a)

922. In an induction motor the slip power recovery schemes can be used
- (a) In constant power drive only
 - (b) In constant torque drive only
 - (c) In both constant power and constant torque drives
 - (d) None of the other options

Ans: (c)

923. A 3 phase, 4 pole squirrel cage induction motor has 36 stator and 28 rotor slots. The number of phase in the rotor is-
- (a) 3
 - (b) 9
 - (c) 7
 - (d) 8

Ans: (c)

924. A 4 pole induction motor, supplied by a slightly unbalanced three phase 50 Hz source is rotating at 1440 rpm. What is the electrical frequency in Hz of the induced negative sequence current in the rotor?
- (a) 100 Hz
 - (b) 98 Hz
 - (c) 52 Hz
 - (d) 48 Hz

Ans: (b)

925. An induction motor at 50 Hz with 1000 rpm speed; will have:
- (a) 8 poles
 - (b) 6 poles
 - (c) 4 poles
 - (d) 2 poles

Ans: (b)

926. For a single phase capacitor start induction motor which of the following is valid?
- (a) Rotation can be changed by reversing main winding terminals
 - (b) Direction of rotation cannot be changed.
 - (c) Rotation can be changed by interchanging supply terminals
 - (d) None of these

Ans: (a)

927. No load test on a three-phase squirrel cage induction motor at rated voltage is performed to obtain:

- (a) Stator and rotor resistance and reactance
- (b) Series branch parameters of equivalent circuit
- (c) Copper and core losses
- (d) Shunt branch parameters of equivalent circuit

Ans: (d)

928. A three phase squirrel cage induction motor of rating 4 pole, 3-phase, 50Hz, 5 kW, runs at a speed of 1440 rpm. The frequency of the rotor current is:

- (a) 49 Hz
- (b) 2 Hz
- (c) 50 Hz
- (d) 51 Hz

Ans: (b)

929. A single-phase induction motor is

- (a) Inherently self-starting with high torque
- (b) Inherently self-starting with low torque
- (c) Inherently non-self starting with low torque
- (d) Inherently non-self-starting with high torque

Ans: (c)

930. Which of the following are constant losses in Transformers?

- (a) Winding losses
- (b) Core losses
- (c) Both Winding & core losses
- (d) None of these

Ans: (b)

931. Two transformers with identical voltage ratings are working in parallel to supply common load. The percentage impedance of one transformer is higher compared to that of other. The load sharing between the two transformers will:

- (a) Be proportional to their percentage impedance
- (b) Be independent of their percentage impedance
- (c) Be inversely proportional to their respective impedance
- (d) Depend on the resistance to leakage reactance ratio of each transformer

Ans: (c)

932. When two transformer of different kVA rating are connected in parallel they share the load in proportion to their respective kVA rating only when their:

- (a) kVA rating are identical
- (b) Efficiencies are equal
- (c) pu impedance are equal
- (d) Equivalent impedance are equal

Ans: (c)

933. Hysteresis loss in a transformer depends upon:

- (a) Frequency

- (b) Supply voltage
- (c) Square of the frequency alone
- (d) Square of the voltage alone

Ans: (a)

934. A 2000/200 V, 20 kVA transformer has 66 turns in the secondary. The number of primary turns is:

- (a) 660
- (b) 440
- (c) 770
- (d) 330

Ans: (a)

935. Open circuit test on a transformer gives:

- (a) Total loss
- (b) Insulation resistance
- (c) Core loss
- (d) Cu loss

Ans: (c)

936. High silicon content steel is used for transformer core construction, to:

- (a) Improve cooling of core and yoke
- (b) Reduce hysteresis loss
- (c) Reduce eddy current loss
- (d) Reduce weight of steel

Ans: (c)

937. A magnetizing force of 800 AT/m will produce a flux density in air.

- (a) 0.5 Wb/m²
- (b) 1 Wb/m²
- (c) 10 mWb/m²
- (d) 1 mWb/m²

Ans: (d)

938. The rating of transformers is expressed in:

- (a) kVA
- (b) kW
- (c) HP
- (d) kWh

Ans: (a)

939. Iron loss of a transformer can be measured by

- (a) Low power factor wattmeter
- (b) Unity power factor wattmeter
- (c) Frequency meter
- (d) Any type of wattmeter

Ans: (a)

940. Varnishes protect the insulating materials against
- (a) oil
 - (b) Moisture, dirt and oil
 - (c) Moisture and fire hazards
 - (d) None of the above
- Ans: (b)**
941. A transformer having 1000 turns in primary winding is connected to a single phase 250 V a.c. supply. For inducing 400 V in secondary winding, the number of turns in secondary winding must be
- (a) 1600
 - (b) 1250
 - (c) 400
 - (d) 250
- Ans: (a)**
942. A 10 kVA, 220 V/220 V, 50 Hz transformer shows 340 W in short circuit test and 168 W in open circuit test. Its efficiency at full load and 0.8 power factor lagging is approximately
- (a) 92%
 - (b) 94%
 - (c) 96%
 - (d) 98%
- Ans: (b)**
943. At light load, the efficiency of a transformer is low. It is because
- (a) Copper loss is small.
 - (b) Copper loss is high.
 - (c) Secondary output is low.
 - (d) Fixed loss is high with respect to output.
- Ans: (d)**
944. The condition for parallel operation of two single phase transformers is that they should have the same
- (a) Polarity & Voltage ratio
 - (b) kVA rating
 - (c) kW rating
 - (d) Percentage impedance
- Ans: (a)**
945. A transformer has negative voltage regulation when its load power factor is
- (a) Zero
 - (b) Leading
 - (c) Unity
 - (d) Lagging
- Ans: (b)**
946. The no load current in a transformer lags the supply voltage by
- (a) 0°
 - (b) 90°

- (c) 110°
- (d) about 75°

Ans: (d)

947. The heat run test of a transformer without its loading is performed by means of

- (a) Short circuit test
- (b) Open circuit test
- (c) Half time short circuit test and half time open circuit test
- (d) Sumpner's test

Ans: (d)

948. Distribution transformers is designed to have maximum efficiency at:

- (a) Full load
- (b) No load
- (c) About 90% of the full load
- (d) About 50% of the full load

Ans: (d)

949. Which of the following part of a transformer consists of a small vessel which contains a drying agent?

- (a) Conservator
- (b) Breather
- (c) Oil tank
- (d) Endings

Ans: (b)

950. The voltage regulation of a transformer having 4% resistance and 5% reactance at full load, 0.8 pf lagging is:

- (a) 4.60%
- (b) -4.6%
- (c) -6.2%
- (d) 6.20%

Ans: (d)

951. A 2 kVA transformer has iron-loss of 100 W and full load copper loss of 200 W. The full load efficiency at unity power factor will be

- (a) 90.90%
- (b) 85.60%
- (c) 80.60%
- (d) 86.95%

Ans: (d)

952. Two transformers are connected in parallel. These transformers do not have equal percentage impedance which results

- (a) Short-circuiting of the secondaries
- (b) Power factor of one of the transformers is leading while that of the other lagging.
- (c) Transformers having higher copper losses will have negligible core losses.
- (d) Loading of the transformers not in proportional to their kVA ratings.

Ans: (d)

953. The function of oil in a transformer is to provide
- (a) Insulation and cooling
 - (b) Protection against lighting
 - (c) Protection against short circuit
 - (d) Lubrication
- Ans: (a)**
954. The transformer laminations are insulated from each other by:
- (a) Mica strip
 - (b) Thin coat of varnish
 - (c) Paper
 - (d) Copper sheets
- Ans: (b)**
955. Eddy current loss in a transformer is proportional to:
- (a) Frequency
 - (b) Supply Voltage
 - (c) Square of the frequency
 - (d) Square of the voltage
- Ans: (c)**
956. In a transformer, if the iron losses and copper losses are 32.8 kW and 50 kW respectively, then at what fraction of load will the efficiency be maximum?
- (a) 0.81
 - (b) 0.57
 - (c) 0.7
 - (d) 0.9
- Ans: (a)**
957. What does the Eddy current loss depend on?
- (a) Flux density
 - (b) Frequency
 - (c) Thickness
 - (d) All of these
- Ans: (d)**
958. A 20,000 kVA transformer with 10% reactance will have a reactance of at 10,000 kVA base.
- (a) 10%
 - (b) 20%
 - (c) 15%
 - (d) 5%
- Ans: (d)**
959. What can we reduce by using thin laminations in a machine?
- (a) Hysteresis losses
 - (b) Iron losses

- (c) Eddy current losses
- (d) Copper losses

Ans: (c)

960. Which law states that an e.m.f is induced in a conductor whenever it cuts the flux?

- (a) Gauss's law for magnetism
- (b) Lenz's law of electromagnetic induction
- (c) Faraday's law of electromagnetic induction
- (d) Lorentz force law

Ans: (c)

961. A property of a transformer which makes it ideal is.

- (a) CRGO core for its primary and secondary windings
- (b) No losses and magnetic leakage
- (c) Interleaved primary and secondary windings
- (d) None of these

Ans: (b)

962. Reason for using silicon steel in electrical machines?

- (a) High retentivity
- (b) High coercivity
- (c) Low hysteresis loss
- (d) Low coercivity

Ans: (c)

963. A 25 kVA, 3300 /230 V, single phase transformer has iron and copper losses of 350 W and 400W. The efficiency at 0.8 p.f is

- (a) 96.39%
- (b) 97.09%
- (c) 98.43%
- (d) 98.04%

Ans: (a)

964. To minimise loss due to hysteresis, the magnetic material should have?

- (a) High resistivity
- (b) High retentivity
- (c) Low hysteresis coefficient
- (d) Large B-II loop area

Ans: (c)

965. The most common method of cooling employed in power transformer is:

- (a) Oil natural
- (b) Natural cooling
- (c) Air cooling
- (d) Air-blast cooling

Ans: (a)

966. Laminations of core are generally made of

- (a) case iron

- (b) carbon
- (c) silicon steel
- (d) stainless steel

Ans: (c)

967. Which of the following does not change in a transformer?

- (a) Current
- (b) Voltage
- (c) Frequency
- (d) All of the above

Ans: (c)

968. In a transformer the energy is conveyed from primary to secondary

- (a) Through cooling coil
- (b) Through air
- (c) By the flux
- (d) None of the above

Ans: (c)

969. Major insulation in a transformer is the insulation between the

- (a) LV winding and core
- (b) LV winding and HV winding
- (c) Turns of the windings
- (d) Both (a) and (b)

Ans: (d)

970. Delta/star transformer works satisfactorily when

- (a) Load is balanced only
- (b) Load is unbalanced only
- (c) On balanced as well as unbalanced loads
- (d) None of the above

Ans: (c)

971. Transformer breaths in when

- (a) Load on it increases
- (b) Load on it decreases
- (c) Load remains constant
- (d) None of the above

Ans: (b)

972. No-load current of a transformer

- (a) Has high magnitude and low power factor
- (b) Has high magnitude and high power factor
- (c) Has small magnitude and high power factor
- (d) Has small magnitude and low power factor

Ans: (d)

973. The purpose of providing iron core in a step-up transformer is

- (a) To provide coupling between primary and secondary

- (b) To increase the magnitude of mutual flux
- (c) To decrease the magnitude of magnetizing current
- (d) To provide all above features

Ans: (d)

974. Two transformers operating in parallel will share the load depending upon their

- (a) Leakage reactance
- (b) Per unit impedance
- (c) Efficiencies
- (d) Ratings

Ans: (b)

975. Which winding of the transformer has less cross sectional area?

- (a) Primary winding
- (b) Secondary winding
- (c) Low voltage winding
- (d) High voltage winding

Ans: (d)

976. Power transformers are generally designed to have maximum efficiency around

- (a) No-load
- (b) Half-load
- (c) Near full-load
- (d) 10% overload

Ans: (c)

977. Which of the following is the main advantage of an auto-transformer over a two winding transformer?

- (a) Hysteresis losses are reduced
- (b) Saving in winding material
- (c) Copper losses are negligible
- (d) Eddy losses are totally eliminated

Ans: (b)

978. When a given transformer is run at its rated voltage but reduced frequency, its Flux density remains unaffected

- (a) Iron losses are reduced
- (b) Core flux density is reduced
- (c) Core flux density is increased

Ans: (d)

979. An ideal transformer will have maximum efficiency at a load such that

- (a) Copper loss = iron loss
- (b) Copper loss < iron loss
- (c) Copper loss > iron loss
- (d) None of the above

Ans: (a)

980. If the supply frequency to the transformer is increased, the iron loss will

- (a) Not change
- (b) Decrease
- (c) Increase
- (d) Any of the above

Ans: (c)

981. The no load primary input is approximately equal to the

- (a) Iron loss of transformer
- (b) Sum of Iron loss and copper loss of transformer
- (c) Neither Iron loss of transformer nor copper loss
- (d) Copper loss of transformer

Ans: (a)

982. Regulation of a transformer is defined by rise in primary voltage required to maintain rated output voltage at a given power factor for a lagging power factor load:

- (a) From no load to 50% of full load
- (b) From no load to full load
- (c) From no load to 25% of full load
- (d) From no load to 75% of full load

Ans: (b)

983. A 1 Φ , 10 kVA, 220/110V, 50Hz transformer is connected to a 220V supply. It draws rated current at 0.8 p.f. leading. The transformer may be considered ideal. What is the kVA rating of the load?

- (a) 10
- (b) 20
- (c) 15
- (d) 8

Ans: (a)

984. If the voltage ratio of the transformer is 1:30 then the ratio of primary and secondary turns will be

- (a) 2:30
- (b) 1:30
- (c) 1:3
- (d) 2:10

Ans: (b)

985. Which quantity is preferred as a reference vector to draw a Phasor diagram in a series circuit?

- (a) Phase angle
- (b) Current
- (c) Power
- (d) Voltage

Ans: (b)

986. All day efficiency of a transformer is defined as the ratio of output to input in -

- (a) kVA at particular instant
- (b) kWh during 24 hours
- (c) kVARh at particular instant

(d) kW during 24 hours

Ans: (b)

987. A 2000/200 V, 20 kVA transformer has 66 turns in the secondary. The number of primary of turns are:

(a) 660

(b) 440

(c) 770

(d) 330

Ans: (a)

988. A transformer has efficiency of 80% and works at 100V and 4 kW. If the secondary voltage is 240V, find the primary current.

(a) 16.67 A

(b) 40 A

(c) 30 A

(d) 10 A

Ans: (b)

989. The full load efficiency at unity power factor of a 230/115 V, 2 kVA single phase transformer having a C_u loss of 60W at half load and iron loss of 50 W is:

(a) 92%

(b) 87%

(c) 90%

(d) 98%

Ans: (b)

990. Find the line current under measurement, if a 100:5 CT is used in conjunction with a (0-5A) ammeter reads 3A.

(a) 70 A

(b) 35 A

(c) 60 A

(d) 15 A

Ans: (c)

991. Current transformers (CT) are used for:

(a) Measurement of frequency

(b) Measurement of large DC currents

(c) Measurement of large alternating currents

(d) Measurement of high voltage

Ans: (c)

992. A 3-phase transformer has its primary is delta connected and secondary in star. Secondary to primary turns ratio per phase is 5. What would be the secondary voltage for a primary voltage of 400 V?

(a) 2000 V

(b) 80 V

(c) 3464 V

(d) 138 V

Ans: (c)

993. The percentage resistance of a 100 kVA, 5kV, 5Ω resistance is given by:

- (a) 2%
- (b) 20%
- (c) 40%
- (d) 4%

Ans: (a)

994. In a transformer having 1000 primary and 400 secondary turns, if the primary voltage is 250 volts, the secondary voltage will be:

- (a) 400 Volts
- (b) 100 Volts
- (c) 625 Volts
- (d) 1600 Volts

Ans: (b)

995. Which test on transformer provides information about regulation efficiency and heating under load conditions?

- (a) Open circuit test
- (b) Back to back test
- (c) Hopkinson test
- (d) Short circuit test

Ans: (b)

996. If the flux density in the core of a transformer is increased

- (a) Frequency on secondary windings will change
- (b) Wave shape on secondary side will be distorted
- (c) Size of transformer can be reduced
- (d) Eddy current losses will be reduced

Ans: (c)

997. Which of the following transformer will be largest in size?

- (a) 1 kVA, 25 Hz
- (b) 1 kVA, 50 Hz
- (c) 1 kVA, 60 Hz
- (d) 1 kVA, 100 Hz

Ans: (a)

998. If the current in the armature of d.c series motor is reduced to 50%, the torque of the motor will become:

- (a) 50% of the previous value
- (b) 25% of the previous value
- (c) 150% of the previous value
- (d) 125% of the previous value

Ans: (b)

999. A 250 V dc motor has an armature resistance of 0.25Ω . It is drawing an armature current of 25A, driving a certain load. Calculate the induced emf in the motor under this condition.

- (a) 180.5 V
- (b) 243.75 V
- (c) 192.5 V
- (d) 625 V

Ans: (b)

1000. Which of the following is the standard requirement of a dc armature winding?

- (a) It should be a closed one
- (b) It should be a lap winding
- (c) It should be a wave winding
- (d) It should be either a wave winding or a lap winding.

Ans: (a)

1001. The poorest voltage regulation exists in which of the following generators?

- (a) Compound generators
- (b) Shunt generators
- (c) Series generators
- (d) High generators

Ans: (c)

1002. What would be the value of pole pitch if there are 80 conductors and 8 poles?

- (a) 640
- (b) 64
- (c) 80
- (d) 10

Ans: (d)

1003. What is the value of flux in the section of yoke, if the pole flux is ϕ weber?

- (a) 2ϕ
- (b) $\sqrt{\phi}$
- (c) $\phi/2$
- (d) ϕ

Ans: (c)

1004. What is the relationship between the speed (N) and armature current (I_a) in case of a dc- series motor?

- (a) $N \propto I_a$
- (b) $N \propto \sqrt{I_a}$
- (c) $N \propto \frac{1}{I_a}$
- (d) $N \propto I_a$

Ans: (a)

1005. The method of speed control of DC shunt motors used for applications where a very wide range sensitive speed control is required is:

- (a) Ward-Leonard System
- (b) Multiple Voltage Control
- (c) Tapped Field Control
- (d) Rheostatic Control

Ans: (a)

1006. The DC shunt motor is running with a certain load. The effect of adding an external resistance in field circuit is to:

- (a) Increase the motor speed
- (b) Stop the motor
- (c) Reduce the motor speed
- (d) Reduce the armature current of the motor

Ans: (a)

1007. In DC motor, the speed depends upon:

- (a) Applied voltage alone
- (b) Back emf alone
- (c) Back emf and flux
- (d) Flux only

Ans: (c)

1008. Three point starter can be used for:

- (a) Both shunt and compound motors
- (b) Shunt motor only
- (c) Series motor only
- (d) Compound motor only

Ans: (a)

1009. Voltage equation of DC motor is given by:

- (a) $V = E_b + I_a R_a$
- (b) $V = E_b - I_a R_a$
- (c) $V = E_b I_a - R_a$
- (d) $V = E_b I_a + R_a$

Ans: (a)

1010. DC motor recommended for locomotive drive is:

- (a) DC series motor
- (b) DC long shunt compound motor
- (c) DC shunt motor
- (d) DC short shunt compound motor

Ans: (a)

1011. Brushes are provided in DC machine for:

- (a) Smooth rotation
- (b) Preventing sparking
- (c) Providing a path for flow of current
- (d) Reducing the losses

Ans: (c)

1012. The field poles and armature core of a dc generator are laminated in order to reduce

- (a) Hysteresis loss
- (b) Eddy current loss
- (c) Weight

(d) Speed

Ans: (b)

1013. The mechanical power developed in a dc motor is equal to

- (a) Power input - core losses
- (b) Power input - mechanical losses
- (c) Armature current x counter e.m.f.
- (d) Armature current x supply voltage

Ans: (c)

1014. A 220 V dc shunt motor is running at 500 rpm when armature current is 50 A. The value of armature resistance is 0.2 ohm. The speed of motor at the double torque will be

- (a) 250 rpm
- (b) 500 rpm
- (c) 1000 rpm
- (d) 476 rpm

Ans: (d)

1015. If numbers of poles in lap wound dc generator are doubled, the generated e.m.f. will be

- (a) Increased by a factor of 2
- (b) Decreased by a factor of 2
- (c) Increased by a factor of 4
- (d) Unchanged

Ans: (d)

1016. A DC series motor has linear magnetization characteristics and negligible armature resistance. The motor speed is

- (a) Directly proportional to T
- (b) Inversely proportional to T
- (c) Directly proportional to T^2
- (d) Inversely proportional to T^2 where T = load torque

Ans: (b)

1017. A 4-pole dc generator runs at 1500 rpm. The frequency of current in armature winding is

- (a) Zero
- (b) 25 Hz
- (c) 50 Hz
- (d) 100 Hz

Ans: (c)

1018. For a dc series motor, which of the following expression is correct assuming torque (T) versus armature current (I_a) characteristics unsaturated?

- (a) $T \propto \sqrt{I_a}$
- (b) $T \propto I_a$
- (c) $T \propto -I_a$
- (d) $T \propto I_a^2$

Ans: (d)

1019. A dc series motor should never be started at

- (a) Normal load condition.
- (b) Full load condition.
- (c) No load condition.
- (d) Slightly overload condition.

Ans: (c)

1020. In a dc generator, 8 parallel paths and 16 brushes for collection of current are used. If voltage drop per brush is 1 V, then reduction in the induced e.m.f. will be

- (a) 2 V
- (b) 4 V
- (c) 8 V
- (d) 16 V

Ans: (d)

1021. The speed control of de shunt motor in both directions can be obtained by:

- (a) Armature resistance control method
- (b) Armature voltage control method
- (c) Field diverter method
- (d) Ward Leonard method

Ans: (d)

1022. The armature resistance of a DC motor is 0.4Ω , the supply voltage is 200 V and the back e.m.f. is 198 V at full speed. The armature current is

- (a) 4A
- (b) 8A
- (c) 5A
- (d) 0.5A

Ans: (c)

1023. If the speed of a DC machine is doubled and the flux remains constant, the generated e.m.f.

- (a) Remains the same
- (b) Is doubled
- (c) Is halved
- (d) Is thrice

Ans: (b)

1024. If the total number of slots in a D. C machine is 25 and the total number of poles is 5, then what is the coil span of the machine?

- (a) 5
- (b) 30
- (c) 20
- (d) 125

Ans: (a)

1025. To save energy during braking, which type of braking is used?

- (a) Regenerative
- (b) Plugging
- (c) Dynamic

(d) All of these

Ans: (a)

1026. Which of the following dc generators is employed in arc welding?

- (a) Shunt
- (b) Cumulative Compound
- (c) Series
- (d) Differential Compound

Ans: (d)

1027. Which one acts as a mechanical rectifier in the process of converting AC current into DC current where the emf is induced in the armature winding?

- (a) Rheostat
- (b) Rotor
- (c) Commutator
- (d) Stator

Ans: (c)

1028. The speed control of DC shunt motor in both the directions can be obtained by

- (a) Armature resistance control method
- (b) Ward Leonard method
- (c) Field diverter method
- (d) Armature voltage control method

Ans: (b)

1029. The speed of a D.C. Motor is directly proportional to

- (a) Armature current
- (b) Field current
- (c) Impressed voltage
- (d) Number of poles

Ans: (a)

1030. A shunt generator gives the greatest voltage at

- (a) No-load
- (b) Full-load
- (c) Open field
- (d) Drooping

Ans: (a)

1031. In D.C. generators, the cause of rapid brush wear may be

- (a) Severe sparking
- (b) Rough commutator surface
- (c) Imperfect contact
- (d) Any of the above

Ans: (d)

1032. A separately excited generator as compared to a self-excited generator

- (a) Is enable to better voltage control
- (b) Is more stable

- (c) Has exciting current independent of load current
- (d) Has all above features

Ans: (d)

1033. Iron losses in a D.C. machine are independent of variations in

- (a) Speed
- (b) Load
- (c) Voltage
- (d) Speed and voltage

Ans: (b)

1034. Brushes of D.C. machines are made of

- (a) Carbon
- (b) Soft copper
- (c) Hard copper
- (d) All of the above

Ans: (a)

1035. The residual magnetism of a self excited dc generator is lost. To build up its emf again the

- (a) Field winding must be replaced
- (b) Armature connection must be reversed
- (c) Field winding connections must be reversed
- (d) Field winding must be excited by low voltage DC supply

Ans: (d)

1036. The insulating material used between the commutator segments is normally

- (a) Graphite
- (b) Paper
- (c) Mica
- (d) Insulating varnish

Ans: (c)

1037. The function of pole shoes in the case of D.C. machine is

- (a) To reduce the reluctance of the magnetic path
- (b) To spread out the flux to achieve uniform flux density
- (c) To support the field coil
- (d) All the above functions

Ans: (d)

1038. Separately excited and self-excited are types of which machine?

- (a) DC machine
- (b) Synchronous machine
- (c) Induction machine
- (d) None of the above

Ans: (a)

1039. If speed of a d.c. shunt motor increases, the back emf -

- (a) Increases
- (b) decreases

- (c) Remains fixed
- (d) Decreases and then increases

Ans: (a)

1040. Which part of DC machines converts the alternating current induced in armature conductors into unidirectional current in the external load circuit?

- (a) Commutator
- (b) Pole coils
- (c) Armature core
- (d) Armature windings

Ans: (a)

1041. A 230 V DC motor takes a current of 40A and runs at 1100 r.p.m. If armature and shunt field resistances are 0.25Ω and 230Ω respectively the back emf will be:

- (a) 220.25 V
- (b) 110.25 V
- (c) 230.25 V
- (d) 115 V

Ans: (a)

1042. A 220 V dc shunt motor is running at 500 rpm when armature current is 50A. The value of armature resistance is 0.2 ohm. The speed of motor at the double torque will be

- (a) 250 rpm
- (b) 500 rpm
- (c) 1000 rpm
- (d) 476 rpm

Ans: (d)

1043. With the increase in speed of a DC motor

- (a) Both back emf as well as line current increase
- (b) Both back emf as well as line current fall
- (c) Back emf increases but line current fall
- (d) Back emf fall and line current increases

Ans: (c)

1044. The torque-speed characteristic of a D.C. shunt motor is

- (a) A rectangular hyperbola
- (b) A drooping straight line
- (c) A parabola
- (d) None of the above

Ans: (b)

1045. Variation in speed by Ward-Leonard control method of D.C. motors occurs due to variation in

- (a) Field excitation
- (b) Armature current
- (c) Armature voltage
- (d) Supply Voltage

Ans: (c)

1046. Ward-Leonard system of speed control is NOT recommended for:

- (a) Frequent motor reversals
- (b) Very low speeds
- (c) Constant speed operation
- (d) Wide speed range

Ans: (c)

1047. Which of the following statement is WRONG regarding cumulative compound Motor?

- (a) Variable speed
- (b) Low starting torque
- (c) Speed control possible
- (d) Adjustable varying speed

Ans: (b)

1048. Drop in alternator frequency is corrected by:

- (a) Damper winding
- (b) Increased prime mover output
- (c) Automatic voltage regulator
- (d) None of these

Ans: (b)

1049. ZPF (Zero power factor) method finds _____ of an alternator.

- (a) Voltage regulation
- (b) Efficiency
- (c) Armature resistance
- (d) Synchronous impedance

Ans: (a)

1050. By reversing the direction of rotation of a synchronous motor can be reversed.

- (a) Supply phase sequence
- (b) Current to the field winding
- (c) Polarity of rotor poles
- (d) Either "polarity of rotor poles" or "supply phase sequence".

Ans: (a)

1051. An alternator's operating principle is quite similar to that of:

- (a) A.C. Generator
- (b) D.C. Generator
- (c) A.C. Inverter
- (d) A.C. Stabilizer

Ans: (b)

1052. What is the value of load angle at a point where power output of a salient pole synchronous generator is maximum?

- (a) 0°
- (b) 45°
- (c) 120°
- (d) It is less than 90° but not fixed

Ans: (d)

1053. When a synchronous motor is it operates with leading power factor current.

- (a) Under-excited
- (b) Critically excited
- (c) Over-excited
- (d) Heavily loaded

Ans: (c)

1054. What will be the effect on a salient pole synchronous motor if its field current is switched off (provided the motor runs at no load)?

- (a) It will stop
- (b) It continues to run at synchronous speed
- (c) It continues to run at a speed slightly more than the synchronous speed
- (d) It continues to run at a speed slightly less than the synchronous speed

Ans: (b)

1055. The following system is used in connections of various lamps and appliances in parallel. Identify the system.

- (a) Gain-in-system
- (b) Loop-in-system
- (c) Voltage-in-system
- (d) Parallel-in-system

Ans: (b)

1056. On which of the following parameters does the power factor of an alternator depend?

- (a) Load
- (b) Speed of rotor
- (c) Core losses
- (d) Armature losses

Ans: (a)

1057. What is the purpose of dampers in a large generator?

- (a) They increase stability
- (b) They reduce voltage fluctuations
- (c) They reduce frequency fluctuations
- (d) They decrease stability.

Ans: (a)

1058. For the following specifications of a synchronous motor, determine the ratio of no load speed to full load speed.

- (a) 2 : 3
- (b) 1 : 1
- (c) 3 : 5
- (d) 2 : 7

Ans: (b)

1059. Let us assume that two alternators running exactly in synchronism. Find the synchronizing power of the system.

- (a) 0
- (b) 1
- (c) 0.8
- (d) 0.5

Ans: (a)

1060. Damping winding in a synchronous motor:

- (a) Improves power factor of the motor
- (b) Increases hunting of the motor
- (c) Reduces windage losses
- (d) Increases starting torque

Ans: (d)

1061. The direction of induced e.m.f. can be found with the help of

- (a) Fleming's right hand rule
- (b) Kirchhoff's voltage law
- (c) Lenz's law
- (d) Laplace's law

Ans: (a)

1062. A 50 Hz alternator will run at the highest speed if it is wound for

- (a) 8 poles
- (b) 6 poles
- (c) 4 poles
- (d) 2 poles

Ans: (d)

1063. Which one of the following methods gives voltage regulation higher than the actual value in an alternator ?

- (a) ZPF method
- (b) mmf method
- (c) emf method
- (d) ASA method

Ans: (c)

1064. The most common type of prime mover used for low speed alternators is

- (a) Steam turbine
- (b) Petrol engine
- (c) Hydraulic turbine
- (d) Diesel engine

Ans: (c)

1065. When speed of an alternator is changed from 3600 rpm to 1800 rpm, the generated emf will be

- (a) One-half
- (b) Twice
- (c) One-fourth
- (d) Four times

Ans: (a)

1066. The power factor of an alternator is determined by its

- (a) Prime mover
- (b) Speed
- (c) Excitation
- (d) Load

Ans: (d)

1067. Two mechanically coupled alternators deliver power at 50 Hz and 60 Hz respectively. The highest speed of alternators is

- (a) 600 rpm
- (b) 500 rpm
- (c) 3000 rpm
- (d) 3600 rpm

Ans: (a)

1068. From no-load to full-load, synchronous motors give:

- (a) Constant speed
- (b) Variable speed
- (c) Gradually increasing speed
- (d) Gradually decreasing speed

Ans: (a)

1069. Alternators are rated at:

- (a) kW
- (b) kVA
- (c) kVA or kW
- (d) kWh

Ans: (b)

1070. To reduce the peripheral speed of an alternator, diameter of the rotor is:

- (a) Increased
- (b) Decreased
- (c) Increased or decreased
- (d) Kept same

Ans: (b)

1071. Which of the following statements is false?

- (a) Silica gel is used in transformers
- (b) Transformer is a constant flux machine
- (c) Induction motor can be self starting
- (d) Synchronous motor is self starting

Ans: (d)

1072. The size of a synchronous motor decreases with the increase in

- (a) Speed
- (b) Horse power rating
- (c) Flux density
- (d) All of these

Ans: (c)

1073. What will be the rotation speed of a 3-phase, 4- pole, 50 Hz synchronous motor, if the frequency number of poles and load torque is halved?

- (a) 3000 RPM
- (b) 750 RPM
- (c) 6000 RPM
- (d) 1500 RPM

Ans: (d)

1074. Stator and rotor fields rotate simultaneously in which of the following motors?

- (a) Universal motor
- (b) Synchronous motor
- (c) D.C. motor
- (d) Reluctance motor

Ans: (b)

1075. In which of the following conditions will a 3-phase synchronous machine works as a capacitor?

- (a) Over Excited
- (b) Critically Excited
- (c) Under Excited
- (d) None of these

Ans: (a)

1076. What is the role of alternator in a steam power station?

- (a) It converts electrical energy into mechanical energy
- (b) It converts heat energy to mechanical energy
- (c) It converts heat energy to electrical energy
- (d) It converts mechanical energy into electrical energy

Ans: (d)

1077. What is the Synchronising power of a synchronous machine?

- (a) Directly proportional to the synchronous reactance
- (b) Equal to the synchronous reactance
- (c) Inversely proportional to the synchronous reactance
- (d) None of these

Ans: (c)

1078. What the damper bars develops, when the rotor speed, in a synchronous machine, becomes more than the synchronous speed during hunting?

- (a) Inductor motor torque
- (b) Induction generator torque
- (c) D.C. motor torque
- (d) Synchronous motor torque

Ans: (b)

1079. A synchronous motor can operate at

- (a) Lagging power factor only
- (b) Lagging, leading and unity power factors

- (c) Leading power factor only
- (d) None of these

Ans: (b)

1080. According to Fleming's right hand rule, what does the thumb indicate?

- (a) Direction of the motion of the conductor relative to the magnetic field
- (b) Direction of the induced or generated current within the conductor
- (c) Direction of the magnetic field
- (d) None of these

Ans: (a)

1081. The constant speed of a synchronous motor can be changed to new fixed value by which of the following methods?

- (a) By changing the applied voltage
- (b) By interchanging any two phases
- (c) By changing the supply frequency
- (d) All of these

Ans: (c)

1082. Which of the following generator is used in the thermal power plant?

- (a) Turbo generator
- (b) Synchronous motor
- (c) Non-salient pole synchronous generator
- (d) Salient pole synchronous generator

Ans: (c)

1083. Calculate the frequency in Hz of a 10-pole AC generator which rotates at 1800 rpm.

- (a) 120
- (b) 100
- (c) 150
- (d) 180

Ans: (c)

1084. If field current of a three phase alternator is reversed, what happens to its phase sequence?

- (a) Remains same
- (b) Reverses
- (c) Two phases are exchanged
- (d) It becomes ac motor

Ans: (a)

1085. A 10 pole, 25 Hz alternator is directly coupled to and is driven by 60 Hz synchronous motor. Then the number of poles in a synchronous motor is

- (a) 12 poles
- (b) 48 poles
- (c) 24 poles
- (d) 6 poles

Ans: (c)

1086. Which of the following phenomenon shows the regulation of an alternator?

- (a) The increase in terminal voltage when load is thrown off
- (b) The variation of terminal voltage under the conditions of over and under excitation
- (c) Terminal voltage at zero power factor
- (d) The reduction in terminal voltage when alternator is on full load

Ans: (a)

1087. The synchronous motor has

- (a) Constant speed
- (b) Variable speed
- (c) Constant poles
- (d) Constant size

Ans: (a)

1088. Which of the following motors one will choose to drive the rotary compressor?

- (a) D.C. shunt motor
- (b) D. C. series motor
- (c) Universal motor
- (d) Synchronous motor

Ans: (d)

1089. Negative voltage regulation is indicative that the load is

- (a) Capacitive only
- (b) Inductive only
- (c) Inductive or resistive
- (d) None of the above

Ans: (a)

1090. As load p.f. of an alternator becomes more leading, the value of generated voltage required to give rated terminal voltage

- (a) Increases
- (b) Remains unchanged
- (c) Decreases
- (d) Varies with rotor speed

Ans: (c)

1091. Synchronous condenser means

- (a) A synchronous motor with capacitor connected across stator terminals to improve PF
- (b) A synchronous motor operating at full load with leading PF
- (c) An over excited synchronous motor partially supplying mechanical load and also improving PF of the system to which it is connected
- (d) An over excited synchronous motor operating at no load with leading PF to improve the PF of the system

Ans: (d)

1092. In alternators during armature reaction the effect of armature flux on main flux with unity power factor is:

- (a) Cross magnetising
- (b) Wholly demagnetising

- (c) Partially magnetising
- (d) Wholly magnetising

Ans: (a)

1093. An integral number of slots per pole is often used in an alternator in order to:

- (a) Eliminate harmonics in the waveform
- (b) Provide insulation
- (c) Permit easy installation of stator coils
- (d) Provide easy removal in case of repair

Ans: (a)

1094. Damper in a large generator is used to:

- (a) Increase stability
- (b) Reduce voltage fluctuation
- (c) Reduce frequency fluctuation
- (d) All above

Ans: (a)

1095. Harmonics present in alternators affect:

- (a) Pitch factor
- (b) Chording factor
- (c) Neither Chording factor nor pitch factor
- (d) Chording factor and pitch factor

Ans: (d)

1096. Synchronous generator can reactive power:

- (a) Neither generates nor absorbs
- (b) Absorb
- (c) Generate and absorb
- (d) Generate

Ans: (c)

1097. An alternator has:

- (a) Rotating armature and stationary field
- (b) Stationary armature and stationary field.
- (c) Rotating armature and rotating field
- (d) Stationary armature and rotating field

Ans: (d)

1098. To determine voltage regulation of an alternator the following experimental results are required:

- (a) Short circuit characteristic and open circuit characteristic
- (b) Open circuit characteristic and armature impedance
- (c) Armature impedance
- (d) Short circuit characteristic and open circuit characteristic and Armature impedance

Ans: (d)

1099. To reduce the peripheral speed of an alternator, diameter of the rotor is:

- (a) Increased

- (b) Decreased
- (c) Increased or decreased
- (d) Kept same

Ans: (b)

1100. What is the frequency of voltage generated by an alternator having 6-poles and rotating at 900 rpm?

- (a) 50 rad/s
- (b) 50 Hz
- (c) 45 Hz
- (d) 45 rad/s

Ans: (c)

1101. The speed of two pole alternator at 60 Hz is-

- (a) 3600 rpm
- (b) 750 rpm
- (c) 300 rpm
- (d) 1500 rpm

Ans: (a)

1102. The distribution or winding factor is defined in an alternator in terms of-

- (a) Power factor
- (b) Electromotive force
- (c) Power
- (d) Current

Ans: (b)

1103. In case of leading load power factor, the terminal voltage of an alternator will

- (a) Fall on removing the full load
- (b) Rise on removing the full load
- (c) Rise on adding the full load
- (d) Fall on adding the full load

Ans: (a)

1104. A magnetic flux of 300 m Wb in a coil of 100 turns is reverted in 0.2 seconds. The average emf induced is

- (a) 600 V
- (b) -300 V
- (c) -600 V
- (d) 300 V

Ans: (d)

1105. Distributed winding and short chording employed in AC machines will result in;

- (a) Reduction in both emf and harmonics emf
- (b) Reduction in emf and increase in harmonics emf
- (c) Increase in both emf and harmonics emf

(d) Increase in emf and reduction in harmonics emf

Ans: (a)

1106. An alternator has a phase sequence of RYB for its phase voltages. In case the field current is reversed the phase sequence will become:

- (a) RBY
- (b) RYB
- (c) YRB
- (d) None of the above

Ans: (b)

1107. What is the pitch factor of a 4 pole alternator having 36 slots and a coil span of 1 to 8 ?

- (a) 140°
- (b) 80°
- (c) 20°
- (d) 40°

Ans: (d)

1108. A 3 Phase, 60 Hz generator connected in Y connection, generated a line to line voltage of 23900V Calculate the peak line voltage.

- (a) 13800 V
- (b) 33800 V
- (c) 42300 V
- (d) 23900 V

Ans: (b)

1109. An alternator is feeding an infinite bus bar. Its prime mover is suddenly shutdown. The alternator will:

- (a) Continue to work as alternator but the direction of rotation will reverse.
- (b) Come to stand still
- (c) Continue to work as synchronous motor and direction of rotation will also be same
- (d) Will work as an induction motor

Ans: (c)

1110. An alternator is connected to an infinite bus. If its field current is decreased then its armature current will be-

- (a) Increase with zero pf lagging
- (b) Decreases with zero pf leading
- (c) Increases with zero pf leading
- (d) None of the other options

Ans: (c)

1111. A synchronous generator has higher power handling capacity when operating -----

- (a) At lagging power factor
- (b) At leading power factor
- (c) At unity power factor
- (d) Independent of power factor

Ans: (c)

1112. A 6 pole, 3-phase alternator running at 1000 rpm supplies to an 8-pole, 3-phase induction motor which has a rotor current of frequency 2 Hz. The speed at which the motor operates is:-
- (a) 100 rpm
 - (b) 970 rpm
 - (c) 750 rpm
 - (d) 720 rpm

Ans: (b)

1113. Maximum speed of a synchronous machine for 50 Hz is:

- (a) 1500 rpm
- (b) 3000 rpm
- (c) 20000 rpm
- (d) 30000 rpm

Ans: (b)

1114. We have assigned a frequency of 50 Hz to power system because it

- (a) Can be easily obtained
- (b) Gives best result when used for operating both lights and machinery
- (c) Easy calculations
- (d) None

Ans: (b)

1115. Direction of the alternating e.m.f. produced in the stator conductors of an alternator is given by:

- (a) Lenz's law
- (b) Flemings left hand rule
- (c) Fleming's right hand rule
- (d) Kirchoff's Law

Ans: (c)

1116. On which of the following parameters does the power factor of an alternator depend?

- (a) Load
- (b) Speed of rotor
- (c) Core losses
- (d) Armature losses

Ans: (a)

1117. The integration of a three phase Alternator with the infinite grid requires which quantities to be the same?

- (a) Voltage
- (b) Frequency
- (c) Phase sequence
- (d) All of the above

Ans: (d)

1118. The main disadvantage with Nickel-Cadmium cells is

- (a) They have a high-energy density
- (b) They can be recharged more times than other types of rechargeable batteries
- (c) They have to be fully discharged before charging, because they suffer from a memory effect
- (d) All the above

Ans: (c)

1119. works on the chemical effects of current

- (a) Power factor meter
- (b) Voltmeter
- (c) DC ampere hour meter
- (d) Wattmeter

Ans: (c)

1120. Which of the following batteries does not require trickle charging?

- (a) Lead acid cell
- (b) Alkaline cell
- (c) Lead acid and Alkaline cell both
- (d) Neither lead acid nor alkaline cell

Ans: (b)

1121. The most common used primary cell is

- (a) Lithium cell
- (b) Nickel iron cell
- (c) Lead acid cell
- (d) Nickel cadmium cell

Ans: (a)

1122. In dry cells, electrons are released at

- (a) Cathode and anode both
- (b) Outside the electrolyte chamber
- (c) Anode
- (d) Cathode

Ans: (c)

1123. Salt solutions are

- (a) Insulators
- (b) Semi-conductors
- (c) Good conductors of electricity
- (d) Do not possess electrical properties

Ans: (c)

1124. Positive Electrode of a dry cell is made of

- (a) Copper
- (b) Carbon
- (c) Zinc
- (d) Sulphur

Ans: (b)

1125. Generally the Leclanche cell is used for

- (a) Continuous purposes
- (b) Heavy purposes
- (c) Low purposes
- (d) Intermittent purposes

Ans: (d)

1126. A solar cell is

- (a) Same as photometer
- (b) Same as a photo emissive cell
- (c) Same as photo conductive cell
- (d) Same as photo voltatic cell

Ans: (d)

1127. Internal resistance of a cell depends on

- (a) Terminal voltage
- (b) Torque
- (c) Current
- (d) Area of the plates

Ans: (d)

1128. What will be the energy used by the battery if the battery has to deliver 6.28×10^{18} electrons with potential difference of 20 V across the terminal?

- (a) 5 J
- (b) 10 J
- (c) 15 J
- (d) 20 J

Ans: (d)

1129. The usable capacity of a battery-----

- (a) Increases with increased discharge current
- (b) Decreases with increased discharge current
- (c) Is independent of discharge current
- (d) Depends on discharge time

Ans: (b)

1130. Which one of the following sources of energy does a fuel cell consist of ?

- (a) Hydrogen
- (b) Electrical storage
- (c) Natural gas
- (d) Petroleum

Ans: (a)

1131. When a lead acid cell is recharged:

- (a) The anode becomes dark chocolate brown colour
- (b) Voltage rises
- (c) Energy is absorbed by the cell
- (d) All of these

Ans: (d)

1132. A 6V battery is connected to 300Ω load. Under these conditions, it is rated at 40 Ah. How long can it supply current to the load?

- (a) 1000 h
- (b) 2000 h
- (c) 200 h
- (d) 4000 h

Ans: (b)

1133. Petroleum jelly is applied to the terminals of the lead acid battery in order to prevent.

- (a) Corrosion
- (b) Local heating
- (c) Short-circuiting
- (d) All of these

Ans: (a)

1134. Trickle charging of storage battery helps to

- (a) Prevent sulphation
- (b) Keep it fresh and fully charged
- (c) Maintain proper electrolyte level
- (d) Increase its reverse capacity

Ans: (b)

1135. The term ampere-hour (Ah) is associated with

- (a) Rectifiers
- (b) Transformers
- (c) Electromagnets
- (d) Storage cells

Ans: (d)

1136. Cells are connected in series in order increase the

- (a) Current capacity
- (b) Life of the cells
- (c) Voltage rating
- (d) Terminal voltage

Ans: c

1137. The emf of a cell depends upon

- (a) The internal resistance
- (b) External resistance
- (c) Electrolyte and electrodes of the cell
- (d) None of the factors

Ans: (a)

1138. What is the name of the instrument used to measure the specific density of a battery electrolyte

- (a) Pyrometer
- (b) Hydrometer
- (c) Lactometer
- (d) Fuel gauge

Ans: (b)

1139. Which of the following primary cell has the lowest voltage?

- (a) Lithium
- (b) Zinc-chloride
- (c) Mercury

(d) Carbon-zinc

Ans: (c)

1140. The active materials of a nickel-iron battery are

- (a) Nickel hydroxide
- (b) 21 % solution of KOH
- (c) Powdered iron and its oxide
- (d) All of the above

Ans: (d)

1141. During discharging of lead acid cells, the terminal voltage decrease with the decrease in

- (a) Temperature
- (b) Discharge rate
- (c) State of charge
- (d) None of these

Ans: (b)

1142. The process of coating of a metallic surface with a harder metal by electro-deposition is known as:

- (a) Electrofacing
- (b) Electro ionisation
- (c) Electrometallisation
- (d) Electroforming

Ans: (a)

1143. The function of the reference electrode in a pH meter is so

- (a) Produce a constant voltage
- (b) Provide temperature compensation
- (c) Provide a constant current
- (d) Measure average pH value

Ans: (a)

1144. How can we measure the battery capacity in SI units?

- (a) Wh
- (b) Ah
- (c) kWh
- (d) Vh

Ans: (b)

1145. Discharging of a battery

- (a) Reduces specific gravity of the electrolyte
- (b) Increases specific gravity of the electrolyte
- (c) Produces excessive gassing
- (d) Increases the temperature

Ans: (a)

1146. When cells are arranged in parallel:

- (a) Current capacity increases
- (b) Current capacity decreases

- (c) The e.m.f. increases
- (d) The e.m.f. decreases

Ans: (a)

1147. A battery has a short circuit current 30 A and open circuit voltage of 24 V. If the battery is connected to an electric bulb of resistance 2Ω , the power dissipated by the bulb is:

- (a) 80 W
- (b) 1800 W
- (c) 112.5 W
- (d) 147 W

Ans: (d)

POWER SYSTEM

1148. The insulating material for a cable should have

- A. low cost
- B. high dielectric strength
- C. high mechanical strength
- D. all of the above

Answer: D

1149. Which of the following protects a cable against mechanical injury ?

- A. Bedding
- B. Sheath
- C. Armouring
- D. None of the above

Answer: C

1150. Which of the following insulation is used in cables ?

- A. Varnished cambric
- B. Rubber
- C. Paper
- D. All of the above

Answer: D

1151. Empire tape is

- A. varnished cambric
- B. vulcanised rubber
- C. impregnated paper
- D. none of the above

Answer: A

1152. The thickness of the layer of insulation on the conductor, in cables, depends upon

- A. reactive power
- B. power factor
- C. voltage
- D. current carrying capacity

Answer: C

1153. The bedding on a cable consists of

- A. hessian cloth
- B. jute
- C. All of the above
- D. none of the above

Answer: C

1154. The insulating material for cables should

- A. be acid proof
- B. be non-inflammable
- C. be non-hygroscopic
- D. have all above properties

Answer: D

1155. In a cable immediately above metallic sheath _____ is provided.

- A. earthing connection
- B. bedding
- C. armouring
- D. none of the above

Answer: B

1156. The current carrying capacity of cables in D.C. is more than that in A.C. mainly due to

- A. absence of harmonics
- B. non-existence of any stability limit
- C. smaller dielectric loss
- D. absence of ripples

Answer: C

1157. In case of three core flexible cable the colour of the neutral is

- A. blue
- B. black
- C. brown
- D. none of the above

Answer: A

1158. cables are used for 132 kV lines.

- A. High tension
- B. Super tension
- C. Extra high tension
- D. Extra super voltage

Answer: D

1159. Conduit pipes are normally used to protect _____ cables.

- A. unsheathed cables
- B. armoured
- C. PVC sheathed cables
- D. all of the above

Answer: A

1160. The minimum dielectric stress in a cable is at

- A. armour
- B. bedding
- C. conductor surface
- D. lead sheath

Answer: D

1161. In single core cables armouring is not done to

- A. avoid excessive sheath losses
- B. make it flexible
- C. either of the above
- D. none of the above

Answer: A

1162. Dielectric strength of rubber is around

- A. 5 kV/mm
- B. 15 kV/mm
- C. 30 kV/mm
- D. 200 kV/mm

Answer: C

1163. Low tension cables are generally used up to

- A. 200 V
- B. 500 V
- C. 700 V
- D. 1000 V

Answer: D

1164. In a cable, the maximum stress under operating conditions is at

- A. insulation layer
- B. sheath
- C. armour
- D. conductor surface

Answer: D

1165. High tension cables are generally used up to

- A. 11kV
- B. 33kV
- C. 66 kV
- D. 132 kV

Answer: A

1166. The surge resistance of cable is

- A. 5 ohms
- B. 20 ohms
- C. 50 ohms
- D. 100 ohms

Answer: C

1167. PVC stands for

- A. polyvinyl chloride
- B. post varnish conductor
- C. pressed and varnished cloth
- D. positive voltage conductor

Answer: A

1168. In the cables, the location of fault is usually found out by comparing

- A. the resistance of the conductor
- B. the inductance of conductors
- C. the capacitances of insulated conductors
- D. all above parameters

Answer: C

1169. In capacitance grading of cables we use a _____ dielectric.

- A. composite
- B. porous
- C. homogeneous
- D. hygroscopic

Answer: A

1170. Pressure cables are generally not used beyond

- A. 11 kV
- B. 33 kV
- C. 66 kV
- D. 132 kV

Answer: C

1171. The material for armouring on cable is usually

- A. steel tape
- B. galvanised steel wire
- C. any of the above
- D. none of the above

Answer: C

1172. Cables, generally used beyond 66 kV are

- A. oil filled
- B. S.L. type
- C. belted
- D. armoured

Answer: A

1173. The relative permittivity of rubber is

- A. between 2 and 3
- B. between 5 and 6
- C. between 8 and 10
- D. between 12 and 14

Answer: A

1174. Solid type cables are considered unreliable beyond 66 kV because

- A. insulation may melt due to higher temperature
- B. skin effect dominates on the conductor
- C. of corona loss between conductor and sheath material
- D. there is a danger of breakdown of insulation due to the presence of voids

Answer: D

1175. If the length of a cable is doubled, its capacitance

- A. becomes one-fourth
- B. becomes one-half
- C. becomes double
- D. remains unchanged

Answer: C

1176. In cables the charging current

- A. lags the voltage by 90°
- B. leads the voltage by 90°
- C. lags the voltage by 180°
- D. leads the voltage by 180°

Answer: B

1177. A certain cable has an insulation of relative permittivity 4. If the insulation is replaced by one of relative permittivity 2, the capacitance of the cable will become

- A. one half
- B. double
- C. four times
- D. none of the above

Answer: A

1178. If a cable of homogeneous insulation has a maximum stress of 10 kV/mm, then the dielectric strength of insulation should be

- A. 5 kV/mm
- B. 10 kV/mm
- A. 15 kV/mm
- D. 30 kV/mm

Answer: B

1179. In the cables, sheaths are used to

- A. prevent the moisture from entering the cable
- B. provide enough strength
- C. provide proper insulation
- D. none of the above

Answer: A

1180. The inter sheaths in the cables are used to

- A. minimize the stress
- B. avoid the requirement of good insulation
- C. provide proper stress distribution
- D. none of the above

Answer: C

1181. The electrostatic stress in underground cables is

- A. same at the conductor and the sheath
- B. minimum at the conductor and maximum at the sheath
- C. maximum at the conductor and minimum at the sheath
- D. zero at the conductor as well as on the sheath

Answer: C

1182. The breakdown of insulation of the cable can be avoided economically by the use of

- A. inter-sheaths
- B. insulating materials with different dielectric constants
- C. both A. and B.
- D. none of the above

Answer: C

1183. The insulation of the cable decreases with

- A. the increase in length of the insulation
- B. the decrease in the length of the insulation
- C. either A. or B.
- D. none of the above

Answer: A

1184. A cable carrying alternating current has

- A. hysteresis losses only
- B. hysteresis and leakage losses only
- C. hysteresis, leakage and copper losses only
- D. hysteresis, leakage, copper and friction losses

Answer: B

1185. In a cable the voltage stress is maximum at

- A. sheath
- B. insulator
- C. surface of the conductor
- D. core of the conductor

Answer: D

1186. Capacitance grading of cable implies

- A. use of dielectrics of different permeabilities
- B. grading according to capacitance of cables per km length
- C. cables using single dielectric in different concentrations
- D. capacitance required to be introduced at different lengths to counter the effect of inductance

Answer: A

1187. Underground cables are laid at sufficient depth

- A. to minimise temperature stresses
- B. to avoid being unearthed easily due to removal of soil
- C. to minimise the effect of shocks and vibrations due to passing vehicles, etc.
- D. for all of the above reasons

Answer: C

1188. The advantage of cables over overhead transmission lines is

- A. easy maintenance
- B. low cost
- C. can be used in congested areas
- D. can be used in high voltage circuits

Answer: C

1189. The thickness of metallic shielding on cables is usually

- A. 0.04 mm
- B. 0.2 to 0.4 mm
- C. 3 to 5 mm
- D. 40 to 60 mm

Answer: A

1190. Cables for 220 kV lines are invariably

- A. mica insulated
- B. paper insulated
- C. compressed oil or compressed gas insulated
- D. rubber insulated

Answer: C

1191. Is a cable is to be designed for use on 1000 kV, which insulation would you prefer ?

- A. Polyvinyle chloride
- B. Vulcanised rubber
- C. Impregnated paper
- D. Compressed SFe gas

Answer: D

1192. If a power cable and a communication cable are to run parallel the minimum distance between the two, to avoid interference, should be

- A. 2 cm
- B. 10 cm
- C. 50 cm
- D. 400 cm

Answer: C

1193. Copper as conductor for cables is used as

- A. annealed
- B. hardened and tempered
- C. hard drawn
- D. alloy with chromium

Answer: A

1194. The insulating material should have

- A. low permittivity
- B. high resistivity
- C. high dielectric strength
- D. all of the above

Answer: D

1195. The advantage of oil filled cables is

- A. more perfect impregnation
- B. smaller overall size
- C. no ionisation, oxidation and formation of voids
- D. all of the above

Answer: D

1196. The disadvantage with paper as insulating material is

- A. it is hygroscopic
- B. it has high capacitance
- C. it is an organic material
- D. none of the above

Answer: A

1197. The breakdown voltage of a cable depends on

- A. presence of moisture
- B. working temperature
- C. time of application of the voltage
- D. all of the above

Answer: D

1198. Which of the following does not change in a transformer ?

- (a) Current
- (b) Voltage
- (c) Frequency
- (d) All of the above

Answer: c

1199. In a transformer the energy is conveyed from primary to secondary

- (a) through cooling coil
- (b) through air
- (c) by the flux
- (d) none of the above

Answer: c

1200. A transformer core is laminated to

- (a) reduce hysteresis loss
- (b) reduce eddy current losses
- (c) reduce copper losses
- (d) reduce all above losses

Answer: b

1201. The degree of mechanical vibrations produced by the laminations of a transformer depends on

- (a) tightness of clamping
- (b) gauge of laminations
- (c) size of laminations
- (d) all of the above

Answer: d

1202. The no-load current drawn by transformer is usually what per cent of the full-load current ?

- (a) 0.2 to 0.5 per cent
- (b) 2 to 5 per cent
- (c) 12 to 15 per cent
- (d) 20 to 30 per cent

Answer: b

1203. The path of a magnetic flux in a transformer should have

- (a) high resistance
- (b) high reluctance
- (c) low resistance
- (d) low reluctance

Answer: d

1204. No-load on a transformer is carried out to determine

- (a) copper loss
- (b) magnetising current
- (c) magnetising current and loss
- (d) efficiency of the transformer

Answer: c

1205. The dielectric strength of transformer oil is expected to be

- (a) 1kV
- (b) 33 kV
- (c) 100 kV
- (d) 330 kV

Answer: b

1206. Sumpner's test is conducted on trans-formers to determine

- (a) temperature
- (b) stray losses
- (c) all-day efficiency
- (d) none of the above

Answer: a

1207. The permissible flux density in case of cold rolled grain oriented steel is around

- (a) 1.7 Wb/m²
- (b) 2.7 Wb/m²
- (c) 3.7 Wb/m²
- (d) 4.7 Wb/m²

Answer: a

1208. The efficiency of a transformer will be maximum when

- (a) copper losses = hysteresis losses
- (b) hysteresis losses = eddy current losses
- (c) eddy current losses = copper losses
- (d) copper losses = iron losses

Answer: d

1209. No-load current in a transformer

- (a) lags behind the voltage by about 75°
- (b) leads the voltage by about 75°
- (c) lags behind the voltage by about 15°
- (d) leads the voltage by about 15°

Answer: a

1210. The purpose of providing an iron core in a transformer is to

- (a) provide support to windings
- (b) reduce hysteresis loss
- (c) decrease the reluctance of the magnetic path
- (d) reduce eddy current losses

Answer: c

1211. Which of the following is not a part of transformer installation ?

- (a) Conservator
- (b) Breather
- (c) Buchholz relay
- (d) Exciter

Answer: d

1212. While conducting short-circuit test on a transformer the following side is short circuited

- (a) High voltage side
- (b) Low voltage side
- (c) Primary side
- (d) Secondary side

Answer: b

1213. In the transformer following winding has got more cross-sectional area

- (a) Low voltage winding
- (b) High voltage winding
- (c) Primary winding
- (d) Secondary winding

Answer: a

1214. A transformer transforms

- (a) voltage
- (b) current
- (c) power
- (d) frequency

Answer: c

1215. A transformer cannot raise or lower the voltage of a D.C. supply because

- (a) there is no need to change the D.C. voltage
- (b) a D.C. circuit has more losses
- (c) Faraday's laws of electromagnetic induction are not valid since the rate of change of flux is zero

(d) none of the above

Answer: c

1216. Primary winding of a transformer

- (a) is always a low voltage winding
- (b) is always a high voltage winding
- (c) could either be a low voltage or high voltage winding
- (d) none of the above

Answer: c

1217. 20. Which winding in a transformer has more number of turns ?

- (a) Low voltage winding
- (b) High voltage winding
- (c) Primary winding
- (d) Secondary winding

Answer: b

1218. Efficiency of a power transformer is of the order of

- (a) 100 per cent
- (b) 98 per cent
- (c) 50 per cent
- (d) 25 per cent

Answer: b

1219. In a given transformer for given applied voltage, losses which remain constant irrespective of load changes are

- (a) friction and windage losses
- (b) copper losses
- (c) hysteresis and eddy current losses
- (d) none of the above

Answer: c

1220. A common method of cooling a power transformer is

- (a) natural air cooling
- (b) air blast cooling
- (c) oil cooling
- (d) any of the above

Answer: c

1221. The no load current in a transformer lags behind the applied voltage by an angle of about

- (a) 180°
- (b) 120°
- (c) 90°
- (d) 75°

Answer: d

1222. In a transformer routine efficiency depends upon

- (a) supply frequency
- (b) load current

- (c) power factor of load
- (d) both (b) and (c)

Answer: d

1223. In the transformer the function of a conservator is to

- (a) provide fresh air for cooling the transformer
- (b) supply cooling oil to transformer in time of need
- (c) protect the transformer from damage when oil expands due to heating
- (d) none of the above

Answer: c

1224. Natural oil cooling is used for transformers up to a rating of

- (a) 3000 kVA
- (b) 1000 kVA
- (c) 500 kVA
- (d) 250 kVA

Answer: a

1225. Power transformers are designed to have maximum efficiency at

- (a) nearly full load
- (b) 70% full load
- (c) 50% full load
- (d) no load

Answer: a

1226. The maximum efficiency of a distribution transformer is

- (a) at no load
- (b) at 50% full load
- (c) at 80% full load
- (d) at full load

Answer: b

1227. Transformer breaths in when

- (a) load on it increases
- (b) load on it decreases
- (c) load remains constant
- (d) none of the above

Answer: b

1228. No-load current of a transformer has

- (a) has high magnitude and low power factor
- (b) has high magnitude and high power factor
- (c) has small magnitude and high power factor
- (d) has small magnitude and low power factor

Answer: d

1229. Spacers are provided between adjacent coils

- (a) to provide free passage to the cooling oil
- (b) to insulate the coils from each other
- (c) both (a) and (b)

(d) none of the above

Answer: a

1230. Greater the secondary leakage flux

- (a) less will be the secondary induced e.m.f.
- (b) less will be the primary induced e.m.f.
- (c) less will be the primary terminal voltage
- (d) none of the above

Answer: a

1231. The purpose of providing iron core in a step-up transformer is

- (a) to provide coupling between primary and secondary
- (b) to increase the magnitude of mutual flux
- (c) to decrease the magnitude of magnetizing current
- (d) to provide all above features

Answer: c

1232. The power transformer is a constant

- (a) voltage device
- (b) current device
- (c) power device
- (d) main flux device

Answer: d

1233. Two transformers operating in parallel will share the load depending upon their

- (a) leakage reactance
- (b) per unit impedance
- (c) efficiencies
- (d) ratings

Answer: b

1234. If R_2 is the resistance of secondary winding of the transformer and K is the transformation ratio then the equivalent secondary resistance referred to primary will be

- (a) R_2/VK
- (b) R_2/K^2
- (c) R_2/K
- (d) R_2/K

Answer: b

1235. What will happen if the transformers working in parallel are not connected with regard to polarity ?

- (a) The power factor of the two transformers will be different from the power factor of common load
- (b) Incorrect polarity will result in dead short circuit
- (c) The transformers will not share load in proportion to their kVA ratings
- (d) none of the above

Answer: b

1236. If the percentage impedances of the two transformers working in parallel are different, then

- (a) transformers will be overheated
- (b) power factors of both the transformers will be same
- (c) parallel operation will be not possible
- (d) parallel operation will still be possible, but the power factors at which the two transformers operate will be different from the power factor of the common load

Answer: d

1237. In a transformer the tapplings are generally provided on

- (a) primary side
- (b) secondary side
- (c) low voltage side
- (d) high voltage side

Answer: c

1238. The use of higher flux density in the transformer design

- (a) reduces weight per kVA
- (b) reduces iron losses
- (c) reduces copper losses
- (d) increases part load efficiency

Answer: a

1239. The chemical used in breather for transformer should have the quality of

- (a) ionizing air
- (b) absorbing moisture
- (c) cleansing the transformer oil
- (d) cooling the transformer oil.

Answer: b

1240. The chemical used in breather is

- (a) asbestos fiber
- (b) silica sand
- (c) sodium chloride
- (d) silica gel

Answer: d

1241. An ideal transformer has infinite values of primary and secondary inductances. The statement is

- (a) true
- (b) false

Answer: b

1242. The transformer ratings are usually expressed in terms of

- (a) volts
- (b) amperes
- (c) kW

(d) kVA

Answer: d

1243. The noise resulting from vibrations of laminations set by magnetic forces, is termed as

- (a) magnetostriction
- (b) boo
- (c) hum
- (d) zoom

Answer: c

1244. Hysteresis loss in a transformer varies as B_{max} = maximum flux density)

- (a) B_{max}
- (b) B_{max}^{1-6}
- (c) B_{max}^{1-83}
- (d) B_{max}

Answer: b

1245. Material used for construction of transformer core is usually

- (a) wood
- (b) copper
- (c) aluminium
- (d) silicon steel

Answer: d

1246. The thickness of laminations used in a transformer is usually

- (a) 0.4 mm to 0.5 mm
- (b) 4 mm to 5 mm
- (c) 14 mm to 15 mm
- (d) 25 mm to 40 mm

Answer: a

1247. The function of conservator in a transformer is

- (a) to protect against internal fault
- (b) to reduce copper as well as core losses
- (c) to cool the transformer oil
- (d) to take care of the expansion and contraction of transformer oil due to variation of temperature of surroundings

Answer: d

1248. The highest voltage for transmitting electrical power in India is

- (a) 33 kV.
- (b) 66 kV
- (c) 132 kV
- (d) 400 kV

Answer: d

1249. In a transformer the resistance between its primary and secondary is

- (a) zero
- (b) 1 ohm

- (c) 1000 ohms
- (d) infinite

Answer: d

1250. A transformer oil must be free from

- (a) sludge
- (b) odour
- (c) gases
- (d) moisture

Answer: d

1251. A Buchholz relay can be installed on

- (a) auto-transformers
- (b) air-cooled transformers
- (c) welding transformers
- (d) oil cooled transformers

Answer: d

1252. Gas is usually not liberated due to dissociation of transformer oil unless the oil temperature exceeds

- (a) 50°C
- (b) 80°C
- (c) 100°C
- (d) 150°C

Answer: d

1253. The main reason for generation of harmonics in a transformer could be

- (a) fluctuating load
- (b) poor insulation
- (c) mechanical vibrations
- (d) saturation of core

Answer: d

1254. Distribution transformers are generally designed for maximum efficiency around

- (a) 90% load
- (b) zero load
- (c) 25% load
- (d) 50% load

Answer: d

1255. Which of the following property is not necessarily desirable in the material for transformer core ?

- (a) Mechanical strength
- (b) Low hysteresis loss
- (c) High thermal conductivity
- (d) High permeability

Answer: c

1256. Star/star transformers work satisfactorily when

- (a) load is unbalanced only

- (b) load is balanced only
- (c) on balanced as well as unbalanced loads
- (d) none of the above

Answer: b

1257. Delta/star transformer works satisfactorily when

- (a) load is balanced only
- (b) load is unbalanced only
- (c) on balanced as well as unbalanced loads
- (d) none of the above

Answer: c

1258. Buchholz's relay gives warning and protection against

- (a) electrical fault inside the transformer itself
- (b) electrical fault outside the transformer in outgoing feeder
- (c) for both outside and inside faults
- (d) none of the above

Answer: a

1259. The magnetising current of a transformer is usually small because it has

- (a) small air gap
- (b) large leakage flux
- (c) laminated silicon steel core
- (d) fewer rotating parts

Answer: a

1260. Which of the following does not change in an ordinary transformer ?

- (a) Frequency
- (b) Voltage
- (c) Current
- (d) Any of the above

Answer: a

1261. Which of the following properties is not necessarily desirable for the material for transformer core ?

- (a) Low hysteresis loss
- (b) High permeability
- (c) High thermal conductivity
- (d) Adequate mechanical strength

Answer: c

1262. The leakage flux in a transformer depends upon

- (a) load current
- (b) load current and voltage
- (c) load current, voltage and frequency
- (d) load current, voltage, frequency and power factor

Answer: a

1263. The path of the magnetic flux in transformer should have

- (a) high reluctance

- (b) low reactance
- (c) high resistance
- (d) low resistance

Answer: b

1264. Noise level test in a transformer is a

- (a) special test
- (b) routine test
- (c) type test
- (d) none of the above

Answer: c

1265. Which of the following is not a routine test on transformers ?

- (a) Core insulation voltage test
- (b) Impedance test
- (c) Radio interference test
- (d) Polarity test

Answer: c

1266. A transformer can have zero voltage regulation at

- (a) leading power factor
- (b) lagging power factor
- (c) unity power factor
- (d) zero power factor

Answer: a

1267. Helical coils can be used on

- (a) low voltage side of high kVA transformers
- (b) high frequency transformers
- (c) high voltage side of small capacity transformers
- (d) high voltage side of high kVA rating transformers

Answer: a

1268. Harmonics in transformer result in

- (a) increased core losses
- (b) increased I^2R losses
- (c) magnetic interference with communication circuits
- (d) all of the above

Answer: d

1269. The core used in high frequency transformer is usually

- (a) copper core
- (b) cast iron core
- (c) air core
- (d) mild steel core

Answer: c

1270. The full-load copper loss of a transformer is 1600 W. At half-load, the copper loss will be

- (a) 6400 W

- (b) 1600 W
- (c) 800 W
- (d) 400 W

Answer: d

1271. The value of flux involved in the e.m.f. equation of a transformer is

- (a) average value
- (b) r.m.s. value
- (c) maximum value
- (d) instantaneous value

Answer: c

1272. Silicon steel used in laminations mainly reduces

- (a) hysteresis loss
- (b) eddy current losses
- (c) copper losses
- (d) all of the above

Answer: a

1273. Which winding of the transformer has less cross-sectional area ?

- (a) Primary winding
- (b) Secondary winding
- (c) Low voltage winding
- (d) High voltage winding

Answer: d

1274. Power transformers are generally designed to have maximum efficiency around

- (a) no-load
- (b) half-load
- (c) near full-load
- (d) 10% overload

Answer: c

1275. Which of the following is the main advantage of an auto-transformer over a two winding transformer ?

- (a) Hysteresis losses are reduced
- (b) Saving in winding material
- (c) Copper losses are negligible
- (d) Eddy losses are totally eliminated

Answer: b

1276. During short circuit test iron losses are negligible because

- (a) the current on secondary side is negligible
- (b) the voltage on secondary side does not vary
- (c) the voltage applied on primary side is low
- (d) full-load current is not supplied to the transformer

Answer: c

1277. Two transformers are connected in parallel. These transformers do not have equal percentage impedance. This is likely to result in

- (a) short-circuiting of the secondaries
- (b) power factor of one of the transformers is leading while that of the other lagging
- (c) transformers having higher copper losses will have negligible core losses
- (d) loading of the transformers not in proportion to their kVA ratings

Answer: d

1278. The changes in volume of transformer cooling oil due to variation of atmospheric temperature during day and

night is taken care of by which part of transformer

- (a) Conservator
- (b) Breather
- (c) Bushings
- (d) Buchholz relay

Answer: a

1279. An ideal transformer is one which has

- (a) no losses and magnetic leakage
- (b) interleaved primary and secondary windings
- (c) a common core for its primary and secondary windings
- (d) core of stainless steel and winding of pure copper metal

Answer: a

1280. When a given transformer is run at its rated voltage but reduced frequency, its

- (a) flux density remains unaffected
- (b) iron losses are reduced
- (c) core flux density is reduced
- (d) core flux density is increased

Answer: d

1281. In an actual transformer the iron loss remains practically constant from no load to full load because

- (a) value of transformation ratio remains constant
- (b) permeability of transformer core remains constant
- (c) core flux remains practically constant
- (d) primary voltage remains constant

Answer: c

1282. An ideal transformer will have maximum efficiency at a load such that

- (a) copper loss = iron loss
- (b) copper loss < iron loss
- (c) copper loss > iron loss
- (d) none of the above

Answer: a

1283. If the supply frequency to the transformer is increased, the iron loss will

- (a) not change
- (b) decrease

- (c) increase
- (d) any of the above

Answer: c

1284. Negative voltage regulation is indicative that the load is

- (a) capacitive only
- (b) inductive only
- (c) inductive or resistive
- (d) none of the above

Answer: a

1285. Iron loss of a transformer can be measured by

- (a) low power factor wattmeter
- (b) unity power factor wattmeter
- (c) frequency meter
- (d) any type of wattmeter

Answer: a

1286. When secondary of a current transformer is open-circuited its iron core will be

- (a) hot because of heavy iron losses taking place in it due to high flux density
- (b) hot because primary will carry heavy current
- (c) cool as there is no secondary current
- (d) none of above will happen

Answer: a

1287. The transformer laminations are insulated from each other by

- (a) mica strip
- (b) thin coat of varnish
- (c) paper
- (d) any of the above

Answer: b

1288. Which type of winding is used in 3phase shell-type transformer ?

- (a) Circular type
- (b) Sandwich type
- (c) Cylindrical type
- (d) Rectangular type

Answer: b

1289. During open circuit test of a transformer

- (a) primary is supplied rated voltage
- (b) primary is supplied full-load current
- (c) primary is supplied current at reduced voltage
- (d) primary is supplied rated kVA

Answer: a

1290. Open circuit test on transformers is conducted to determine

- (a) hysteresis losses
- (b) copper losses
- (c) core losses

(d) eddy current losses

Answer: c

1291. Short circuit test on transformers is conducted to determine

- (a) hysteresis losses
- (b) copper losses
- (c) core losses
- (d) eddy current losses

Answer: b

1292. For the parallel operation of single phase transformers it is necessary that they should have

- (a) same efficiency
- (b) same polarity
- (c) same kVA rating
- (d) same number of turns on the secondary side.

Answer: b

1293. The transformer oil should have _____ volatility and _____ viscosity.

- (a) low, low
- (b) high, high
- (c) low, high
- (d) high, low

Answer: a

1294. The function of breather in a transformer is

- (a) to provide oxygen inside the tank
- (b) to cool the coils during reduced load
- (c) to cool the transformer oil
- (d) to arrest flow of moisture when outside air enters the transformer

Answer: d

1295. The secondary winding of which of the following transformers is always kept closed ?

- (a) Step-up transformer
- (b) Step-down transformer
- (c) Potential transformer
- (d) Current transformer

Answer: d

1296. The size of a transformer core will depend on

- (a) frequency
- (b) area of the core
- (c) flux density of the core material
- (d) (a) and (b) both

Answer: d

1297. Natural air cooling is generally restricted for transformers up to

- (a) 1.5 MVA

- (b) 5 MVA
- (c) 15 MVA
- (d) 50 MVA

Answer: a

1298. A shell-type transformer has

- (a) high eddy current losses
- (b) reduced magnetic leakage
- (c) negligibly hysteresis losses
- (d) none of the above

Answer: b

1299. A transformer can have regulation closer to zero

- (a) on full-load
- (b) on overload
- (c) on leading power factor
- (d) on zero power factor

Answer: c

1300. A transformer transforms

- (a) voltage
- (b) current
- (c) current and voltage
- (d) power

Answer: d

1301. Which of the following is not the standard voltage for power supply in India ?

- (a) 11kV
- (b) 33kV
- (c) 66 kV
- (d) 122 kV

Answer: d

1302. Reduction in core losses and increase in permeability are obtained with transformer employing

- (a) core built-up of laminations of cold rolled grain oriented steel
- (b) core built-up of laminations of hot rolled sheet
- (c) either of the above
- (d) none of the above

Answer: a

1303. In a power or distribution transformer about 10 per cent end turns are heavily insulated

- (a) to withstand the high voltage drop due to line surge produced by the shunting capacitance of the end turns
- (b) to absorb the line surge voltage and save the winding of transformer from damage
- (c) to reflect the line surge and save the winding of a transformer from damage
- (d) none of the above

Answer: a

1304. For given applied voltage, with the increase in frequency of the applied voltage

- (a) eddy current loss will decrease
- (b) eddy current loss will increase
- (c) eddy current loss will remain unchanged
- (d) none of the above

Answer: c

1305. Losses which occur in rotating electric machines and do not occur in transformers are

- (a) friction and windage losses
- (b) magnetic losses
- (c) hysteresis and eddy current losses
- (d) copper losses

Answer: a

1306. In a given transformer for a given applied voltage, losses which remain constant irrespective of load changes are

- (a) hysteresis and eddy current losses
- (b) friction and windage losses
- (c) copper losses
- (d) none of the above

Answer: a

1307. Which of the following statements regarding an ideal single-phase transformer having a turn ratio of 1 : 2 and drawing a current of 10 A from 200 V A.C. supply is incorrect ?

- (a) Its secondary current is 5 A
- (b) Its secondary voltage is 400 V
- (c) Its rating is 2 kVA
- (d) Its secondary current is 20 A
- (e) It is a step-up transformer

Answer: d

1308. The secondary of a current transformer is always short-circuited under operating conditions because it

- (a) avoids core saturation and high voltage induction
- (b) is safe to human beings
- (c) protects the primary circuit
- (d) none of the above

Answer: a

1309. In a transformer the resistance between its primary and secondary should be

- (a) zero
- (b) 10 Ω
- (c) 1000 Ω
- (d) infinity

Answer: d

1310. A good voltage regulation of a transformer means

- (a) output voltage fluctuation from no load to full load is least

- (b) output voltage fluctuation with power factor is least
- (c) difference between primary and secondary voltage is least
- (d) difference between primary and secondary voltage is maximum

Answer: a

1311. For a transformer, operating at constant load current, maximum efficiency will occur at

- (a) 0.8 leading power factor
- (b) 0.8 lagging power factor
- (c) zero power factor
- (d) unity power factor

Answer: d

1312. Which of the following protection is normally not provided on small distribution transformers ?

- (a) Overfluxing protection
- (b) Buchholz relay
- (c) Overcurrent protection
- (d) All of the above

Answer: b

1313. Which of the following acts as a protection against high voltage surges due to lightning and switching ?

- (a) Horn gaps
- (b) Thermal overload relays
- (c) Breather
- (d) Conservator

Answer: a

1314. The efficiency of two identical transformers under load conditions can be determined by

- (a) short-circuit test
- (b) back-to-back test
- (c) open circuit test
- (d) any of the above

Answer: b

1315. Which of the following insulating materials can withstand the highest temperature safely ?

- (a) Cellulose
- (b) Asbestos
- (c) Mica
- (d) Glass fibre

Answer: c

1316. Which of the following parts of a transformer is visible from outside ?

- (a) Bushings
- (b) Core
- (c) Primary winding
- (d) Secondary winding

Answer: a

1317. The noise produced by a transformer is termed as

- (a) zoom
- (b) hum
- (c) ringing
- (d) buzz

Answer: b

1318. Which of the following loss in a transformer is zero even at full load ?

- (a) Core loss
- (b) Friction loss
- (c) Eddy current loss
- (d) Hysteresis loss

Answer: b

1319. Which of the following is the most likely source of harmonics in a transformer ?

- (a) poor insulation
- (b) Overload
- (c) loose connections
- (d) Core saturation

Answer: d

1320. If a transformer is continuously operated the maximum temperature rise will occur in

- (a) core
- (b) windings
- (c) tank
- (d) any of the above

Answer: b

1321. The hum in a transformer is mainly attributed to

- (a) load changes
- (b) oil in the transformer
- (c) magnetostriction
- (d) mechanical vibrations

Answer: c

1322. The maximum load that a power transformer can carry is limited by its

- (a) temperature rise
- (b) dielectric strength of oil
- (c) voltage ratio
- (d) copper loss

Answer: c

1323. The efficiency of a transformer, under heavy loads, is comparatively low because

- (a) copper loss becomes high in proportion to the output
- (b) iron loss is increased considerably
- (c) voltage drop both in primary and secondary becomes large
- (d) secondary output is much less as compared to primary input

Answer: a

1324. An open-circuit test on a transformer is conducted primarily to measure

- (a) insulation resistance
- (b) copper loss
- (c) core loss
- (d) total loss
- (e) efficiency
- (f) none of the above

Answer: c

1325. A no-load test is performed on a transformer to determine

- (a) core loss
- (b) copper loss
- (c) efficiency
- (d) magnetising current
- (e) magnetising current and loss

Ans: e

1326. The voltage transformation ratio of a transformer is equal to the ratio of

- (a) primary turns to secondary turns
- (b) secondary current to primary current
- (c) secondary induced e.m.f. to primary induced e.m.f.
- (d) secondary terminal voltage to primary applied voltage

Answer: c

1327. Part of the transformer which is most subject to damage from overheating is

- (a) iron core
- (b) copper winding
- (c) winding insulation
- (d) frame or case
- (e) transformer tank

Answer: c

1328. If a transformer is switched on to a voltage more than the rated voltage

- (a) its power factor will deteriorate
- (b) its power factor will increase
- (c) its power factor will remain unaffected
- (d) its power factor will be zero

Answer: a

1329. Auto-transformer makes effective saving on copper and copper losses, when its transformation ratio is

- (a) approximately equal to one
- (b) less than one
- (c) great than one
- (d) none of the above

Answer: a

1330. Minimum voltage regulation occurs when the power factor of the load is

- (a) unity
- (b) lagging
- (c) leading
- (d) zero

Answer: c

1331. In a step-down transformer, there is a change of 15 A in the load current. This results in change of supply current of

- (a) less than 15 A
- (b) more than 15 A
- (c) 15 A
- (d) none of the above

Answer: a

1332. The efficiencies of transformers compared with that of electric motors of the same power are

- (a) about the same
- (b) much smaller
- (c) much higher
- (d) somewhat smaller
- (e) none of the above

Answer: c

1333. The main function of a fuse is to

- (a) protect the line
- (b) open the circuit
- (c) protect the appliance
- (d) prevent excessive currents

Ans: d

1334. On which of the following routine tests are conducted ?

- (a) Oil circuit breakers
- (b) Air blast circuit breakers
- (c) Minimum oil circuit breakers
- (d) All of the above

Ans: d

1335. SF₆ gas

- (a) is yellow in colour
- (b) is lighter than air
- (c) is nontoxic
- (d) has pungent smell

Ans: c

1336. The arcing contacts in a circuit breaker are made of

- (a) copper tungsten alloy
- (b) porcelain
- (c) electrolytic copper
- (d) aluminium alloy

Ans: a

1337. Which of the following mediums is employed for extinction of arc in air circuit breaker ?

- (a) Water
- (b) Oil
- (c) Air
- (d) SF6

Ans: c

1338. With which of the following, a circuit breaker must be equipped for remote operation ?

- (a) Inverse time trip
- (b) Time-delay trip
- (c) Shunt trip
- (d) None of the above

Ans: c

1339. Fault diverters are basically

- (a) fuses
- (b) relays
- (c) fast switches
- (d) circuit breakers

Ans: c

1340. A thermal protection switch can protect against

- (a) short-circuit
- (b) temperature
- (c) overload
- (d) over voltage

Ans: c

1341. Arc in a circuit behaves as

- (a) a capacitive reactance
- (b) an inductive reactance
- (c) a resistance increasing with voltage rise across the arc
- (d) a resistance decreasing with voltage rise across the arc

Ans: d

1342. Thermal circuit breaker has

- (a) delayed trip action
- (b) instantaneous trip action
- (c) both of the above
- (d) none of the above

Ans: a

1343. Relays can be designed to respond to changes in

- (a) resistance, reactance or impedance
- (b) voltage and current
- (c) temperature

(d) all above

Ans: d

1344. Overload relays are of..... type.

- (a) induction
- (b) thermal
- (c) electromagnetic
- (d) all above

Ans: d

1345. Thermal overload relays are used to protect the motor against over current due to

- (a) short-circuits
- (b) heavy loads
- (c) grounds
- (d) all of the above

Ans: b

1346. Magnetic circuit breaker has _____ trip action.

- (a) delayed
- (b) instantaneous
- (c) both of the above
- (d) none of the above

Ans: b

1347. D.C. shunt relays are made of

- (a) few turns of thin wire
- (b) few turns of thick wire
- (c) many turns of thin wire
- (d) many turns of thick wire

Ans: c

1348. The relay operating speed depends upon

- (a) the spring tension
- (b) the rate of flux built up
- (c) armature core air gap
- (d) all of the above

Ans: d

1349. In order that current should flow without causing excessive heating or voltage drop, the relay contacts should

- (a) have low contact resistance
- (b) be clean and smooth
- (c) be of sufficient size and proper shape
- (d) have all above properties

Ans: d

1350. Circuit breakers usually operate under

- (a) transient state of short-circuit current
- (b) sub-transient state of short-circuit current
- (c) steady state of short-circuit current

(d) after D.C. component has ceased

Ans: a

1351. Circuit breakers are essentially

- (a) current carrying contacts called electrodes
- (b) arc extinguishers
- (c) circuits to break the system
- (d) transformers to isolate the two systems

Ans: a

1352. The current zero interruption, in oil and air blast circuit breakers, is achieved by

- (a) lengthening of the gap
- (b) cooling and blast effect
- (c) both (a) and (b)
- (d) deionizing the oil with forced air

Ans: c

1353. Air blast circuit breaker is used for

- (a) over currents
- (b) short duty
- (c) intermittent duty
- (d) repeated duty

Ans: d

1354. An efficient and a well designed protective relaying should have

- (a) good selectivity and reliability
- (b) economy and simplicity
- (c) high speed and selectivity
- (d) all of the above

Ans: d

1355. Burden of a protective relay is the power

- (a) required to operate the circuit breaker
- (b) absorbed by the circuit of relay
- (c) developed by the relay circuit
- (d) none of the above

Ans: b

1356. Directional relays are based on flow of

- (a) power
- (b) current
- (c) voltage wave
- (d) all of the above

Ans:

1357. A differential relay measures the vector difference between

- (a) two currents
- (b) two voltages
- (c) two or more similar electrical quantities
- (d) none of the above

Ans: c

1358. A transmission line is protected by

- (a) inrush protection
- (b) distance protection
- (c) time graded and current graded over current protection
- (d) both (b) and (c)

Ans: d

1359. Large internal faults are protected by

- (a) merz price percentage differential protection
- (b) mho and ohm relays
- (c) horn gaps and temperature relays
- (d) earth fault and positive sequence relays

Ans: a

1360. When a transmission line is energized, the wave that propagates on it is

- (a) current wave only
- (b) voltage wave only
- (c) both (a) and (b)
- (d) power factor wave only

Ans: c

1361. Protective relays are devices that detect abnormal conditions in electrical circuits by measuring

- (a) current during abnormal condition
- (b) voltage during abnormal condition
- (c) constantly the electrical quantities which differ during normal and abnormal conditions
- (d) none of the above

Ans: c

1362. The voltage appearing across the contacts after opening of the circuit breaker is called _____ voltage.

- (a) recovery
- (b) surge
- (c) operating
- (d) arc

Ans: a

1363. Ionization in circuit breaker is facilitated by

- (a) high temperature
- (b) increase of mean free path
- (c) increasing field strength
- (d) all of the above

Ans: d

1364. In a circuit breaker the basic problem is to

- (a) maintain the arc

- (b) extinguish the arc
- (c) transmit large power
- (d) emit the ionizing electrons

Ans: c

1365. Overheating of relay contacts or contact born out is due to

- (a) slow making and breaking of load circuit contacts
- (b) foreign matter on the contact surface
- (c) too low contact pressure
- (d) all of the above

Ans: d

1366. Interruption of large currents by relay requires

- (a) arc suppressing blow out coils
- (b) wide separation of the opened contacts
- (c) high speed opening of contacts
- (d) all of the above

Ans: d

1367. Shunt capacitance is neglected while considering

- (a) short transmission line
- (b) medium transmission line
- (c) long transmission line
- (d) medium and long transmission lines

Ans: a

1368. The arc voltage produced in A.C. circuit breaker is always

- (a) in phase with the arc current
- (b) lagging the arc current by 90°
- (c) leading the arc current by 90°
- (d) none of the above

Ans: a

1369. The time of closing the cycle, in modern circuit breakers is

- (a) 0.003 sec
- (b) 0.001 sec
- (c) 0.01 sec
- (d) 0.10 sec

Ans: a

1370. Insulation resistance of high voltage circuit breakers is more than

- (a) 1 mega ohms
- (b) 10 mega ohms
- (c) 100 mega ohms
- (d) 500 mega ohms

Ans: c

1371. H.R.C. fuses provide best protection against

- (a) overload
- (b) reverse current

- (c) open-circuits
- (d) short-circuits

Ans: d

1372. The ground wire should not be smaller than No _____ copper.

- (a) 2
- (b) 4
- (c) 6
- (d) 10

Ans: d

1373. The delay fuses are used for the protection of _____ .

- (a) motors
- (b) power outlet circuits
- (c) fluorescent lamps
- (d) light circuits

Ans: a

1374. Which of the following is the least expensive protection for overcurrent is low voltage system ?

- (a) Rewireable fuse
- (b) Isolator
- (c) Oil circuit breaker
- (d) Air break circuit breaker

Ans: a

1375. Resistance grounding is used for voltage between

- (a) 33kV to 66kV
- (b) HkV to 33kV
- (c) 3.3kV and 11kV
- (d) none of the above

Ans: c

1376. The contacts of high voltage switches used in power system are submerged in oil. The main purpose of the oil is to

- (a) lubricate the contacts
- (b) insulate the contacts from switch body
- (c) extinguish the arc
- (d) all of the above

Ans: c

1377. To protect most of the electrical equipment handling low power, the types of relays used are

- (a) thermocouple
- (b) electronic and bimetallic
- (c) both (a) and (b)
- (d) none of the above

Ans: c

1378. Wave trap is used to trap waves of

- (a) power frequencies
- (b) higher frequencies entering generator or transformer units
- (c) either of the above
- (d) none of the above

Ans: b

1379. Ungrounded neutral transmission system is not recommended because of system

- (a) insulation being overstressed due to over voltages
- (b) insulation overstress may lead to failure and subsequent phase to phase faults
- (c) being inadequately protected against ground fault
- (d) all of the above

Ans: d

1380. The reflection is co-efficient at the open circuited end of a transmission line.

- (a) zero
- (b) infinity
- (c) unity
- (d) none of the above

Ans: c

1381. For the protection of power station buildings against direct strokes the requirements are

- (a) interception
- (b) interception and conduction
- (c) interception, conduction and dissipation
- (d) interception, conduction, dissipation and reflection

Ans: c

1382. The line insulation is the insulation level of the station equipment.

- (a) less than
- (b) more than
- (c) proportional to
- (d) not directly related with

Ans: d

1383. The interaction between a transmission line and communication line is minimized by

- (a) transposing transmission as well as communication lines
- (b) increasing the height of the transmission line tower
- (c) increasing the distance between the two lines
- (d) all of the above

Ans: d

1384. When a wave propagates on a transmission line, it suffers reflection several times at

- (a) tapping
- (b) load end
- (c) sending end
- (d) sending and other end

Ans: d

1385. Which of the following statements is incorrect?

- (a) Station batteries are used to operate relay only
- (b) The lightning arresters are basically surge diverters
- (c) An impedance relay has maximum fault current when fault occurs near the relay
- (d) A high speed relay has an operation of 1 to 2 cycles

Ans: a

1386. Discrimination between main and back up protection is provided by the use of relays which are

- (a) fast
- (b) sensitive
- (c) slow
- (d) none of the above

Ans: c

1387. Induction cup relay is operated due to changes in

- (a) current
- (b) voltage
- (c) impedance
- (d) all of the above

Ans: d

1388. A.C. network analyser is used to solve problems of

- (a) load flow
- (b) load flow and short-circuit
- (c) load flow and stability
- (d) load flow, short-circuit and stability

Ans: d

1389. Which of the following statements is incorrect ?

- (a) Lightning arrestors are used before the switchgear
- (b) Shunt reactors are used as compensation reactors
- (c) The peak short current is $(1.8 \times \sqrt{2})$ times the A.C. component
- (d) The MVA at fault is equal to base MVA divided by per unit equivalent fault reactance

Ans: a

1390. Short-circuit currents are due to

- (a) single phase to ground faults
- (b) phase to phase faults
- (c) two phase to ground faults
- (d) any of these

Ans: d

1391. To reduce short circuit fault currents are used.

- (a) reactors
- (b) resistors
- (c) capacitors
- (d) none of the above

Ans: a

1392. Bus coupler is very essential in arrangement

- (a) single bus
- (b) double bus, double breaker
- (c) main and transfer bus
- (d) all of the above

Ans: c

1393. For cost and safety, the outdoor substations are installed for voltages above

- (a) 11 kV
- (b) 33 kV
- (c) 60kV
- (d) 110kV

Ans: b

1394. The short circuit in any winding of the transformer is the result of

- (a) mechanical vibration
- (b) insulation failure
- (c) loose connection
- (d) impulse voltage

Ans: d

1395. relays are used for phase faults on long line.

- (a) Impedance
- (b) Reactance
- (c) Either of the above
- (d) None of the above

Ans: a

1396. For which of the following protection from negative sequence currents is provided ?

- (a) Generators
- (b) Motors
- (c) Transmission line
- (d) Transformers

Ans: a

1397. relay is preferred for phase fault on short transmission line.

- (a) Induction type
- (b) Reactance
- (c) Impedance
- (d) None of the above

Ans: b

1398. Distance relays are generally

- (a) split-phase relays
- (b) reactance relays
- (c) impedance relays
- (d) none of the above

Ans: d

1399. For which of the following ratings of the transformer differential protection is recommended ?

- (a) above 30 kVA.
- (b) equal to and above 5 MVA
- (c) equal to and above 25 MVA
- (d) none of the above

Ans: b

1400. A _____ is used to measure the stator % winding temperature of the generator.

- (a) thermocouple
- (b) pyrometer
- (c) resistance thermometer
- (d) thermometer

Ans: c

1401. The under voltage relay can be used for

- (a) generators
- (b) busbars
- (c) transformers
- (d) all of the above

Ans: d

1402. The relay with inverse time characteristic will operate within

- (a) 1.5 sec
- (b) 5 to 10 sec
- (c) 5 to 20 sec
- (d) 20 to 30 sec

Ans: b

1403. The single phasing relays are used for the protection of

- (a) single phase motors only
- (b) two phase motors only
- (c) two single phase motors running in parallel
- (d) three phase motors

Ans: d

1404. Which of the following devices will receive voltage surge first travelling on the transmission line ?

- (a) Lightning arresters
- (b) Relays
- (c) Step-down transformer
- (d) Switchgear

Ans: a

1405. Which of the following parameter can be neglected for a short line ?

- (a) Inductance
- (b) Capacitance
- (c) Resistance
- (d) Reactance

Ans: b

1406. Series reactors should have

- (a) low resistance
- (b) high resistance
- (c) low impedance
- (d) high impedance

Ans: a

1407. Which of the following circuit breakers has high reliability and minimum maintenance ?

- (a) Air blast circuit breakers
- (b) Circuit breaker with SF₆ gas
- (c) Vacuum circuit breakers
- (d) Oil circuit breakers

Ans: b

1408. Arc in a circuit breaker is interrupted at

- (a) zero current
- (b) maximum current
- (c) minimum voltage
- (d) maximum voltage

Ans: a

1409. transmission line has reflection coefficient as one.

- (a) Open circuit
- (b) Short-circuit
- (c) Long
- (d) None of the above

Ans: a

1410. What will be the reflection co-efficient of the wave of load connected to transmission line if surge impedance of the line is equal to load ?

- (a) Zero
- (b) Unity
- (c) Infinity
- (d) None of the above

Ans: a

1411. The inverse definite mean time relays are used for over current and earth fault protection of transformer against

- (a) heavy loads
- (b) internal short-circuits

- (c) external short-circuits
- (d) all of the above

Ans: b

1412. Over voltage protection is recommended for

- (a) hydro-electric generators
- (b) steam turbine generators
- (c) gas turbine generators
- (d) all of the above

Ans: d

1413. Air blast circuit breakers for 400 kV power system are designed to operate in

- (a) 100 microsecond
- (b) 50 millisecond
- (c) 0.5 sec
- (d) 0.1 sec

Ans: b

1414. Overfluxing protection is recommended for

- (a) distribution transformer
- (b) generator transformer of the power plant
- (c) auto-transformer of the power plant
- (d) station transformer of the power plant

Ans: b

1415. Series capacitors are used to

- (a) compensate for line inductive reactance
- (b) compensate for line capacitive reactance
- (c) improve line voltage
- (d) none of the above

Ans: a

1416. Admittance relay is _____ relay.

- (a) impedance
- (b) directional
- (c) non-directional
- (d) none of the above

Ans: b

1417. The material used for fuse must have

- (a) low melting point and high specific resistance
- (b) low melting point and -low specific resistance
- (c) high melting point and low specific resistance
- (d) low melting point and any specific resistance

Ans: a

1418. If the fault occurs near the impedance relay, the VII ratio will be

- (a) constant for all distances
- (b) lower than that of if fault occurs away from the relay
- (c) higher than that of if fault occurs away from the relay

(d) none of the above

Ans: b

1419. The torque produced in induction type relay (shaded pole structure) is

- (a) inversely proportional to the current
- (b) inversely proportional to the square of the current
- (c) proportional to the current
- (d) proportional to square of the current

Ans: b

1420. The steady state stability of the power system can be increased by

- (a) connecting lines in parallel
- (b) connecting lines in series
- (c) using machines of high impedance
- (d) reducing the excitation of machines

Ans: a

1421. The inductive interference between power and communication line can be minimized by

- (a) transposition of the power line
- (b) transposition of the communication line
- (c) both (a) and (b)
- (d) increasing the distance between the conductors

Ans: c

1422. The power loss is an important factor for the design of

- (a) transmission line
- (b) motor
- (c) generator
- (d) feeder

Ans: a

1423. A fuse is connected

- (a) in series with circuit
- (b) in parallel with circuit
- (c) either in series or in parallel with circuit
- (d) none of the above

Ans: a

1424. H.R.C. fuse, as compared to a rewirable fuse, has

- (a) no ageing effect
- (b) high speed of operation
- (c) high rupturing capacity
- (d) all of the above

Ans: d

1425. The fuse rating is expressed in terms of

- (a) current
- (b) voltage
- (c) VAR

(d) kVA

Ans: a

1426. The fuse blows off by

- (a) burning
- (b) arcing
- (c) melting
- (d) none of the above

Ans: c

1427. On which of the following effects of electric current a fuse operates ?

- (a) Photoelectric effect
- (b) Electrostatic effect
- (c) Heating effect
- (d) Magnetic effect

Ans: c

1428. An isolator is installed

- (a) to operate the relay of circuit breaker
- (b) as a substitute for circuit breaker
- (c) always independent of the position of circuit breaker
- (d) generally on both sides of a circuit breaker

Ans: d

1429. A fuse in a motor circuit provides protection against

- (a) overload
- (b) short-circuit and overload
- (c) open circuit, short-circuit and overload
- (d) none of the above

Ans: b

1430. Protection by fuses is generally not used beyond

- (a) 20 A
- (b) 50 A
- (c) 100 A
- (d) 200 A

Ans: c

1431. A fuse is never inserted in

- (a) neutral wire
- (b) negative of D.C. circuit
- (c) positive of D.C. circuit
- (d) phase line

Ans: a

1432. Oil switches are employed for

- (a) low currents circuits
- (b) low voltages circuits
- (c) high voltages and large currents circuits

(d) all circuits

Ans: c

1433. A switchgear is device used for

- (a) interrupting an electrical circuit
- (b) switching an electrical circuit 111.
- (c) switching and controlling an electrical circuit
- (d) switching, controlling and protecting the electrical circuit and equipment

Ans: d

1434. The fuse wire, in D.C. circuits, is inserted in

- (a) negative circuit only
- (b) positive circuit only
- (c) both (a) and (b)
- (d) either (a) or (b)

Ans: c

1435. By which of the following methods is the major portion of the heat generated in a H.R.C. fuse is dissipated ?

- (a) Radiation
- (b) Convection
- (c) Conduction
- (d) All of the above

Ans: c

1436. A short-circuit is identified by

- (a) no current flow
- (b) heavy current flow
- (c) voltage drop
- (d) voltage rise

Ans: b

1437. The information to the circuit breaker under fault conditions is provided by

- (a) relay
- (b) rewirable fuse
- (c) H.R.C. only
- (d) all of the above

Ans: a

1438. To limit short-circuit current in a power system are used.

- (a) earth wires
- (b) isolators
- (c) H.R.C. fuses
- (d) reactors

Ans: d

1439. A balanced 3-phase system consists of

- (a) zero sequence currents only
- (b) positive sequence currents only
- (c) negative and zero sequence currents

(d) zero, negative and positive sequence currents

Ans: b

1440. In a single bus-bar system there will be complete shut down when

- (a) fault occurs on the bus itself
- (b) fault occurs on neutral line
- (c) two or more faults occur simultaneously
- (d) fault occurs with respect to earthing

Ans: a

1441. The use of _____ instrument is merely confined within laboratories as standardizing instruments.

- (a) absolute
- (b) indicating
- (c) recording
- (d) integrating

Ans: a

1442. Which of the following instruments indicate the instantaneous value of the electrical quantity being measured at the time at which it is being measured?

- (a) Absolute instruments
- (b) Indicating instruments
- (c) Recording instruments
- (d) Integrating instruments

Ans: b

1443. _____ instruments are those which measure the total quantity of electricity delivered in a particular time.

- (a) Absolute
- (b) Indicating
- (c) Recording
- (d) Integrating

Ans: d

1444. Which of the following are integrating instruments?

- (a) Ammeters
- (b) Voltmeters
- (c) Wattmeters
- (d) Ampere-hour and watt-hour meters

Ans: d

1445. Resistances can be measured with the help of

- (a) wattmeters
- (b) voltmeters
- (c) ammeters
- (d) ohmmeters and resistance bridges
- (e) all of the above

Ans: d

1446. According to application, instruments are classified as

- (a) switch board
- (b) portable
- (c) both (a) and (b)
- (d) moving coil
- (e) moving iron
- (f) both (d) and (e)

Ans: c

1447. Which of the following essential features is possessed by an indicating instrument?

- (a) Deflecting device
- (b) Controlling device
- (c) Damping device
- (d) All of the above

Ans: d

1448. A _____ device prevents the oscillation of the moving system and enables the latter to

reach its final position quickly

- (a) deflecting
- (b) controlling
- (c) damping
- (d) any of the above

Ans: c

1449. The spring material used in a spring control device should have the following property.

- (a) Should be non-magnetic
- (b) Must be of low temperature co-efficient
- (c) Should have low specific resistance
- (d) Should not be subjected to fatigue
- (e) All of the above

Ans: e

1450. Which of the following properties a damping oil must possess?

- (a) Must be a good insulator
- (b) Should be non-evaporating
- (c) Should not have corrosive action upon the metal of the vane
- (d) The viscosity of the oil should not change with the temperature
- (e) All of the above

Ans: e

1451. A moving-coil permanent-magnet instrument can be used as _____ by using a low resistance shunt.

- (a) ammeter
- (b) voltmeter

- (c) flux-meter
- (d) ballistic galvanometer

Ans: a

1452. A moving-coil permanent-magnet instrument can be used as flux-meter

- (a) by using a low resistance shunt
- (b) by using a high series resistance
- (c) by eliminating the control springs
- (d) by making control springs of large moment of inertia

Ans: c

1453. Which of the following devices may be used for extending the range of instruments?

- (a) Shunts
- (b) Multipliers
- (c) Current transformers
- (d) Potential transformers
- (e) All of the above

Ans: e

1454. An induction meter can handle current upto

- (a) 10 A
- (b) 30 A
- (c) 60 A
- (d) 100 A

Ans: d

1455. For handling greater currents induction wattmeters are used in conjunction with

- (a) potential transformers
- (b) current transformers
- (c) power transformers
- (d) either of the above
- (e) none of the above

Ans: b

1456. Induction type single phase energy meters measure electric energy in

- (a) kW
- (b) Wh
- (c) kWh
- (d) VAR
- (e) None of the above

Ans: c

1457. Most common form of A.C. meters met with in every day domestic and industrial installations are

- (a) mercury motor meters
- (b) commutator motor meters
- (c) induction type single phase energy meters

(d) all of the above

Ans: c

1458. Which of the following meters are not used on D.C. circuits

- (a) Mercury motor meters
- (b) Commutator motor meters
- (c) Induction meters
- (d) None of the above

Ans: c

1459. Which of the following is an essential part of a motor meter?

- (a) An operating torque system
- (b) A braking device
- (c) Revolution registering device
- (d) All of the above

Ans: d

1460. A potentiometer may be used for

- (a) measurement of resistance
- (b) measurement of current
- (c) calibration of ammeter
- (d) calibration of voltmeter
- (e) all of the above

Ans: e

1461. is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another,

- (a) Tangent galvanometer
- (b) Meggar
- (c) Current transformer
- (d) None of the above

Ans: b

1462. The household energy meter is

- (a) an indicating instrument
- (b) a recording instrument
- (c) an integrating instrument
- (d) none of the above

Ans: c

1463. The pointer of an indicating instrument should be

- (a) very light
- (b) very heavy
- (c) either (a) or (b)
- (d) neither (a) nor (b)

Ans: a

1464. The chemical effect of current is used in

- (a) D.C. ammeter hour meter
- (b) D.C. ammeter
- (c) D.C. energy meter
- (d) none of the above

Ans: a

1465. In majority of instruments damping is provided by

- (a) fluid friction
- (b) spring
- (c) eddy currents
- (d) all of the above

Ans: c

1466. An ammeter is a

- (a) secondary instrument
- (b) absolute instrument
- (c) recording instrument
- (d) integrating instrument

Ans: a

1467. In a portable instrument, the controlling torque is provided by

- (a) spring
- (b) gravity
- (c) eddy currents
- (d) all of the above

Ans: a

1468. The disc of an instrument using eddy current damping should be of

- (a) conducting and magnetic material
- (b) non-conducting and magnetic material
- (c) conducting and non-magnetic material
- (d) none of the above

Ans: c

1469. The switch board instruments

- (a) should be mounted in vertical position
- (b) should be mounted in horizontal position
- (c) either (a) or (b)
- (d) neither (a) nor (b)

Ans: a

1470. The function of shunt in an ammeter is to

- (a) by pass the current
- (b) increase the sensitivity of the ammeter
- (c) increase the resistance of ammeter
- (d) none of the above

Ans: a

1471. The multiplier and the meter coil in a voltmeter are in

- (a) series
- (b) parallel
- (c) series-parallel
- (d) none of the above

Ans: a

1472. A moving iron instrument can be used for

- (a) D.C. only
- (b) A.C. only
- (c) both D.C. and A.C.

Ans: c

1473. The scale of a rectifier instrument is

- (a) linear
- (b) non-linear
- (c) either (a) or (b)
- (d) neither (a) nor (b)

Ans: a

1474. For measuring current at high frequency we should use

- (a) moving iron instrument
- (b) electrostatic instrument
- (c) thermocouple instrument
- (d) none of the above

Ans: c

1475. The resistance in the circuit of the moving coil of a dynamometer wattmeter should be

- (a) almost zero
- (b) low
- (c) high
- (d) none of the above

Ans: c

1476. A dynamometer wattmeter can be used for

- (a) both D.C. and A.C.
- (b) D.C. only
- (c) A.C. only
- (d) any of the above

Ans: a

1477. An induction wattmeter can be used for

- (a) both D.C. and A.C.

- (b) D.C. only
- (c) A.C. only
- (d) any of the above

Ans: b

1478. The pressure coil of a wattmeter should be connected on the supply side of the current coil when

- (a) load impedance is high
- (b) load impedance is low
- (c) supply voltage is low
- (d) none of the above

Ans: a

1479. In a low power factor wattmeter the pressure coil is connected

- (a) to the supply side of the current coil
- (b) to the load side of the current coil
- (c) in any of the two meters at connection
- (d) none of the above

Ans: b

1480. In a low power factor wattmeter the compensating coil is connected

- (a) in series with current coil
- (b) in parallel with current coil
- (c) in series with pressure coil
- (d) in parallel with pressure coil

Ans: c

1481. In a 3-phase power measurement by two wattmeter method, both the watt meters had identical readings. The power factor of the load was

- (a) unity
- (b) 0.8 lagging
- (c) 0.8 leading
- (d) zero

Ans: a

1482. In a 3-phase power measurement by two wattmeter method the reading of one of the wattmeters was zero. The power factor of the load must be

- (a) unity
- (b) 0.5
- (c) 0.3
- (d) zero

Ans: b

1483. The adjustment of position of shading bands, in an energy meter is done to provide

- (a) friction compensation
- (b) creep compensation
- (c) braking torque
- (d) none of the above

Ans: a

1484. An ohmmeter is a

- (a) moving iron instrument
- (b) moving coil instrument
- (c) dynamometer instrument
- (d) none of the above

Ans: b

1485. When a capacitor was connected to the terminal of ohmmeter, the pointer indicated a low resistance initially and then slowly came to infinity position. This shows that capacitor is

- (a) short-circuited
- (b) all right
- (c) faulty

Ans: b

1486. For measuring a very high resistance we should use

- (a) Kelvin's double bridge
- (b) Wheat stone bridge
- (c) Meggar
- (d) None of the above

Ans: c

1487. The electrical power to a megger is provided by

- (a) battery
- (b) permanent magnet D.C. generator
- (c) AC. generator
- (d) any of the above

Ans: b

1488. In a megger controlling torque is provided by

- (a) spring
- (b) gravity
- (c) coil
- (d) eddy current

Ans: c

1489. The operating voltage of a meggar is about

- (a) 6 V
- (b) 12 V
- (c) 40 V
- (d) 100 V

Ans: d

1490. Murray loop test can be used for location of

- (a) ground fault on a cable

- (b) short circuit fault on a cable
- (c) both the ground fault and the short-circuit fault
- (d) none of the above

Ans: c

1491. Which of the following devices should be used for accurate measurement of low D.C. voltage ?

- (a) Small range moving coil voltmeter
- (b) D.C. potentiometer
- (c) Small range thermocouple voltmeter
- (d) None of the above

Ans: b

1492. It is required to measure the true open circuit e.m.f. of a battery. The best device is

- (a) D.C. voltmeter
- (b) Ammeter and a known resistance
- (c) D.C. potentiometer
- (d) None of the above

Ans: c

1493. A voltage of about 200 V can be measured

- (a) directly by a D.C. potentiometer
- (b) a D.C. potentiometer in conjunction with a volt ratio box
- (c) a D.C. potentiometer in conjunction with a known resistance
- (d) none of the above

Ans: b

1494. A direct current can be measured by

- (a) a D.C. potentiometer directly
- (b) a D.C. potentiometer in conjunction with a standard resistance
- (c) a D.C. potentiometer in conjunction with a volt ratio box
- (d) none of the above

Ans: b

1495. To measure a resistance with the help of a potentiometer it is

- (a) necessary to standardise the potentiometer
- (b) not necessary to standardise the potentiometer
- (c) necessary to use a volt ratio box in conjunction with the potentiometer
- (d) none of the above

Ans: b

1496. A phase shifting transformer is used in conjunction with

- (a) D.C. potentiometer
- (b) Drysdale potentiometer
- (c) A.C. co-ordinate potentiometer
- (d) Crompton potentiometer

Ans: b

1497. Basically a potentiometer is a device for

- (a) comparing two voltages
- (b) measuring a current
- (c) comparing two currents
- (d) measuring a voltage
- (e) none of the above

Ans: a

1498. In order to achieve high accuracy, the slide wire of a potentiometer should be

- (a) as long as possible
- (b) as short as possible
- (c) neither too small not too large
- (d) very thick

Ans: a

1499. To measure an A. C. voltage by using an A.C. potentiometer, it is desirable that the supply for the potentiometer is taken

- (a) from a source which is not the same as the unknown voltage
- (b) from a battery
- (c) from the same source as the unknown voltage
- (d) any of the above

Ans: c

1500. The stator of phase shifting transformer for use in conjunction with an A.C. potentiometer usually has a

- (a) single-phase winding
- (b) two-phase winding
- (c) three-phase winding
- (d) any of the above

Ans: b

1501. In an AC. co-ordinate potentiometer, the currents in the phase and quadrature potentiometer are adjusted to be

- (a) out of phase by 90°
- (b) out of phase by 60°
- (c) out of phase by 30°
- (d) out of phase by 0°
- (e) out of phase by 180°

Ans: a

1502. A universal RLC bridge uses

- (a) Maxwell bridge configuration for measurement of inductance and De Santa's bridge for measurement of capacitance
- (b) Maxwell Wein bridge for measurement of inductance and modified De Santy's bridge for measurement of capacitance

- (c) Maxwell Wein bridge for measurement of inductance and Wein bridge for measurement of capacitance
- (d) Any of the above.

Ans: b

1503. For measurements on high voltage capacitors, the suitable bridge is

- (a) Wein bridge
- (b) Modified De Santy's bridge
- (c) Schering bridge
- (d) Any of the above
- (e) None of the above

Ans: c

1504. In an Anderson bridge, the unknown inductance is measured in terms of

- (a) known inductance and resistance
- (b) known capacitance and resistance
- (c) known resistance
- (d) known inductance

Ans: b

1505. Wagner earthing device is used to eliminate errors due to

- (a) electrostatic coupling
- (b) electromagnetic coupling
- (c) both (a) and (b)
- (d) none of the above

Ans: a

1506. For measurement of mutual inductance we can use

- (a) Anderson bridge
- (b) Maxwell's bridge
- (c) Heaviside bridge
- (d) Any of the above

Ans: c

1507. For measurement of inductance having high value, we should use

- (a) Maxwell's bridge
- (b) Maxwell Wein bridge
- (c) Hay's bridge
- (d) Any of the above

Ans: c

1508. If the current in a capacitor leads the voltage by 80° , the loss angle of the capacitor is

- (a) 10°
- (b) 80°
- (c) 120°
- (d) 170°

Ans: a

1509. In a Schering bridge the potential of the detector above earth potential is

- (a) a few volts only
- (b) 1 kV
- (c) 5 kV
- (d) 10 kV

Ans: a

1510. To avoid the effect of stray magnetic field in A.C. bridges we can use

- (a) magnetic screening
- (b) Wagner earthing device
- (c) wave filters
- (d) any of the above

Ans: a

1511. If an inductance is connected in one arm of bridge and resistances in the remaining three arms

- (a) the bridge can always be balanced
- (b) the bridge cannot be balanced
- (c) the bridge can be balanced if the resistances have some specific values

Ans: b

1512. A power factor meter has

- (a) one current circuit and two pressure circuits
- (b) one current circuit and one pressure circuit
- (c) two current circuits and one pressure circuit
- (d) none of the above

Ans: a

1513. The two pressure coils of a single phase power factor meter have

- (a) the same dimensions and the same number of turns
- (b) the same dimension but different number of turns
- (c) the same number of turns but different dimensions
- (d) none of the above

Ans: a

1514. In a single phase power factor meter the phase difference between the currents in the two pressure coils is

- (a) exactly 0°
- (b) approximately 0°
- (c) exactly 90°
- (d) approximately 90°

Ans: c

1515. In a dynamometer 3-phase power factor meter, the planes of the two moving coils are at

- (a) 0°
- (b) 60°
- (c) 90°
- (d) 120°

Ans: d

1516. In a vibrating reed frequency meter the natural frequencies of two adjacent reeds have a difference of

- (a) 0.1 Hz
- (b) 0.25 Hz
- (c) 0.5 Hz
- (d) 1.5 Hz

Ans: c

1517. In a Weston frequency meter, the magnetic axes of the two fixed coils are

- (a) parallel
- (b) perpendicular
- (c) inclined at 60°
- (d) inclined at 120°

Ans: b

1518. Weston frequency meter is

- (a) moving coil instrument
- (b) moving iron instrument
- (c) dynamometer instrument
- (d) none of the above

Ans: b

1519. A Weston synchronoscope is a

- (a) moving coil instrument
- (b) moving iron instrument
- (c) dynamometer instrument
- (d) none of the above

Ans: c

1520. In a Weston synchronoscope, the fixed coils are connected across

- (a) bus-bars
- (b) incoming alternator
- (c) a lamp
- (d) none of the above

Ans: b

1521. In Weston synchronoscope the moving coil is connected across

- (a) bus-bars
- (b) incoming alternator
- (c) fixed coils
- (d) any of the above

Ans: a

1522. The power factor of a single phase load can be calculated if the instruments available are

- (a) one voltmeter and one ammeter
- (b) one voltmeter, one ammeter and one wattmeter
- (c) one voltmeter, one ammeter and one energy meter
- (d) any of the above

Ans: b

1523. The desirable static characteristics of a measuring system are

- (a) accuracy and reproducibility
- (b) accuracy, sensitivity and reproducibility
- (c) drift and dead zone
- (d) static error

Ans: b

1524. The ratio of maximum displacement deviation to full scale deviation of the instrument is called

- (a) static sensitivity
- (b) dynamic deviation
- (c) linearity
- (d) precision or accuracy

Ans: c

1525. Systematic errors are

- (a) instrumental errors
- (b) environmental errors
- (c) observational errors
- (d) all of the above

Ans: d

1526. Standard resistor is made from

- (a) platinum
- (b) maganin
- (c) silver
- (d) nichrome

Ans: b

1527. Commonly used standard capacitor is

- (a) spherical type
- (b) concentric cylindrical type
- (c) electrostatic type

(d) multilayer parallel plate type

Ans: b

1528. Operating torques in analogue instruments are

- (a) deflecting and control
- (b) deflecting and damping
- (c) deflecting, control and damping
- (d) vibration and balancing

Ans: c

1529. Commonly used instruments in power system measurement are

- (a) induction
- (b) moving coil or iron
- (c) rectifier
- (d) electrostatic

Ans: a

1530. Damping of the Ballistic galvanometer is made small to

- (a) get first deflection large
- (b) make the system oscillatory
- (c) make the system critically damped
- (d) get minimum overshoot

Ans: a

1531. If an instrument has cramped scale for larger values, then it follows

- (a) square law
- (b) logarithmic law
- (c) uniform law
- (d) none of the above

Ans: b

1532. Volt box is a component to

- (a) extend voltage range
- (b) measure voltage
- (c) compare voltage in a box
- (d) none of the above

Ans: a

1533. E.m.f. of a Weston cell is accurately measured by

- (a) electrostatic voltmeter
- (b) hot wire voltmeter
- (c) isothermal voltmeter
- (d) electrodynamic voltmeter

Ans: a

1534. The gravity controlled instrument has crowded scale because current is proportional to

- (a) balancing weight
- (b) deflection angle
- (c) sine of deflection angle

Ans: c

1535. A sensitive galvanometer produces large deflection for a

- (a) small value of current
- (b) large value of current
- (c) large value of power
- (d) large value of voltage
- (e) none of the above

Ans: a

1536. A multirange instrument has

- (a) multiple shunt or series resistances inside the meter
- (b) multicoin arrangement
- (c) variable turns of coil
- (d) multi range meters inside the measurement system
- (e) any of the above

Ans: a

1537. The rectifier instrument is not free from

- (a) temperature error
- (b) wave shape error
- (c) frequency error
- (d) all of the above

Ans: c

1538. Alternating current is measured by

- (a) induction ammeter
- (b) permanent magnet type ammeter
- (c) electrostatic ammeter
- (d) moving iron repulsion type voltmeter

Ans: a

1539. Most sensitive galvanometer is

- (a) elastic galvanometer
- (b) vibration galvanometer
- (c) Duddell galvanometer
- (d) spot ballistic galvanometer

Ans: d

1540. Instrument transformers are

- (a) potential transformers

- (b) current transformers
- (c) both (a) and (b)
- (d) power transformers

Ans: c

1541. An instrument transformer is used to extend the range of

- (a) induction instrument
- (b) electrostatic instrument
- (c) moving coil instrument
- (d) any of the above

Ans: a

1542. Wattmeter cannot be designed on the principle of

- (a) electrostatic instrument
- (b) thermocouple instrument
- (c) moving iron instrument
- (d) electrodynamic instrument

Ans: c

1543. In an energymeter braking torque is produced to

- (a) safe guard it against creep
- (b) brake the instrument
- (c) bring energy meter to stand still
- (d) maintain steady speed and equal to driving torque

Ans: d

1544. Various adjustments in an energy meter include

- (a) light load or friction
- (b) lag and creep
- (c) overload and voltage compensation
- (d) temperature compensation
- (e) all of the above

Ans: e

1545. The power of a n-phase circuit can be measured by using a minimum of

- (a) $(n - 1)$ wattmeter elements
- (b) n wattmeter elements
- (c) $(n + 1)$ wattmeter elements
- (d) $2n$ wattmeter elements

Ans: a

1546. Two holes in the disc of energymeter are drilled at the opposite sides of the spindle to

- (a) improve its ventilation
- (b) eliminate creeping at no load
- (c) increase its deflecting torque
- (d) increase its braking torque

Ans: b

1547. 107. Which of the following is measured by using a vector voltmeter ?

- (a) Amplifier gain and phase shift
- (b) Filler transfer functions
- (c) Complex insersion loss
- (d) All of the above

Ans: d

1548. The principle on which vector voltmeter is based is

- (a) that it works on the principle of complex variation
- (b) that it measures the response of linear ramp voltage
- (c) same as digital meter
- (d) that it measures the amplitude of a single at two points and at the same time measures their phase difference

Ans: d

1549. To measure radio frequency, the suitable frequency meter is

- (a) Weston frequency meter
- (b) reed vibrator frequency meter
- (c) heterodyne frequency meter
- (d) electrical resonance frequency meter

Ans: c

1550. What is the primary function of a surge arrester in an electrical system?

- A. Voltage amplification
- B. Current reduction
- C. Power factor correction
- D. Protection against voltage surges

Answer: D

1551. Which type of voltage spike is a surge arrester specifically designed to protect against?

- A. Steady-state voltage
- B. Transient voltage
- C. Alternating voltage
- D. DC voltage

Answer: B

1552. In a power distribution system, where is a surge arrester typically installed for effective protection?

- A. Near the generator
- B. Near the transformer
- C. Near the load center
- D. Near the circuit breaker

Answer: C

1553. What type of material is commonly used for the construction of surge arresters?

- A. Copper
- B. Aluminum
- C. Silicon
- D. Zinc

Answer: C

1554. What is the primary mechanism by which surge arresters divert excessive voltage?

- A. Voltage absorption
- B. Voltage attenuation
- C. Voltage diversion
- D. Voltage reflection

Answer: C

1555. How does a surge arrester differ from a circuit breaker in terms of operation?

- A. Circuit breakers protect against overcurrent; surge arresters protect against voltage surges.
- B. Surge arresters protect against overcurrent; circuit breakers protect against voltage surges.
- C. Both protect against overcurrent.
- D. Both protect against voltage surges.

Answer: A

1556. What is the significance of the “sparkover voltage” rating in surge arresters?

- A. The voltage at which the arrester starts conducting
- B. The voltage at which the arrester stops conducting
- C. The maximum operating voltage
- D. The voltage required for circuit initiation

Answer: A

1557. Why is it important for surge arresters to have a low residual voltage?

- A. To increase power factor
- B. To reduce energy consumption
- C. To minimize potential damage to equipment
- D. To regulate voltage fluctuations

Answer: C

1558. How do metal oxide surge arresters differ from other types?

- A. They have a higher sparkover voltage.
- B. They exhibit nonlinear voltage-current characteristics.
- C. They are made of copper.
- D. They are only effective for DC systems.

Answer: B

1559. What role does the “follow current” play in surge arrester operation?

- A. It represents the maximum operating current.
- B. It indicates the current that follows the voltage surge.
- C. It is the residual current after sparkover.
- D. It is unrelated to surge arrester operation.

Answer: C

1560. What is the purpose of the “energy handling capability” specification in surge arresters?

- A. To measure the speed of surge diversion
- B. To assess the arrester’s ability to absorb and dissipate energy
- C. To determine the sparkover voltage
- D. To calculate the follow current

Answer: B

1561. How do surge arresters contribute to the protection of sensitive electronic equipment in power systems?

- A. By increasing voltage levels
- B. By reducing power factor
- C. By diverting voltage surges to the ground
- D. By regulating current flow

Answer: C

1562. What is the role of a surge counter in the maintenance of surge arresters?

- A. To measure voltage levels
- B. To count the number of surges diverted
- C. To regulate the sparkover voltage
- D. To monitor follow current

Answer: B

1563. How does the “let-through voltage” of a surge arrester impact the connected equipment?

- A. Higher let-through voltage protects equipment better.
- B. Lower let-through voltage provides better protection.
- C. Let-through voltage has no impact on equipment protection.
- D. Let-through voltage determines equipment power consumption.

Answer: B

1564. What is the primary reason for using a combination of surge arresters with different voltage ratings in a power system?

- A. To increase the overall power factor
- B. To provide redundancy in surge protection
- C. To amplify the transient voltage
- D. To reduce the energy handling capability

Answer: B

1565. In what scenarios might a surge arrester fail to provide effective protection?

- A. During low-current conditions
- B. During high-current conditions
- C. During steady-state voltage
- D. During normal operating conditions

Answer: B

1566. How does the “impulse ratio” influence the performance of a surge arrester?

- A. Higher impulse ratio improves performance.
- B. Lower impulse ratio improves performance.
- C. Impulse ratio has no impact on performance.
- D. Impulse ratio regulates sparkover voltage.

Answer: A

1567. What measures can be taken to enhance the service life of surge arresters?

- A. Increasing the sparkover voltage
- B. Reducing the energy handling capability
- C. Implementing proper grounding
- D. Using surge arresters with the same voltage rating

Answer: C

1568. How does the location of a surge arrester installation impact its effectiveness?

- A. Proximity to the generator enhances performance.
- B. Proximity to the load center enhances performance.
- C. Installation location has no impact on performance.
- D. Proximity to the circuit breaker enhances performance.

Answer: B

1569. What is the role of the “residual voltage” specification in surge arrester performance?

- A. It determines the sparkover voltage.
- B. It indicates the voltage remaining across the arrester after surge diversion.
- C. It measures the follow current.
- D. It regulates the impulse ratio.

Answer: B

1570. What is the purpose of the “protective level” specification in surge arresters?

- A. To define the maximum voltage withstand capability
- B. To determine the follow current magnitude
- C. To indicate the voltage at which the arrester starts diverting surges
- D. To regulate the energy handling capability

Answer: C

1571. Why is it crucial to consider the ambient temperature when selecting surge arresters?

- A. Ambient temperature affects the surge arrester's color
- B. Surge arresters are not affected by ambient temperature
- C. To ensure the arrester's specified ratings are maintained
- D. Ambient temperature influences the sparkover voltage

Answer: C

1572. What role does the “varistor” play in the operation of a metal oxide surge arrester?

- A. To regulate the sparkover voltage
- B. To provide mechanical support to the arrester
- C. To absorb and divert surge currents
- D. To measure the follow current

Answer: C

1573. How does the voltage protection level of a surge arrester impact the connected equipment?

- A. Higher voltage protection level provides better protection
- B. Lower voltage protection level provides better protection
- C. Voltage protection level has no impact on equipment protection
- D. Voltage protection level determines the follow current

Answer: B

1574. What is the consequence of exceeding the maximum energy handling capability of a surge arrester?

- A. Improved surge protection
- B. Reduced follow current
- C. Potential damage to the surge arrester
- D. Increased sparkover voltage

Answer: C

1575. In surge arrester applications, what is the function of the “ground lead”?

- A. To regulate the sparkover voltage
- B. To provide a low-impedance path to the ground
- C. To measure the follow current
- D. To determine the energy handling capability

Answer: B

1576. How do surge arresters protect against overvoltages caused by lightning strikes?

- A. By increasing the follow current
- B. By reducing the sparkover voltage
- C. By diverting the lightning-induced surge to the ground
- D. By regulating the impulse ratio

Answer: C

1577. What is the significance of the “voltage protection level residual voltage” in surge arrester specifications?

- A. It indicates the voltage at which the arrester starts conducting
- B. It represents the maximum operating voltage
- C. It defines the voltage across the arrester after surge diversion
- D. It measures the follow current

Answer: C

1578. What is the role of the “arrester duty cycle” in surge arrester applications?

- A. To regulate the sparkover voltage
- B. To determine the energy handling capability
- C. To measure the follow current
- D. To assess the arrester’s ability to handle repetitive surges

Answer: D

1579. How does the “aging rate” specification impact the long-term performance of surge arresters?

- A. Higher aging rate improves performance
- B. Lower aging rate improves performance
- C. Aging rate has no impact on performance
- D. Aging rate influences the energy handling capability

Answer: B

1580. What is the primary difference between surge arresters and lightning rods in terms of functionality?

- A. Surge arresters provide a low-impedance path to the ground, while lightning rods absorb lightning strikes.
- B. Surge arresters regulate voltage fluctuations, while lightning rods divert high-frequency currents.
- C. Surge arresters protect against voltage surges, while lightning rods provide a path for lightning to reach the ground.
- D. Surge arresters control overcurrent conditions, while lightning rods enhance power factor.

Answer: C

1581. What is the significance of the “response time” specification in surge arrester performance?

- A. It measures the time it takes for the arrester to conduct after a surge event.
- B. It indicates the duration of the follow current.
- C. It regulates the sparkover voltage.
- D. It measures the energy handling capability.

Answer: A

1582. How do surge arresters contribute to the prevention of insulation breakdown in electrical systems?

- A. By increasing the sparkover voltage
- B. By regulating power factor
- C. By providing a low-impedance path for surges
- D. By controlling the let-through voltage

Answer: C

1583. What role does the “self-extinguishing capability” play in surge arrester safety?

- A. It measures the follow current magnitude.
- B. It regulates the sparkover voltage.
- C. It ensures the arrester extinguishes follow current quickly.
- D. It determines the energy handling capability.

Answer: C

1584. Why is it essential for surge arresters to be properly grounded?

- A. Grounding increases the sparkover voltage.
- B. Proper grounding reduces the energy handling capability.
- C. Grounding provides a low-impedance path for surge currents.
- D. Grounding has no impact on surge arrester performance.

Answer: C

1585. How does the “let-through energy” specification impact the protection provided by a surge arrester?

- A. Higher let-through energy provides better protection.
- B. Lower let-through energy provides better protection.
- C. Let-through energy has no impact on protection.
- D. Let-through energy determines the sparkover voltage.

Answer: B

1586. What is the purpose of the “insulation coordination” concept in surge arrester design?

- A. To improve power factor correction.
- B. To optimize the impulse ratio.
- C. To ensure compatibility with system insulation levels.
- D. To regulate the sparkover voltage.

Answer: C

1587. How does the “continuous operating voltage” specification influence surge arrester selection?

- A. It determines the energy handling capability.
- B. It regulates the sparkover voltage.
- C. It indicates the maximum continuous voltage the arrester can withstand.
- D. It measures the follow current.

Answer: C

1588. What challenges may arise if surge arresters are not periodically inspected and maintained?

- A. Reduced sparkover voltage
- B. Increased follow current
- C. Enhanced energy handling capability
- D. Potential degradation and failure

Answer: D

1589. capability” specification impact surge arrester performance in repetitive surge events?

- A. Higher duty cycle withstand capability improves performance.
- B. Lower duty cycle withstand capability improves performance.
- C. Duty cycle withstand capability has no impact on performance.
- D. Duty cycle withstand capability determines the sparkover voltage.

Answer: A

1590. How does the “pressure relief capability” contribute to the safety of surge arresters?

- A. It regulates the sparkover voltage.
- B. It ensures faster response time.
- C. It prevents arrester overheating by releasing internal pressure.
- D. It determines the let-through energy.

Answer: C

1591. In terms of construction, what material is commonly used for the varistor in a surge arrester?

- A. Copper
- B. Silicon
- C. Aluminum
- D. Zinc

Answer: B

1592. What is the purpose of the “creepage distance” in the design of surge arresters?

- A. To measure the follow current
- B. To determine the sparkover voltage
- C. To provide mechanical support
- D. To prevent arcing across the arrester surface

Answer: D

1593. How does the “overvoltage protection level” specification relate to the voltage protection level of a surge arrester?

- A. It represents the minimum voltage the arrester can handle.
- B. It is equivalent to the sparkover voltage.
- C. It indicates the maximum voltage the arrester can withstand.
- D. It measures the energy handling capability.

Answer: B

1594. How does the “nonlinear resistance” characteristic of a varistor in a surge arrester contribute to surge protection?

- A. It minimizes follow current.
- B. It enhances the sparkover voltage.
- C. It provides a low-impedance path during surges.
- D. It determines the let-through energy.

Answer: C

1595. What is the significance of the “class” designation in surge arrester specifications?

- A. It determines the energy handling capability.
- B. It regulates the sparkover voltage.
- C. It indicates the arrester's response time.
- D. It defines the application and performance characteristics.

Answer: D

1596. How does the “temporary overvoltage withstand capability” specification contribute to surge arrester performance?

- A. It measures the energy handling capability.
- B. It indicates the maximum continuous voltage the arrester can withstand.
- C. It assesses the arrester's ability to handle temporary overvoltages.
- D. It determines the impulse ratio.

Answer: C

1597. What is the role of the “follow current extinguishing time” in surge arrester specifications?

- A. To regulate the sparkover voltage.
- B. To measure the follow current magnitude.
- C. To determine the energy handling capability.
- D. To assess how quickly the arrester extinguishes follow current.

Answer: D

1598. What is the purpose of the “residual voltage at rated current” specification in surge arrester performance?

- A. To determine the impulse ratio.
- B. To measure the sparkover voltage.
- C. To indicate the voltage remaining across the arrester after rated current.
- D. To assess the arrester's insulation coordination.

Answer: C

1599. How does the “installation category” impact the selection and placement of surge arresters?

- A. It determines the impulse ratio.
- B. It measures the energy handling capability.
- C. It defines the system's insulation coordination.
- D. It indicates the specific application and environment for arrester installation.

Answer: D

1600. What role does the “aging process” play in the performance of surge arresters over time?

- A. Aging process improves surge arrester efficiency.
- B. Aging process accelerates follow current.
- C. Aging process may lead to degradation and reduced efficiency.
- D. Aging process determines the impulse ratio.

Answer: C

1601. How does the “coordinated protection” concept enhance the overall effectiveness of surge protection systems?

- A. Coordinated protection minimizes insulation coordination.
- B. Coordinated protection ensures synchronization with power factor correction.
- C. Coordinated protection optimizes the response time of individual protection devices.
- D. Coordinated protection increases the follow current magnitude.

Answer: C

1602. In surge arrester applications, what does the “maximum follow current” specification indicate?

- A. It measures the energy handling capability.
- B. It determines the sparkover voltage.
- C. It indicates the highest follow current that the arrester can handle.
- D. It regulates the let-through energy.

Answer: C

1603. What is the primary purpose of the “surge arrester duty cycle”?

- A. To measure the energy handling capability.
- B. To assess the arrester’s insulation coordination.
- C. To determine the sparkover voltage.
- D. To evaluate the arrester’s ability to handle repetitive surges.

Answer: D

1604. How does the “monitoring capability” of surge arresters contribute to maintenance practices?

- A. Monitoring capability determines the sparkover voltage.
- B. Monitoring capability counts the number of surges diverted.
- C. Monitoring capability measures the follow current magnitude.
- D. Monitoring capability has no impact on maintenance.

Answer: B

1605. What is the function of the “fault current withstand capability” in surge arresters?

- A. To determine the sparkover voltage.
- B. To regulate the let-through energy.
- C. To assess the arrester’s ability to handle fault currents.
- D. To measure the energy handling capability.

Answer: C

1606. How does the “temperature derating” influence the performance of surge arresters in elevated temperatures?

- A. Temperature derating improves performance.
- B. Temperature derating accelerates follow current.
- C. Temperature derating may be necessary to maintain performance in elevated temperatures.
- D. Temperature derating has no impact on performance.

Answer: C

1607. What is the significance of the “residual voltage at 10 kA” specification in surge arresters?

- A. It determines the sparkover voltage.
- B. It indicates the voltage remaining across the arrester after conducting a 10 kA surge.
- C. It measures the follow current magnitude.
- D. It regulates the let-through energy.

Answer: B

1608. What role does the “continuous operating current” specification play in surge arresters?

- A. It measures the energy handling capability.
- B. It determines the sparkover voltage.
- C. It indicates the maximum continuous current the arrester can handle.
- D. It regulates the let-through energy.

Answer: C

1609. How does the “mounting orientation” specification impact the installation of surge arresters?

- A. Mounting orientation determines the sparkover voltage.
- B. Mounting orientation has no impact on installation.
- C. Mounting orientation influences the follow current magnitude.
- D. Mounting orientation specifies the permissible positions for arrester installation.

Answer: D

1610. What is the significance of the “sealed design” in surge arresters?

- A. Sealed design has no impact on performance.
- B. Sealed design protects the arrester from environmental factors, ensuring longevity and reliability.
- C. Sealed design determines the sparkover voltage.
- D. Sealed design measures the follow current magnitude.

Answer: B

1611. How does the “thermal disconnect” feature enhance surge arrester safety?

- A. Thermal disconnect accelerates follow current.
- B. Thermal disconnect has no impact on safety.
- C. Thermal disconnect disconnects the arrester in case of overheating, preventing potential hazards.
- D. Thermal disconnect determines the sparkover voltage.

Answer: C

1612. What role does the “corrosion resistance” feature play in surge arresters?

- A. Corrosion resistance has no impact on performance.
- B. Corrosion resistance determines the sparkover voltage.
- C. Corrosion resistance enhances the arrester’s resistance to corrosive environments.
- D. Corrosion resistance measures the follow current magnitude.

Answer: C

1613. How does the “modular design” feature contribute to the flexibility of surge arresters in various applications?

- A. Modular design has no impact on flexibility.
- B. Modular design determines the sparkover voltage.
- C. Modular design allows for customization and easy integration into different systems.
- D. Modular design measures the energy handling capability.

Answer: C

1614. What is the purpose of the “hybrid technology” in surge arresters?

- A. Hybrid technology accelerates follow current.
- B. Hybrid technology has no impact on performance.
- C. Hybrid technology combines different protection methods to enhance overall surge protection.
- D. Hybrid technology determines the sparkover voltage.

Answer: C

1615. How does the “short-circuit withstand capability” feature contribute to the reliability of surge arresters?

- A. Short-circuit withstand capability determines the sparkover voltage.
- B. Short-circuit withstand capability has no impact on reliability.
- C. Short-circuit withstand capability enhances the arrester’s ability to withstand short-circuit currents.
- D. Short-circuit withstand capability measures the follow current magnitude.

Answer: C

1616. What is the significance of the “ambient temperature range” specification in surge arresters?

- A. Ambient temperature range determines the sparkover voltage.
- B. Ambient temperature range has no impact on performance.
- C. Ambient temperature range specifies the range of temperatures within which the arrester can operate effectively.
- D. Ambient temperature range measures the energy handling capability.

Answer: C

1617. How does the “failure mode” specification in surge arresters impact their overall safety?

- A. Failure mode has no impact on safety.
- B. Failure mode determines the sparkover voltage.
- C. Failure mode specifies how the arrester behaves in the event of failure, ensuring safety.
- D. Failure mode measures the follow current magnitude.

Answer: C

1618. What is the role of the “self-healing capability” feature in surge arresters?

- A. Self-healing capability accelerates follow current.
- B. Self-healing capability has no impact on performance.
- C. Self-healing capability allows the arrester to recover from partial failures and maintain

functionality.

D. Self-healing capability determines the sparkover voltage.

Answer: C

1619. How does the “frequency range” specification in surge arresters impact their compatibility with different electrical systems?

A. Frequency range determines the sparkover voltage.

B. Frequency range has no impact on compatibility.

C. Frequency range specifies the range of frequencies within which the arrester can operate effectively.

D. Frequency range measures the follow current magnitude.

Answer: C

1620. How does the “self-extinguishing casing” feature in surge arresters contribute to safety?

A. Self-extinguishing casing determines the sparkover voltage.

B. Self-extinguishing casing has no impact on safety.

C. Self-extinguishing casing prevents the spread of fire by extinguishing itself, enhancing safety.

D. Self-extinguishing casing measures the energy handling capability.

Answer: C

1621. What role does the “grounding system compatibility” specification play in surge arresters?

A. Grounding system compatibility determines the sparkover voltage.

B. Grounding system compatibility has no impact on performance.

C. Grounding system compatibility ensures the arrester is suitable for different grounding configurations.

D. Grounding system compatibility measures the follow current magnitude.

Answer: C

1622. How does the “mounting accessories” specification impact the installation of surge arresters?

A. Mounting accessories determine the sparkover voltage.

B. Mounting accessories have no impact on installation.

C. Mounting accessories provide options and support for secure and efficient arrester installation.

D. Mounting accessories measure the energy handling capability.

Answer: C

1623. What is the significance of the “resistance to environmental conditions” feature in surge arresters?

A. Resistance to environmental conditions determines the sparkover voltage.

B. Resistance to environmental conditions has no impact on performance.

C. Resistance to environmental conditions ensures the arrester can withstand harsh weather and environmental factors.

D. Resistance to environmental conditions measures the follow current magnitude.

Answer: C

1624. How does the “magnetic-free construction” feature in surge arresters impact their interference with nearby equipment?

- A. Magnetic-free construction determines the sparkover voltage.
- B. Magnetic-free construction has no impact on interference.
- C. Magnetic-free construction minimizes magnetic interference with nearby equipment.
- D. Magnetic-free construction measures the energy handling capability.

Answer: C

1625. What role does the “shielded design” feature play in surge arresters?

- A. Shielded design determines the sparkover voltage.
- B. Shielded design has no impact on performance.
- C. Shielded design reduces electromagnetic radiation, enhancing safety and minimizing interference.
- D. Shielded design measures the follow current magnitude.

Answer: C

1626. How does the “humidity resistance” specification impact the performance of surge arresters in humid environments?

- A. Humidity resistance determines the sparkover voltage.
- B. Humidity resistance has no impact on performance.
- C. Humidity resistance ensures that the arrester maintains optimal performance in humid conditions.
- D. Humidity resistance measures the energy handling capability.

Answer: C

1627. What is the purpose of the “integrated disconnect device” in surge arresters?

- A. Integrated disconnect device determines the sparkover voltage.
- B. Integrated disconnect device has no impact on performance.
- C. Integrated disconnect device allows for the isolation of the arrester for maintenance or replacement.
- D. Integrated disconnect device measures the follow current magnitude.

Answer: C

1628. How does the “reliable triggering mechanism” in surge arresters enhance their responsiveness to surges?

- A. Reliable triggering mechanism determines the sparkover voltage.
- B. Reliable triggering mechanism has no impact on responsiveness.
- C. Reliable triggering mechanism ensures a quick and consistent response to surges.
- D. Reliable triggering mechanism measures the energy handling capability.

Answer: C

1629. What role does the “convenient visual indication” feature play in surge arresters?

- A. Convenient visual indication determines the sparkover voltage.
- B. Convenient visual indication has no impact on performance.
- C. Convenient visual indication provides an easy and clear way to assess the arrester’s

operational status.

D. Convenient visual indication measures the follow current magnitude.

Answer: C

1630. How does the “extended lifespan design” feature in surge arresters contribute to their durability?

A. Extended lifespan design determines the sparkover voltage.

B. Extended lifespan design has no impact on durability.

C. Extended lifespan design incorporates materials and technologies to prolong the arrester’s life.

D. Extended lifespan design measures the energy handling capability.

Answer: C

1631. What role does the “compact form factor” play in the installation of surge arresters in confined spaces?

A. Compact form factor determines the sparkover voltage.

B. Compact form factor has no impact on installation.

C. Compact form factor facilitates installation in confined spaces by requiring less physical space.

D. Compact form factor measures the follow current magnitude.

Answer: C

1632. How does the “wide operating temperature range” specification in surge arresters impact their performance in diverse environments?

A. Wide operating temperature range determines the sparkover voltage.

B. Wide operating temperature range has no impact on performance.

C. Wide operating temperature range ensures the arrester performs reliably across a broad range of temperatures.

D. Wide operating temperature range measures the energy handling capability.

Answer: C

1633. What is the significance of the “fail-safe design” in surge arresters?

A. Fail-safe design determines the sparkover voltage.

B. Fail-safe design has no impact on safety.

C. Fail-safe design minimizes the risk of catastrophic failure and ensures safe operation.

D. Fail-safe design measures the energy handling capability.

Answer: C

1634. How does the “quick response time” feature in surge arresters contribute to their effectiveness?

A. Quick response time determines the sparkover voltage.

B. Quick response time has no impact on effectiveness.

C. Quick response time ensures a rapid reaction to surges, providing swift protection to connected equipment.

D. Quick response time measures the follow current magnitude.

Answer: C

1635. What role does the “conformal coating” feature play in surge arresters?

- A. Conformal coating determines the sparkover voltage.
- B. Conformal coating has no impact on performance.
- C. Conformal coating protects internal components from environmental factors, enhancing durability.
- D. Conformal coating measures the energy handling capability.

Answer: C

1636. How does the “smart grid compatibility” specification in surge arresters impact their integration into modern power systems?

- A. Smart grid compatibility determines the sparkover voltage.
- B. Smart grid compatibility has no impact on integration.
- C. Smart grid compatibility ensures seamless integration with modern power systems, supporting advanced grid technologies.
- D. Smart grid compatibility measures the follow current magnitude.

Answer: C

1637. What is the purpose of the “UV resistance” feature in surge arresters?

- A. UV resistance determines the sparkover voltage.
- B. UV resistance has no impact on performance.
- C. UV resistance protects the arrester from the harmful effects of ultraviolet radiation, maintaining its structural integrity.
- D. UV resistance measures the energy handling capability.

Answer: C

1638. How does the “single-pulse energy rating” specification in surge arresters provide information about their energy-handling capability?

- A. Single-pulse energy rating determines the sparkover voltage.
- B. Single-pulse energy rating has no impact on energy handling capability.
- C. Single-pulse energy rating quantifies the arrester’s ability to handle a single surge event, indicating its energy-handling capability.
- D. Single-pulse energy rating measures the follow current magnitude.

Answer: C

1639. What role does the “distributed design” feature play in surge arresters?

- A. Distributed design determines the sparkover voltage.
- B. Distributed design has no impact on functionality.
- C. Distributed design allows for multiple protection points, enhancing the overall surge protection coverage.
- D. Distributed design measures the follow current magnitude.

Answer: C

1640. How does the “non-linear voltage-current characteristic” in surge arresters contribute to their protective function?

- A. Non-linear voltage-current characteristic determines the sparkover voltage.
- B. Non-linear voltage-current characteristic has no impact on protection.
- C. Non-linear voltage-current characteristic allows the arrester to respond rapidly to

voltage surges, providing effective protection.

D. Non-linear voltage-current characteristic measures the energy handling capability.

Answer: C

1641. What role does the “fail-open design” play in the safety of surge arresters?

A. Fail-open design determines the sparkover voltage.

B. Fail-open design has no impact on safety.

C. Fail-open design ensures that the arrester remains operational even in the event of a failure, contributing to safety.

D. Fail-open design measures the energy handling capability.

Answer: C

1642. How does the “predictive maintenance features” in surge arresters enhance their overall reliability?

A. Predictive maintenance features determine the sparkover voltage.

B. Predictive maintenance features have no impact on reliability.

C. Predictive maintenance features use advanced monitoring to anticipate potential issues, enhancing overall reliability.

D. Predictive maintenance features measure the follow current magnitude.

Answer: C

1643. What is the significance of the “low residual voltage” specification in surge arresters?

A. Low residual voltage determines the sparkover voltage.

B. Low residual voltage has no impact on performance.

C. Low residual voltage indicates the minimal voltage that remains after surge diversion, enhancing protection.

D. Low residual voltage measures the energy handling capability.

Answer: C

1644. How does the “high discharge capacity” feature in surge arresters contribute to their effectiveness?

A. High discharge capacity determines the sparkover voltage.

B. High discharge capacity has no impact on effectiveness.

C. High discharge capacity allows the arrester to handle large amounts of surge energy, ensuring effective protection.

D. High discharge capacity measures the follow current magnitude.

Answer: C

1645. What role does the “frequency response” specification play in the compatibility of surge arresters with different electrical systems?

A. Frequency response determines the sparkover voltage.

B. Frequency response has no impact on compatibility.

C. Frequency response specifies the range of frequencies to which the arrester can respond, ensuring compatibility with diverse electrical systems.

D. Frequency response measures the energy handling capability.

Answer: C

1646. How does the “multi-stage protection” feature in surge arresters enhance their capability to safeguard sensitive equipment?

- A. Multi-stage protection determines the sparkover voltage.
- B. Multi-stage protection has no impact on capability.
- C. Multi-stage protection provides layered defense, safeguarding sensitive equipment against different types of surges.
- D. Multi-stage protection measures the follow current magnitude.

Answer: C

1647. What is the purpose of the “low let-through energy” specification in surge arresters?

- A. Low let-through energy determines the sparkover voltage.
- B. Low let-through energy has no impact on performance.
- C. Low let-through energy indicates the minimal energy that passes through the arrester, reducing the impact on connected equipment.
- D. Low let-through energy measures the energy handling capability.

Answer: C

1648. How does the “automatic self-test capability” in surge arresters contribute to their reliability?

- A. Automatic self-test capability determines the sparkover voltage.
- B. Automatic self-test capability has no impact on reliability.
- C. Automatic self-test capability allows the arrester to perform regular self-tests, ensuring ongoing reliability.
- D. Automatic self-test capability measures the follow current magnitude.

Answer: C

1649. What role does the “easy maintenance access” feature play in surge arresters?

- A. Easy maintenance access determines the sparkover voltage.
- B. Easy maintenance access has no impact on maintenance.
- C. Easy maintenance access provides convenient access to internal components, facilitating straightforward maintenance.
- D. Easy maintenance access measures the energy handling capability.

Answer: C

1650. How does the “compact surge arrester design” contribute to its versatility in installation?

- A. Compact design determines the sparkover voltage.
- B. Compact design has no impact on versatility.
- C. Compact design allows for flexible installation in various spaces, enhancing versatility.
- D. Compact design measures the energy handling capability.

Answer: C

1651. What role does the “follow current capability” specification play in assessing surge arrester performance?

- A. Follow current capability determines the sparkover voltage.
- B. Follow current capability has no impact on performance.

C. Follow current capability indicates the arrester's ability to handle residual currents, assessing its performance.

D. Follow current capability measures the energy handling capability.

Answer: C

1652. How does the “adaptive triggering technology” in surge arresters enhance their responsiveness?

A. Adaptive triggering technology determines the sparkover voltage.

B. Adaptive triggering technology has no impact on responsiveness.

C. Adaptive triggering technology adjusts the arrester's response based on the surge characteristics, enhancing responsiveness.

D. Adaptive triggering technology measures the follow current magnitude.

Answer: C

1653. What is the significance of the “continuous monitoring capability” in surge arresters?

A. Continuous monitoring capability determines the sparkover voltage.

B. Continuous monitoring capability has no impact on capability.

C. Continuous monitoring capability allows for ongoing surveillance of the arrester's status, ensuring optimal performance.

D. Continuous monitoring capability measures the energy handling capability.

Answer: C

1654. How does the “corrosion-resistant materials” feature in surge arresters impact their longevity?

A. Corrosion-resistant materials determine the sparkover voltage.

B. Corrosion-resistant materials have no impact on longevity.

C. Corrosion-resistant materials protect the arrester from corrosion, enhancing longevity and durability.

D. Corrosion-resistant materials measure the follow current magnitude.

Answer: C

1655. What role does the “remote monitoring capability” play in the management of surge arresters?

A. Remote monitoring capability determines the sparkover voltage.

B. Remote monitoring capability has no impact on management.

C. Remote monitoring capability enables users to monitor and manage surge arresters from a distance, enhancing efficiency in management.

D. Remote monitoring capability measures the energy handling capability.

Answer: C

1656. How does the “modular design” feature contribute to the adaptability of surge arresters?

A. Modular design determines the sparkover voltage.

B. Modular design has no impact on adaptability.

C. Modular design allows for the addition or removal of modules, enhancing adaptability

to changing requirements.

D. Modular design measures the energy handling capability.

Answer: C

1657. What is the significance of the “integrated surge counter” in surge arresters?

A. Integrated surge counter determines the sparkover voltage.

B. Integrated surge counter has no impact on performance.

C. Integrated surge counter counts and records the number of surges the arrester has experienced, aiding in maintenance decisions.

D. Integrated surge counter measures the energy handling capability.

Answer: C

1658. How does the “thermal protection feature” in surge arresters contribute to their safety?

A. Thermal protection feature determines the sparkover voltage.

B. Thermal protection feature has no impact on safety.

C. Thermal protection feature prevents overheating, enhancing safety by protecting the arrester from thermal damage.

D. Thermal protection feature measures the follow current magnitude.

Answer: C

1659. What role does the “high surge current capacity” specification play in assessing surge arrester capabilities?

A. High surge current capacity determines the sparkover voltage.

B. High surge current capacity has no impact on capabilities.

C. High surge current capacity indicates the arrester’s ability to handle high levels of surge current, assessing its capabilities.

D. High surge current capacity measures the energy handling capability.

Answer: C

1660. “The mass of an ion liberated at an electrode is directly proportional to the quantity of electricity”.The above statement is associated with

A. Newton’s law

B. Faraday’s law of electromagnetic

C. Faraday’s law of electrolysis

D. Gauss’s law

Answer: C

1661. The charge required to liberate one gram equivalent of any substance is known as _____ constant

A. time

B. Faraday’s

C. Boltzman

D. Gauss’s

Answer: B

1662. During the charging of a lead-acid cell

- A. its voltage increases
- B. it gives out energy
- C. its cathode becomes dark chocolate brown in colour
- D. specific gravity of H_2SO_4 decreases

Answer: A

1663. The capacity of a lead-acid cell does not depend on its

- A. temperature
- B. rate of charge
- C. rate of discharge
- D. quantity of active material

Answer: B

1664. During charging the specific gravity of the electrolyte of a lead-acid battery

- A. increases
- B. decreases
- C. remains the same
- D. becomes zero

Answer: A

1665. The active materials on the positive and negative plates of a fully charged lead-acid battery are

- A. lead and lead peroxide
- B. lead sulphate and lead
- C. lead peroxide and lead
- D. none of the above

Answer: C

1666. When a lead-acid battery is in fully charged condition, the color of its positive plate is

- A. dark grey
- B. brown
- C. dark brown
- D. none of above

Answer: C

1667. The active materials of a nickel-iron battery are

- A. nickel hydroxide
- B. powdered iron and its oxide
- C. 21% solution of KOH
- D. all of the above

Answer: D

1668. The ratio of ampere-hour efficiency to watt-hour efficiency of a lead-acid cell is

- A. just one
- B. always greater than one
- C. always less than one
- D. none of the above.

Answer: B

- 1669. The best indication about the state of charge on a lead-acid battery is given by**
A. output voltage
B. temperature of electrolyte
C. specific gravity of electrolyte
D. none of the above

Answer: C

- 1670. The storage battery generally used in electric power station is**
A. nickel-cadmium battery
B. zinc-carbon battery
C. lead-acid battery
D. none of the above

Answer: C

- 1671. The output voltage of a charger is**
A. less than the battery voltage
B. higher than the battery voltage
C. the same as the battery voltage
D. none of the above

Answer: B

- 1672. Cells are connected in series in order to**
A. increase the voltage rating
B. increase the current rating
C. increase the life of the cells
D. none of the above

Answer: A

- 1673. Five 2 V cells are connected in parallel. The output voltage is**
A. 1 V
B. 1.5 V
C. 1.75 V
D. 2 V

Answer: D

- 1674. The capacity of a battery is expressed in terms of**
A. current rating
B. voltage rating
C. ampere-hour rating
D. none of the above

Answer: C

- 1675. During the charging and discharging of a nickel-iron cell**
A. corrosive fumes are produced
B. water is neither formed nor absorbed
C. nickel hydroxide remains unsplit
D. its e.m.f. remains constant

Answer: B

1676. As compared to constant-current system, the constant-voltage system of charging a lead acid cell has the advantage of

- A. reducing time of charging
- B. increasing cell capacity
- C. both A and B
- D. avoiding excessive gassing

Answer: C

1677. A dead storage battery can be revived by

- A. adding distilled water
- B. adding so-called battery restorer
- C. a dose of H_2SO_4
- D. none of the above

Answer: D

1678. As compared to a lead-acid cell, the efficiency of a nickel-iron cell is less due to its

- A. compactness
- B. lower e.m.f.
- C. small quantity of electrolyte used
- D. higher internal resistance

Answer: D

1679. Trickle charging of a storage battery helps to

- A. maintain proper electrolyte level
- B. increase its reserve capacity
- C. prevent sulphation
- D. keep it fresh and fully charged

Answer: D

1680. Those substances of the cell which take active part in chemical combination and hence produce electricity during charging or discharging are known as _____ materials.

- A. passive
- B. active
- C. redundant
- D. inert

Answer: B

1681. In a lead-acid cell dilute sulfuric acid (electrolyte) approximately comprises the following

- A. one part H_2O , three parts H_2SO_4
- B. two parts H_2O , two parts H_2SO_4
- C. three parts H_2O , one part H_2SO_4
- D. all H_2SO_4

Answer: C

1682. It is noticed that during charging

- A. there is a rise in voltage
- B. energy is absorbed by the cell
- C. specific gravity of H_2SO_4 is increased

D. all of the above

Answer: D

1683. It is noticed that during discharging the following does not happen

- A. both anode and cathode become PbSO_4
- B. specific gravity of H_2SO_4 decreases
- C. voltage of the cell decreases
- D. the cell absorbs energy

Answer: D

1684. The ampere-hour efficiency of a lead-acid cell is normally between

- A. 20 to 30%
- B. 40 to 50%
- C. 60 to 70%
- D. 90 to 95%

Answer: D

1685. The watt-hour efficiency of a lead-acid cell varies between

- A. 25 to 35%
- B. 40 to 60%
- C. 70 to 80%
- D. 90 to 95%

Answer: C

1686. The capacity of a lead-acid cell is measured in

- A. amperes
- B. ampere-hours
- C. watts
- D. watt-hours

Answer: B

1687. The capacity of a lead-acid cell depends on

- A. rate of discharge
- B. temperature
- C. density of electrolyte
- D. all above

Answer: D

1688. When the lead-acid cell is fully charged, the electrolyte assumes _____ appearance

- A. dull
- B. reddish
- C. bright
- D. milky

Answer: D

1689. The e.m.f. of an Edison cell, when fully charged, is nearly

- A. 1.4 V
- B. 1 V

C. 0.9 V

D. 0.8 V

Answer: A

1690. The internal resistance of an alkali cell is nearly _____ times that of the lead-acid cell.

A. two

B. three

C. four

D. five

Answer: D

1691. The average charging voltage for alkali cell is about

A. 1 V

B. 1.2 V

C. 1.7 V

D. 2.1 V

Answer: C

1692. On the average the ampere-hour efficiency of an Edison cell is about

A. 40%

B. 60%

C. 70%

D. 80%

Answer: D

1693. The active material of the positive plates of silver-zinc batteries is

A. silver oxide

B. lead oxide

C. lead

D. zinc powder

Answer: A

1694. Lead-acid cell has a life of nearly charges and discharges

A. 500

B. 700

C. 1000

D. 1250

Answer: D

1695. Life of the Edison cell is at least

A. five years

B. seven years

C. eight years

D. ten years

Answer: A

1696. The internal resistance of a lead-acid cell is that of Edison cell

- A. less than
- B. more than
- C. equal to
- D. none of the above

Answer: A

1697. Electrolyte used in an Edison cell is

- A. NaOH
- B. KOH
- C. HCl
- D. HNO₃

Answer: B

1698. Electrolyte used in a lead-acid cell is

- A. NaOH
- B. only H₂SO₄
- C. only water
- D. dilute H₂SO₄

Answer: D

1699. Negative plate of an Edison cell is made of

- A. copper
- B. lead
- C. iron
- D. silver oxide

Answer: C

1700. The open circuit voltage of any storage cell depends wholly upon

- A. its chemical constituents
- B. on the strength of its electrolyte
- C. its temperature
- D. all above

Answer: D

1701. The specific gravity of electrolyte is measured by

- A. manometer
- B. a mechanical gauge
- C. hydrometer
- D. psychrometer

Answer: C

1702. When the specific gravity of the electrolyte of a lead-acid cell is reduced to 1.1 to 1.15 the cell is in

- A. charged state
- B. discharged state
- C. both A. and B
- D. active state

Answer: B

1703. In _____ system the charging current is intermittently controlled at either a maximum or minimum value

- A. two rate charge control
- B. trickle charge
- C. floating charge
- D. an equalizing charge

Answer: A

1704. Over charging

- A. produces excessive gassing
- B. loosens the active material
- C. increases the temperature resulting in buckling of plates
- D. all above

Answer: D

1705. Undercharging

- A. reduces specific gravity of the electrolyte
- B. increases specific gravity of the electrolyte
- C. produces excessive gassing
- D. increases the temperature

Answer: A

1706. Internal short circuits are caused by

- A. breakdown of one or more separators
- B. excess accumulation of sediment at the bottom of the cell
- C. both A. and B
- D. none of the above

Answer: C

1707. The effect of sulphation is that the internal resistance

- A. increases
- B. decreases
- C. remains same
- D. none of the above

Answer: A

1708. Excessive formation of lead sulphate on the surface of the plates happens because of

- A. allowing a battery to stand in discharged condition for a long time
- B. topping up with electrolyte
- C. persistent undercharging
- D. low level of electrolyte
- E. all above

Answer: E

1709. The substances which combine together to store electrical energy during the charge are called _____ materials

- A. active
- B. passive
- C. inert
- D. dielectric

Answer: A

1710. In a lead-acid cell, lead is called as

- A. positive active material
- B. negative active material
- C. passive material
- D. none of the above

Answer: B

1711. The lead-acid cell should never be discharged beyond

- A. 1.8 V
- B. 1.9 V
- C. 2 V
- D. 2.1 V

Answer: A

1712. On overcharging a battery

- A. it will bring about chemical change in active materials
- B. it will increase the capacity of the battery
- C. it will raise the specific gravity of the electrolyte
- D. none of the above will occur

Answer: D

1713. Each cell has a vent cap

- A. to allow gases out when the cell is on charge
- B. to add water to the cell if needed
- C. to check the level of electrolyte
- D. to do all above functions

Answer: D

1714. Following will occur if level of electrolyte falls below plates

- A. capacity of the cell is reduced
- B. life of the cell is reduced
- C. open plates are converted to lead sulphate
- D. all above

Answer: D

1715. In constant voltage charging method, the charging current from discharged to fully charged condition

- A. decreases
- B. increases
- C. remains constant
- D. none of the above

Answer: A

1716. ampere-hour capacity would deliver a current of

- A. 48 amperes for 1 hour
- B. 24 amperes for 2 hours
- C. 8 amperes for 6 hours
- D. 6 amperes for 8 hours

Answer: D

1717. In constant-current charging method, the supply voltage from discharged to fully charged condition

- A. decreases
- B. increases
- C. remains constant
- D. none of the above

Answer: B

1718. Battery charging equipment is generally installed

- A. in well ventilated location
- B. in clean and dry place
- C. as near as practical to the battery being charged
- D. in location having all above features

Answer: D

1719. Following will happen if the specific gravity of electrolyte becomes more than 1.23.

- A. Loss of capacity
- B. Loss of life
- C. Corrosion of the grids of the plate
- D. All above

Answer: D

1720. Batteries are charged by

- A. rectifiers
- B. engine generator sets
- C. motor generator sets
- D. any one of the above methods

Answer: D

1721. Cell short circuit results in

- A. low sp. gravity electrolyte
- B. abnormal high temperature
- C. reduced gassing on charge
- D. all above

Answer: D

1722. Internal resistance of a cell is reduced by

- A. using vent plug to permit gas formed during discharge
- B. increasing the plate area
- C. putting plates very close together
- D. all above methods

Answer: D

1723. Capacity of dry cells is

- A. more when it is supplying current for intermittent periods
- B. more when it is supplying current for continuous periods
- C. unaffected by the type of discharge
- D. none of the above

Answer: A

1724. Battery container should be acid resistance, therefore it is made up of

- A. glass
- B. plastic
- C. wood
- D. all above

Answer: D

1725. Sulphated cells are indicated by

- A. the loss of capacity of the cell
- B. the decrease of the specific gravity
- C. the low voltage of the cell on discharge
- D. all above conditions

Answer: D

1726. In a lead-acid cell, if the specific gravity of sulphuric acid is 1.8, it will require following ratio of acid to water to get mixture of specific gravity of 1.3

- A. 6 parts of acid to 4 parts of water
- B. 4 parts of acid to 4 parts of water
- C. 4 parts of acid to 6 parts of water
- D. 4 parts of acid to 8 parts of water

Answer: C

1727. Local action in a battery is indicated by

- A. excessive gassing under load conditions
- B. excessive drop in the specific gravity of electrolyte even when the cell is on open circuit
- C. both A. and B
- D. none of the above

Answer: D

1728. Following will happen if battery charging rate is too high

- A. excessive gassing will occur
- B. temperature rise will occur
- C. bulging and buckling of plates will occur
- D. all above will occur

Answer: D

1729. Internal resistance of a cell is due to

- A. resistance of electrolyte
- B. electrode resistance
- C. surface contact resistance between electrode and electrolyte
- D. all above

Answer: D

1730. If a battery is wrongly connected on charge following will happen

- A. current delivered by the battery will be high
- B. current drawing will be nil
- C. current drawing will be very small
- D. current drawing will be very high

Answer: D

1731. In order that a hydrometer may float vertically in electrolyte its C.G. should be

- A. lowered
- B. raised
- C. undisturbed
- D. displaced sideways

Answer: A

1732. If a lead-acid cell is discharged below 1.8 V the following will happen.

- A. Capacity of cell will reduce
- B. Sulphation of plates will occur
- C. Internal resistance will increase
- D. All above will occur

Answer: D

1733. Life of the batteries is in the following ascending order.

- A. Lead-acid cell, Edison cell, Nickel cadmium cell
- B. Lead-acid cell, Nickel-cadmium cell, Edison cell
- C. Edison cell, Nickel-cadmium cell, lead-acid cell
- D. Nickel-cadmium cell, Edison cell, lead-acid cell

Answer: A

1734. Persons preparing electrolyte should wear

- A. goggles or other face shield
- B. rubber
- C. rubber boots and gloves
- D. all above safety devices

Answer: D

1735. Excessive charging a battery tends to

- A. produce gassing
- B. increase the internal resistance of the battery
- C. to corrode the positive plates into lead peroxide thereby weakening them physically
- D. bring about all above changes

Answer: D

1736. Shelf life of a small dry cell is

- A. equal to that of large dry cell
- B. less than that of large dry cell
- C. more than that of large dry cell
- D. none of the above

Answer: B

1737. The current flow through electrolyte is due to the movement of

- A. ions
- B. holes
- C. electrons
- D. none of the above

Answer: A

1738. Level of electrolyte in a cell should be _____ the level of plates

- A. below
- B. equal to
- C. above
- D. none of the above

Answer: C

1739. During discharge, the active material of both the positive and negative plates is changed to

- A. Pb
- B. PbO₂
- C. PbO
- D. PbSO₄

Answer: D

1740. _____ of electrolyte indicates the state of charge of the battery

- A. colour
- B. mass
- C. viscosity
- D. specific gravity

Answer: D

1741. The following indicate that battery on charge has attained full charge

- A. colour of electrode
- B. gassing
- C. specific gravity
- D. all above

Answer: D

1742. Dry cell is modification of

- A. Daniell cell
- B. Leclanche cell
- C. Lead-acid cell
- D. Edison cell

Answer: B

1743. Capacity of a battery is expressed in

- A. Ah
- B. Vh
- C. Wh
- D. kWh

Answer: A

1744. In alkaline cell the electrolyte is

- A. dilute sulphuric acid
- B. concentrated sulphuric acid
- C. NaOH
- D. KOH

Answer: D

1745. Self charge of a Ni-Fe cell is _____ Edison cell.

- A. equal to
- B. less than
- C. more than
- D. much more than

Answer: B

1746. Ampere hour capacity of an industrial battery is based on ____ hours discharge rate.

- A. 8
- B. 12
- C. 16
- D. 24

Answer: A

1747. The body of Edison cell is made of

- A. bakelite
- B. rubber
- C. nickel plated steel
- D. aluminium

Answer: C

1748. Specific gravity of electrolyte in Edison cell is

- A. 0.8
- B. 0.95
- C. 1.1
- D. 1.21

Answer: D

1749. All the electrical connections between the battery and vehicle should be by

- A. thin aluminium wires
- B. thin copper wires
- C. rigid cables
- D. flexible cables

Answer: D

1750. A battery of 6 cells will show a drop of ____ volts from fully charged state to fully discharged state.

- A. 1.0
- B. 1.5
- C. 2.4
- D. 2.9

Answer: C

1751. During the idle period of the battery, strong electrolyte tends to change the active material of the cell into

- A. PbO_2
- B. $PbSO_4$
- C. PbO
- D. Pb

Answer: B

1752. Charging of sulphated battery produces ____ heat.

- A. no
- B. very little
- C. less
- D. more

Answer: D

1753. Hydrogen evolved during charging produces explosive mixture when it is more than

- A. 2%
- B. 4%
- C. 6%
- D. 8%

Answer: D

1754. Weston standard cell at 20°C has voltage of ____ volts.

- A. 0.8
- B. 0.9
- C. 1.0187
- D. 1.5

Answer: C

1755. Extent of corrosion in the underground metal work depends upon

- A. amount of moisture
- B. type of metals
- C. type of soil chemicals
- D. all above factors

Answer: D

1756. Mercury cell has which of the following characteristics ?

- A. Flat discharge current-voltage curve
- B. High power to weight ratio
- C. Comparatively longer shelf life under adverse conditions of high temperature and humidity
- D. All of the above

Answer: D

1757. Charging a sulphated battery at high rate results in

- A. boiling of electrolyte due to gassing
- B. warping of plates
- C. damage to separators, cell caps covers and battery case due to excessive temperature
- D. all above

Answer: D

1758. Short circuiting of a cell may be caused

- A. buckling of plates
- B. faulty separators
- C. lead particles forming circuit between positive and negative plates
- D. All of the above

Answer: D

1759. In a battery cover is placed over the element and sealed to the top of the battery container. This is done

- A. to reduce evaporation of water from electrolyte
- B. to exclude dirt and foreign matter from the electrolyte
- C. to discharge both of the above functions
- D. to discharge none of the above functions

Answer: C

1760. For a cell to work, which of the following condition(s) become necessary ?

- A. Two electrodes of different meta's should be inserted in the electrolyte, not touching each other
- B. Electrolyte must chemically react with one of the electrodes
- C. Electrolyte liquid or paste should be conducting
- D. All above three conditions are necessary

Answer: D

1761. Which of the following primary cells has the lowest voltage ?

- A. Lithium
- B. Zinc-chloride
- C. Mercury
- D. Carbon-zinc

Answer: C

1762. Which of the following primary cells has the highest voltage ?

- A. Manganese-alkaline
- B. Carbon-zinc
- C. Lithium
- D. Mercury

Answer: C

1763. While preparing electrolyte for a lead-acid battery

- A. water is poured into acid
- B. acid is poured into water
- C. anyone of the two can be added to other chemical

Answer: B

1764. Which of the following battery is used for air-craft ?

- A. Lead-acid battery
- B. Nickel-iron battery
- C. Dry cell battery
- D. Silver oxide battery

Answer: B

1765. Which of the following cell has a reversible chemical reaction ?

- A. Lead-acid
- B. Mercury oxide
- C. Carbon-zinc
- D. Silver-oxide

Answer: A

1766. Which of the following is incorrect ?

- A. A storage cell has a reversible chemical reaction
- B. A lead-acid cell can be recharged
- C. A carbon-zinc cell has unlimited shelf life
- D. A primary cell has an irreversible chemical reaction

Answer: C

1767. Which of the following has lower sp. gravity V

- A. Dilute H_2SO_4
- B. Concentrated H_2SO_4
- C. Water
- D. Any of the above

Answer: C

1768. Under normal charging rate, the charging current should be

- A. 10% of capacity
- B. 20% of capacity
- C. 30% of capacity
- D. 40% of capacity

Answer: A

1769. When two batteries are connected in parallel, it should be ensured that

- A. they have same e.m.f.
- B. they have same make
- C. they have same ampere-hour capacity
- D. they have identical internal resistance

Answer: A

1770. A typical output of a solar cell is

- A. 0.1V
- B. 0.26 V
- C. 1.1 V
- D. 2 V

Answer: B

1771. Petroleum jelly is applied to the electrical connections to the lead-acid battery

- A. prevent local heating
- B. prevent short-circuiting
- C. reduce path resistance
- D. prevent corrosion

Answer: D

1772. When the load resistance equals the generator resistance which of the following will be maximum ?

- A. Current
- B. Efficiency of the circuit
- C. Power in the load resistance
- D. Voltage across the load resistance

Answer: C

1773. The common impurity in the electrolyte of lead-acid battery is

- A. chlorine
- B. dust particles
- C. lead crystals
- D. iron

Answer: D

1774. In a lead-acid battery the energy is stored in the form of

- A. charged ions
- B. chemical energy
- C. electrostatic energy
- D. electromagnetic energy

Answer: B

1775. Which among the following constitutes the major load for an automobile battery ?

- A. Brake light
- B. Self starter
- C. Parking lights
- D. Spark plugs

Answer: B

1776. Which of the following factors adversely affects the capacity of the lead acid battery ?

- A. Temperature of surroundings
- B. Specific gravity of electrolyte
- C. Rate of discharge
- D. All of the above

Answer: D

1777. Cells are connected in parallel to

- A. increase the efficiency
- B. increase the current capacity
- C. increase the voltage output
- D. increase the internal resistance

Answer: B

1778. A constant-voltage generator has

- A. minimum efficiency
- B. minimum current capacity
- C. low internal resistance
- D. high internal resistance

Answer: C

1779. Satellite power requirement is provided through

- A. solar cells
- B. dry cells
- C. nickel-cadmium cells
- D. lead-acid batteries

Answer: A

1780. What is the primary function of a fuse in an electrical circuit?

- A. To interrupt the flow of current when it exceeds a predetermined safe limit.
- B. To control the voltage level in the circuit.
- C. To act as a heat sink for the electrical components.
- D. To provide a connection point for multiple wires.

Answer: A

1781. Which material is commonly used in a fuse element due to its low melting point and high resistance?

- A. Copper
- B. Tin
- C. Aluminum
- D. Steel

Answer: B

1782. What factors influence the current rating of a fuse?

- A. Length and diameter of the element
- B. Both A and C
- C. Material composition of the element
- D. Voltage level of the circuit

Answer: B

1783. Which type of fuse is designed for quick response and precise tripping at specific current levels?

- A. Time-delay fuse
- B. Fast-acting fuse
- C. Cartridge fuse
- D. Resettable fuse

Answer: B

1784. What is the advantage of a cartridge fuse over a traditional glass fuse?

- A. Increased voltage rating
- B. Enhanced safety due to enclosed construction
- C. Easier visual inspection of the element
- D. Lower cost and wider availability

Answer: B

1785. What can cause a fuse to blow prematurely, even at normal current levels?

- A. Excessive ambient temperature
- B. Both A and C
- C. Loose connections or corrosion on the fuse holder
- D. Overtightening of the fuse in the holder

Answer: B

1786. What should you NEVER do after a fuse blows in an electrical circuit?

- A. Disconnect the power supply immediately.
- B. Check for the cause of the overload before replacing the fuse.
- C. Attempt to reset or bypass the fuse.
- D. Replace the fuse with a higher-rated one to prevent future blowouts.

Answer: C

1787. Which type of fuse is suitable for household applications due to its affordability and ease of replacement?

- A. High-voltage fuse
- B. Automotive fuse
- C. Liquid-filled fuse
- D. Plug fuse

Answer: D

1788. What is the purpose of a time-delay fuse in a motor circuit?

- A. Precise tripping under short-circuit conditions.
- B. Controlled response to accommodate motor starting current surges.
- C. Increased protection against voltage spikes.
- D. Faster reaction to protect sensitive electronics.

Answer: B

1789. What does the “interrupting rating” of a fuse indicate?

- A. Maximum voltage it can withstand.
- B. Maximum fault current it can safely interrupt.
- C. Operating temperature range of the element.
- D. Current rating under normal operating conditions.

Answer: B

1790. What is the main disadvantage of using resettable fuses compared to traditional fuses?

- A. Higher cost and limited availability.
- B. Slower response time and potential for overheating.
- C. Increased risk of electrical shock due to exposed elements.
- D. Difficulty in visually identifying a blown state.

Answer: B

1791. How can you differentiate between a blown cartridge fuse and a good one without removing it from the holder?

- A. By visually inspecting the element through the transparent window (if available).
- B. Using a continuity tester to check for an open circuit across the fuse.
- C. Measuring the voltage drop across the fuse while the circuit is energized.
- D. Shaking the holder to listen for rattling sound from the element.

Answer: B

1792. What type of fuse is commonly used in automotive applications due to its compact size and vibration resistance?

- A. Blade fuse
- B. Microfuse
- C. High-rupture capacity fuse
- D. Time-lag fuse

Answer: B

1793. What safety precautions should you take when replacing a blown fuse?

- A. Wear insulated gloves and safety glasses.
- B. Always work on a de-energized circuit.
- C. Use a screwdriver or pliers to grip the fuse firmly.
- D. Replace the fuse with one of the same rating and type.

Answer: B

1794. Which statement is TRUE about arc quenching in high-voltage fuses?

- A. It is not necessary for low-voltage applications.
- B. It involves using special materials or chambers to rapidly extinguish the arc formed during overload.
- C. It can be achieved by increasing the air gap between the fuse element and the contacts.
- D. Arc quenching has no impact on the overall safety of the fuse.

Answer: B

1795. What is the primary function of a fuse indicator in a cartridge fuse?

- A. Provide visual confirmation of a blown fuse.
- B. Increase the interrupting rating of the fuse.
- C. Act as a heat sink for the element.
- D. Measure the current flowing through the circuit.

Answer: A

1796. How does a liquid-filled fuse operate differently from a traditional solid-type fuse?

- A. It uses a magnetic field to interrupt the current.
- B. The liquid expands and extinguishes the arc when overloaded.
- C. It has a higher voltage rating due to the insulating properties of the liquid.
- D. It provides slower response time for motor circuit protection.

Answer: B

1797. What potential hazard can arise from using an oversized fuse in a circuit?

- A. Increased risk of overheating and fire.
- B. Reduced protection against short circuits.
- C. Difficulty in fitting the fuse into the holder.
- D. Improved circuit efficiency due to lower resistance.

Answer: A

1798. What is the purpose of a ferrule (crimp cap) on the end of a fuse wire?

- A. Enhance electrical conductivity.
- B. Secure the wire connection to the fuse holder.
- C. Act as an additional safety barrier against shock hazards.
- D. Increase the melting point of the fuse element.

Answer: B

1799. What type of fuse is best suited for protecting sensitive electronic equipment due to its fast response and low fault current interruption capability?

- A. High-rupture capacity fuse.
- B. Time-delay fuse.
- C. Semiconductor fuse.
- D. Cartridge fuse.

Answer: C

1800. Which statement accurately describes the relationship between fuse rating and ambient temperature?

- A. The higher the ambient temperature, the lower the safe current rating for the fuse.
- B. Ambient temperature doesn't affect the fuse rating as long as it's within operating limits.
- C. A lower ambient temperature allows for a higher-rated fuse to be used in the circuit.
- D. The current rating of a fuse remains constant regardless of the surrounding temperature.

Answer: A

1801. What potential drawback exists when using high-rupture capacity HRC. fuses?

- A. They are susceptible to damage from vibration and shock.
- B. They require specialized holders due to their larger size.
- C. Their fast-acting nature may not offer sufficient protection for motor circuits.
- D. They are generally less efficient and generate more heat compared to standard fuses.

Answer: B

1802. What is the primary function of a current-limiting fuse in protecting electrical equipment?

- A. To rapidly extinguish the arc formed during overload.
- B. To limit the peak current level during a fault event, minimizing damage.
- C. To provide overload protection with a longer time delay for motor starting surges.
- D. To act as a voltage regulator and stabilize the circuit.

Answer: B

1803. What type of fuse is commonly used in residential and commercial power distribution panels?

- A. Blade fuse.
- B. Bolt-on fuse.
- C. Microfuse.
- D. Cartridge fuse.

Answer: B

1804. What safety precautions should be taken when handling and storing spare fuses?

- A. Ensure they are properly labeled and stored in a cool, dry place.
- B. Test them with a continuity tester before use to verify functionality.
- C. Keep them close to electrical panels for easy access in case of a blown fuse.
- D. Dispose of used fuses immediately to avoid accidental misuse.

Answer: A

1805. How does the cross-sectional area of a fuse element affect its current rating?

- A. A larger area allows for higher current flow before melting.
- B. A smaller area provides faster response times to overcurrents.
- C. The cross-sectional area has no significant impact on the fuse rating.
- D. A larger area increases the overall resistance of the element.

Answer: A

1806. What is the main advantage of using a refill fuse compared to a disposable cartridge fuse?

- A. Easier visual inspection of the element for blown status.
- B. Reduced cost and environmental impact due to reusable components.
- C. Improved safety with enclosed construction and arc quenching mechanisms.
- D. Faster tripping times and higher interrupting rating.

Answer: B

1807. What potential risks are associated with using improper or counterfeit fuses?

- A. Reduced protection against overcurrents and increased fire hazards.
- B. Improved circuit efficiency due to lower resistance.
- C. Enhanced compatibility with different types of fuse holders.
- D. Extended lifespan and greater durability compared to genuine fuses.

Answer: A

1808. What can be used as a temporary alternative to a blown fuse if no appropriate replacement is available immediately?

- A. A higher-rated fuse to prevent future blowouts.
- B. A piece of wire or foil, which is highly dangerous and should be avoided.
- C. A resettable fuse, if compatible with the circuit and current requirements.
- D. Another fuse from a different circuit, even if with different rating.

Answer: B

1809. What is the importance of proper fuse selection and installation in electrical systems?

- A. Ensuring optimal circuit protection against overcurrents and potential damage.
- B. Matching the aesthetic appearance of the fuse holder for design consistency.
- C. Simplifying future replacement by using any readily available fuse.
- D. Reducing the overall cost of the electrical installation by choosing inexpensive fuses.

Answer: A

1810. How does the diameter of a fuse element influence its melting point and current rating?

- A. A larger diameter increases the melting point and current rating.
- B. A smaller diameter offers faster response times but lower current capacity.
- C. The diameter has minimal impact on the element's performance.
- D. A larger diameter reduces the overall resistance of the fuse.

Answer: A

1811. What material property is crucial for maintaining a fast-acting response time in a fuse element?

- A. Low specific heat capacity
- B. High electrical conductivity
- C. Ductility and malleability
- D. Resistance to corrosion

Answer: A

1812. What type of fuse is primarily used for protecting low-voltage circuits in sensitive electronic equipment?

- A. Nano-fuse
- B. Liquid-filled fuse
- C. Time-delay fuse
- D. HRC fuse

Answer: A

1813. What is the primary purpose of sand filling in some cartridge fuses?

- A. To enhance arc quenching capabilities during overload.
- B. To improve heat dissipation from the element.
- C. To provide additional mechanical support for the element.
- D. To increase the voltage rating of the fuse.

Answer: A

1814. What specialized type of fuse is used for protecting high-voltage power transmission lines?

- A. Expulsion fuse
- B. Semiconductor fuse
- C. Blade fuse
- D. Refill fuse

Answer: A

1815. What is the advantage of using a current-limiting fuse with semiconductor technology compared to traditional fuses?

- A. Faster response time and lower peak current during fault events.
- B. Reduced cost and compatibility with existing fuse holders.
- C. Ability to withstand higher voltages and larger fault currents.
- D. Improved arc quenching capabilities and visual indication of blown state.

Answer: A

1816. What type of fuse is recommended for protecting motor circuits due to its ability to handle starting current surges?

- A. Time-lag fuse
- B. Fast-acting fuse
- C. High-rupture capacity fuse
- D. Liquid-filled fuse

Answer: A

1817. What is the primary function of a fuse link in a high-voltage fuse?

- A. To provide mechanical support for the element and connect it to the terminals.
- B. To act as a heat sink and improve the element's cooling efficiency.
- C. To isolate the arc formed during overload and direct it safely away from the fuse body.
- D. To control the voltage drop across the circuit and regulate power flow.

Answer: A

1818. What potential consequences can occur if a fuse is underrated for the circuit it protects?

- A. Increased risk of overheating, fire hazards, and circuit damage.
- B. Improved efficiency and reduced power consumption due to lower resistance.
- C. Faster response time to protect sensitive electronics from overcurrents.
- D. Enhanced arc quenching capabilities and fault current interruption.

Answer: A

1819. What is the importance of properly labeling fuses with their current rating and type?

- A. Ensuring safe and efficient replacement by choosing the appropriate fuse.
- B. Enhancing the aesthetic appearance of the fuse holder and wiring system.

- C. Simplifying circuit troubleshooting by identifying potential fuse-related issues.
- D. Complying with building codes and electrical safety regulations.

Answer: A

1820. How can the ambient temperature surrounding a fuse affect its current rating?

- A. Higher temperatures require a lower current rating for safe operation.
- B. Lower temperatures allow for a higher current rating due to improved heat dissipation.
- C. Ambient temperature has no significant impact on the fuse rating.
- D. Higher temperatures enhance the element's melting point and increase the current capacity.

Answer: A

1821. What factor, apart from current rating, is crucial for choosing the right fuse for a specific application?

- A. Voltage rating of the circuit
- B. Type of wire used in the circuit
- C. Color code of the fuse element
- D. Size and dimensions of the fuse holder

Answer: A

1822. For high-voltage fuses, what material is commonly used due to its excellent insulating properties?

- A. Porcelain
- B. Copper
- C. Aluminum
- D. PVC

Answer: A

1823. Which type of fuse is well-suited for protecting automotive circuits due to its compact size and vibration resistance?

- A. Microfuse
- B. Cartridge fuse
- C. Bolt-on fuse
- D. Time-lag fuse

Answer: A

1824. What potential hazard can occur if a fuse holder is not properly tightened or secured?

- A. Increased risk of arcing and electrical shock due to loose connections.
- B. Faster response time and improved protection against overcurrents.
- C. Enhanced cooling efficiency and lower operating temperature for the fuse.
- D. Reduced voltage drop across the circuit and improved power transmission.

Answer: A

1825. What potential consequences can occur if a fuse is underrated for the circuit it protects?

- A. Increased risk of overheating, fire hazards, and circuit damage due to delayed tripping.
- B. Improved efficiency and reduced power consumption due to lower resistance.
- C. Faster response time to protect sensitive electronics from overcurrents.
- D. Enhanced arc quenching capabilities and safe interruption of even small fault currents.

Answer: A

1826. What is the primary function of a ferrule (crimp cap) on the end of a fuse wire?

- A. Secure the wire connection to the fuse holder.
- B. Enhance electrical conductivity.
- C. Act as an additional safety barrier against shock hazards.
- D. Increase the melting point of the fuse element.

Answer: A

1827. How does the cross-sectional area of a fuse element affect its current rating?

- A. A larger area allows for higher current flow before melting.
- B. A smaller area offers faster response times to overcurrents.
- C. The cross-sectional area has no significant impact on the fuse rating.
- D. A larger area increases the overall resistance of the element.

Answer: A

1828. What is the main advantage of using a refill fuse compared to a disposable cartridge fuse?

- A. Reduced cost and environmental impact due to reusable components.
- B. Easier visual inspection of the element for blown status.
- C. Improved safety with enclosed construction and arc quenching mechanisms.
- D. Faster tripping times and higher interrupting rating.

Answer: A

1829. What potential risks are associated with using improper or counterfeit fuses?

- A. Reduced protection against overcurrents and increased fire hazards.
- B. Improved circuit efficiency due to lower resistance.
- C. Enhanced compatibility with different types of fuse holders.
- D. Extended lifespan and greater durability compared to genuine fuses.

Answer: A

1830. What type of fuse is best suited for protecting power distribution panels in large buildings due to their high current capacity and robust construction?

- A. Bolt-on fuse
- B. Blade fuse
- C. Microfuse
- D. Cartridge fuse

Answer: A

1831. What is the primary purpose of sand filling in some high-voltage fuses?

- A. To improve heat dissipation from the element.
- B. To enhance arc quenching capabilities during overload.
- C. To provide additional mechanical support for the element.
- D. To increase the voltage rating of the fuse.

Answer: B

1832. How does the diameter of a fuse element influence its melting point and current rating?

- A. A larger diameter increases the melting point and current rating.
- B. A smaller diameter offers faster response times but lower current capacity.
- C. The diameter has minimal impact on the element's performance.
- D. A larger diameter reduces the overall resistance of the fuse.

Answer: A

1833. What material property is crucial for maintaining a fast-acting response time in a fuse element?

- A. Low specific heat capacity
- B. High electrical conductivity
- C. Ductility and malleability
- D. Resistance to corrosion

Answer: A

1834. What type of fuse is primarily used for protecting low-voltage circuits in sensitive electronic equipment?

- A. Nano-fuse
- B. Liquid-filled fuse
- C. Time-delay fuse
- D. HRC fuse

Answer: A

1835. What is the advantage of using a current-limiting fuse with semiconductor technology compared to traditional fuses?

- A. Faster response time and lower peak current during fault events.
- B. Reduced cost and compatibility with existing fuse holders.
- C. Ability to withstand higher voltages and larger fault currents.
- D. Improved arc quenching capabilities and visual indication of blown state.

Answer: A

1836. What type of fuse is recommended for protecting motor circuits due to its ability to handle starting current surges?

- A. Time-lag fuse
- B. Fast-acting fuse
- C. High-rupture capacity fuse
- D. Liquid-filled fuse

Answer: A

1837. What is the importance of properly labeling fuses with their current rating and type?

- A. Ensuring safe and efficient replacement by choosing the appropriate fuse.
- B. Enhancing the aesthetic appearance of the fuse holder and wiring system.
- C. Simplifying circuit troubleshooting by identifying potential fuse-related issues.
- D. Complying with building codes and electrical safety regulations.

Answer: A

1838. What potential consequences can occur if a fuse holder is not properly tightened or secured?

- A. Increased risk of arcing and electrical shock due to loose connections.
- B. Faster response time and improved protection against overcurrents.
- C. Enhanced cooling efficiency and lower operating temperature for the fuse.
- D. Reduced voltage drop across the circuit and improved power transmission.

Answer: A

1839. How can the ambient temperature surrounding a fuse affect its current rating?

- A. Higher temperatures require a lower current rating for safe operation.
- B. Lower temperatures allow for a higher current rating due to improved heat dissipation.
- C. Ambient temperature has no significant impact on the fuse rating.
- D. Higher temperatures enhance the element's melting point and increase the current capacity.

Answer: A

1840. What factor, apart from current rating, is crucial for choosing the right fuse for a specific application?

- A. Voltage rating of the circuit
- B. Type of wire used in the circuit
- C. Color code of the fuse element
- D. Size and dimensions of the fuse holder

Answer: A

1841. What material is commonly used in high-voltage fuses due to its excellent insulating properties?

- A. Porcelain
- B. Copper
- C. Aluminum
- D. PVC

Answer: A

1842. Which type of fuse is well-suited for protecting automotive circuits due to its compact size and vibration resistance?

- A. Microfuse
- B. Cartridge fuse
- C. Bolt-on fuse
- D. Time-lag fuse

Answer: A

1843. What is the primary function of a fuse indicator window on a cartridge fuse?

- A. Easier and safer identification of a blown fuse without removing the holder.
- B. Enhanced arc quenching capabilities and reduced fault current interruption.
- C. Improved current rating due to increased heat dissipation.
- D. More accurate measurement of the voltage drop across the circuit.

Answer: A

1844. What potential hazard can occur if a fuse is oversized for the circuit it protects?

- A. Higher risk of overheating, fire hazards, and circuit damage due to delayed tripping.
- B. Increased protection against short circuits and electrical surges.
- C. Faster response time and improved efficiency for sensitive electronic components.
- D. Enhanced arc quenching and safe interruption of even small fault currents.

Answer: A

1845. What type of fuse is primarily used in residential appliance circuits due to its affordability and ease of replacement?

- A. Blade fuse
- B. Microfuse
- C. Cartridge fuse
- D. High-rupture capacity fuse

Answer: A

1846. What characteristic makes a ceramic fuse element suitable for high-voltage applications?

- A. High melting point and excellent heat resistance
- B. Low specific heat capacity and fast response time
- C. Ductility and malleability for easy installation
- D. High electrical conductivity and reduced voltage drop

Answer: A

1847. What safety precautions should be taken when working with high-voltage fuses?

- A. Wear insulated gloves, safety glasses, and follow proper lockout/tagout procedures.
- B. Use a screwdriver or pliers to grip the fuse firmly for better leverage.
- C. Test the fuse with a continuity tester before handling it to verify functionality.

D. Replace the fuse with one of the same rating and type regardless of the circuit requirements.

Answer: A

1848. Which type of fuse is not recommended for motor circuits due to its fast-acting response time?

- A. Fast-acting fuse
- B. Time-lag fuse
- C. Liquid-filled fuse
- D. Cartridge fuse

Answer: A

1849. How can choosing the right fuse size and type enhance the operational efficiency of a circuit?

- A. Minimizes heat generation and power losses, improving overall energy efficiency.
- B. Allows for higher operating temperatures, leading to increased circuit capacity.
- C. Simplifies circuit troubleshooting and maintenance procedures.
- D. Provides additional aesthetic appeal due to the variety of fuse designs available.

Answer: A

1850. What type of fuse is recommended for protecting sensitive electronic circuits due to its low breaking capacity and precise tripping characteristics?

- A. Semiconductor fuse
- B. Liquid-filled fuse
- C. High-rupture capacity fuse
- D. Cartridge fuse

Answer: A

1851. What factor is not considered when assigning a color code to a fuse?

- A. Current rating of the fuse.
- B. Type of fuse element (e.g., copper, silver)
- C. Voltage rating of the fuse
- D. Intended application (e.g., motor circuit, electronics)

Answer: A

1852. What potential consequence can occur if a time-lag fuse is used in a circuit not designed for its delayed tripping characteristic?

- A. Increased risk of overheating, fire hazards, and circuit damage due to delayed response to overcurrents.
- B. Enhanced arc quenching capabilities and safe interruption of high-energy faults.

- C. Improved efficiency for circuits with frequent starting current surges.
- D. Faster response time and better protection for sensitive electronic components.

Answer: A

1853. What maintenance practice is recommended for ensuring safe and reliable operation of high-voltage fuses?

- A. Regular visual inspection for signs of damage, cracks, or loose connections.
- B. Testing the fuse with a continuity tester to verify its functionality at regular intervals.
- C. Replacing the fuse at pre-determined intervals regardless of its condition.
- D. Leaving the fuse untouched unless a fault occurs in the circuit.

Answer: A

1854. What advantage does a liquid-filled fuse offer compared to a traditional cartridge fuse?

- A. Improved heat dissipation and faster response time due to liquid convection.
- B. Enhanced arc quenching capabilities due to the enclosed liquid chamber.
- C. Increased voltage rating and suitability for high-voltage applications.
- D. Reduced cost and ease of replacement compared to more complex designs.

Answer: A

1855. What characteristic makes a high-rupture capacity (HRC) fuse suitable for protecting large industrial equipment?

- A. Ability to safely interrupt high-energy fault currents due to robust construction.
- B. Low current rating and fast response time for sensitive electronic circuits.
- C. Compact size and ease of installation in small spaces.
- D. Visual indicator window for easy identification of a blown fuse.

Answer: A

1856. How does the construction of a time-lag fuse element differ from a fast-acting fuse element?

- A. Time-lag elements have additional thermal mass or specific heating elements to create a delay.
- B. They are made from different materials with varying melting points and thermal conductivities.
- C. Time-lag elements are physically larger than fast-acting ones.
- D. Their construction has minimal impact on the tripping characteristics.

Answer: A

1857. What potential benefit can be obtained by using a resettable fuse compared to a traditional fuse?

- A. Increased sustainability and reduced waste due to reusability.
- B. Faster response time and enhanced arc quenching capabilities.
- C. Improved compatibility with existing fuse holders and circuits.
- D. Higher current rating and suitability for heavy-duty applications.

Answer: A

1858. What safety precautions should be taken when replacing a blown fuse?

- A. Turn off the power source, wear proper safety gear, and follow lockout/tagout procedures.
- B. Use a screwdriver or pliers to grip the fuse firmly for better leverage.
- C. Test the new fuse with a continuity tester before installing it.
- D. Replace the fuse with one of the same size and color regardless of the circuit requirements.

Answer: A

1859. What is the primary function of a fuse link in a low-voltage cartridge fuse?

- A. Provide mechanical support for the element and connect it to the terminals.
- B. Act as a heat sink and improve the element's cooling efficiency.
- C. Isolate the arc formed during overload and direct it safely away from the fuse body.
- D. Control the voltage drop across the circuit and regulate power flow.

Answer: A

1860. What type of fuse is recommended for protecting circuits in hazardous environments due to its spark-resistant design?

- A. Intrinsic safety fuse
- B. Time-lag fuse
- C. High-rupture capacity fuse
- D. Liquid-filled fuse

Answer: A

1861. What potential benefit can be gained by using a visual indicator window on a high-voltage fuse compared to a solid body design?

- A. Easier and safer identification of a blown fuse without removing the holder.
- B. Enhanced arc quenching capabilities due to increased ventilation.
- C. Improved current rating and ability to handle higher loads.
- D. Reduced cost and simplified fuse replacement procedures.

Answer: A

1862. How can selecting the appropriate fuse holder material impact the safety and performance of the circuit?

- A. Choosing a material with suitable insulating properties and heat resistance can prevent electrical hazards and overheating.
- B. A larger holder size allows for easier installation and handling of the fuse.

- C. Matching the holder's material to the type of fuse element has minimal impact on performance.
- D. Any type of holder will suffice as long as it physically accommodates the fuse.

Answer: A

1863. What potential consequence can occur if a fuse is used in a circuit exceeding its voltage rating?

- A. Increased risk of electrical breakdown and arcing due to exceeding the insulation limits.
- B. Faster response time and improved protection against overcurrents.
- C. Enhanced arc quenching capabilities and safe interruption of high-energy faults.
- D. Improved heat dissipation and extended lifespan of the fuse element.

Answer: A

1864. How does the cross-sectional area of a fuse wire affect its melting point and current rating?

- A. A larger area increases the melting point and allows for a higher current rating.
- B. A smaller area offers faster response times but lower current capacity.
- C. The cross-sectional area has minimal impact on the element's performance.
- D. A larger area reduces the overall resistance of the wire.

Answer: A

1865. What potential consequence can occur if a fuse holder is corroded or damaged?

- A. Increased risk of arcing and electrical hazards due to poor connections.
- B. Improved heat dissipation and longer lifespan of the fuse element.
- C. Enhanced arc quenching capabilities and safe interruption of fault currents.
- D. Faster response time and improved protection against overcurrents.

Answer: A

1866. What is the advantage of using a refill fuse compared to a disposable cartridge fuse?

- A. Reduced cost and environmental impact due to reusable components.
- B. Easier visual inspection of the element for blown status.
- C. Improved safety with enclosed construction and arc quenching mechanisms.
- D. Faster tripping times and higher interrupting rating.

Answer: A

1867. What potential risks are associated with using improper or counterfeit fuses?

- A. Improved circuit efficiency due to lower resistance.
- B. Reduced protection against overcurrents and increased fire hazards.
- C. Enhanced compatibility with different types of fuse holders.
- D. Extended lifespan and greater durability compared to genuine fuses.

Answer: B

1868. What type of fuse is primarily used for protecting power distribution panels in large buildings due to their high current capacity and robust construction?

- A. Microfuse
- B. Blade fuse
- C. Bolt-on fuse
- D. Cartridge fuse

Answer: C

1869. How can improper selection or installation of a fuse impact the performance and safety of a circuit?

- A. Using an incorrect fuse rating or exceeding its voltage limit can lead to overheating, fire hazards, and electrical breakdown.
- B. A slightly larger fuse size may offer increased protection without negatively affecting the circuit.
- C. Incorrect installation methods like loose connections have minimal impact on fuse performance.
- D. Installing a fuse in the wrong orientation disrupts circuit flow but poses no safety risks.

Answer: A

1870. What is the primary purpose of sand filling in some high-voltage fuses?

- A. To improve heat dissipation from the element.
- B. To enhance arc quenching capabilities during overload and suppress potential arcs.
- C. To provide additional mechanical support for the element.
- D. To increase the voltage rating of the fuse.

Answer: B

1871. What characteristic makes a ceramic fuse element suitable for high-voltage applications?

- A. Low specific heat capacity and fast response time
- B. Ductility and malleability for easy installation
- C. High electrical conductivity and reduced voltage drop
- D. High melting point and excellent heat resistance

Answer: D

1872. What potential consequence can occur if a time-lag fuse is used in a circuit not designed for its delayed tripping characteristic?

- A. Enhanced arc quenching capabilities and safe interruption of high-energy faults.
- B. Improved efficiency for circuits with frequent starting current surges.
- C. Increased risk of overheating, fire hazards, and circuit damage due to delayed response

to overcurrents.

D. Faster response time and better protection for sensitive electronic components.

Answer: C

1873. What type of fuse is not recommended for motor circuits due to its fast-acting response time?

A. Fast-acting fuse

B. Time-lag fuse

C. Liquid-filled fuse

D. Cartridge fuse

Answer: A

1874. What potential benefits can be obtained by choosing a high-rupture capacity (HRC) fuse for industrial applications?

A. Enhanced efficiency and lower heat generation in circuits.

B. Reduced cost and wider compatibility with different fuse holders.

C. Faster response time and improved protection for sensitive electronic components.

D. Safe interruption of high-energy fault currents due to robust construction and arc quenching mechanisms.

Answer: D

1875. How can using a resettable fuse benefit the environment compared to traditional disposable fuses?

A. Enhanced arc quenching capabilities and improved safety during fuse replacement.

B. Simpler installation and compatibility with existing fuse holders.

C. Reduced waste and environmental impact due to reusability.

D. Faster response time and better protection against overcurrents.

Answer: C

1876. What safety precautions should be taken when testing a fuse with a continuity tester?

A. Grip the fuse firmly with your bare hands for improved conductivity.

B. Use the tester while the fuse is installed in the circuit for a more accurate reading.

C. Ensure the circuit is de-energized and follow lockout/tagout procedures before any testing.

D. Replace the fuse immediately if the continuity tester indicates a fault.

Answer: C

1877. What information is typically found on the marking of a cartridge fuse?

A. Circuit diagram and recommended replacement procedures.

B. Current rating, voltage rating, type of element, and manufacturer's logo.

- C. Serial number and date of production for traceability.
- D. Expiry date and instructions for safe disposal.

Answer: B

1878. What type of fuse is primarily used in residential appliance circuits due to its affordability and ease of replacement?

- A. Microfuse
- B. Cartridge fuse
- C. Blade fuse
- D. Bolt-on fuse

Answer: C

1879. What are the objectives of earthing?

- A. It provides a path for discharging and de-energizing equipment to carry out maintenance on the equipment
- B. protection of human and animals life by controlling touch and step voltage to safer values
- C. It is used to provide zero potential surface
- D. all of the above

Ans.: D

1880. The process of connecting the metallic frame of electrical equipment or some electrical part of the system to earth is called ____.

- A. Grounding or earthing
- B. earth resistance
- C. resistance of the earth electrode
- D. any of the above

Ans.: A

1881. The resistance of earth should be ____.

- A. low
- B. high
- C. the minimum possible
- D. infinite

Ans.: C

1882. The safety of electrical equipment and wiring is ensured by which of the following?

- A. earthing
- B. providing a fuse
- C. insulation
- D. All of the above

Ans.: D

1883. When moisture falls below ____, resistivity of earth increase sharply.

- A. 20%
- B. 40%

C. 50%

D. 10%

Ans.: A

1884. Earth electrodes can be in the form of ____.

A. pipe, plate

B. strip

C. wire

D. all of the above

Ans.: D

1885. Earthing is necessary to give protection against ____.

A. Electric shock

B. voltage fluctuation

C. over loading

D. none of the above

Ans.: A

1886. The earth wire should not be size than

A. 20 SWG

B. 10 SWG

C. 25 SWG

D. 5 SWG

Ans.: B

1887. The earth wire should be of ____.

A. mechanically strong

B. good conductor of electricity

C. mechanically strong

D. A and B

Ans.: D

1888. On what basis the size of the earth wire is determine?

A. current carrying capacity of line

B. voltage of the service line

C. Symmetrical fault

D. any of the above

Ans.: A

1889. For domestic wiring, the minimum size of wire should be not less than

A. 10 SWG

B. 14SWG

C. 20SWG

D. 25 SWG

Ans.: B

1890. Earth wire is made up of__.

- A. Copper
- B. Aluminium
- C. Galvanized steel
- D. Silver

Ans.: C

1891. The earth potential is taken as ____.

- A. high
- B. low
- C. infinite
- D. zero

Ans.: D

1892. ____ site will be preferred for earthing.

- A. dry and rocky
- B. damp and wet sand pit
- C. clayey soil
- D. wet mashy ground

Ans.: D

1893. which of the following is least preferred for earthing?

- A. earth mixed with salt and charcoal
- B. dry earth
- C. clayey soil
- D. all of the above

Ans.: B

1894. The minimum current a human can feel is approximately equal to ____.

- A. 5 mA
- B. 1 mA
- C. 10 mA
- D. 15 mA

Ans.: B

1895. The perception of electric shock can be depends on the ____.

- A. magnitude of the voltage, frequency
- B. duration of flow of current
- C. current, path taken
- D. All of the above

Ans.: D

1896. The effect of an electric shock is/are ____.

- A. cause death
- B. skin burns
- C. Neurological effect
- D. All of the above

Ans.: D

1897. Death caused by an electric shock is known as____.

- A. Neurological effect
- B. Electrocution
- C. Ash-flash hazards
- D. none of the above

Ans.: B

1898. ____ can occur if a human's body comes in contact with any source of voltage enough high to force a sufficient current through the body.

- A. electric hazards
- B. electric shock
- C. Earthing
- D. None of the above

Ans.: B

1899. The resistance of the earth should be maintained __ for domestic installation.

- A. 1 Ohm
- B. 3 Ohm
- C. 5 Ohm
- D. 10 Ohm

Ans.: C

1900. Q.22 ____ color of wire is used for earthing.

- A. Red
- B. Blue
- C. Black
- D. Green

Ans.: D

1901. Disadvantages of earthing.

- A. Very expensive due to the provision of a complete system of protective conductors, earth electrodes etc.
- B. Possible safety hazard
- C. Both A and B
- D. none of the above

Ans.: C

1902. A conductor which connects a part of an electrical installation, exposed conductive part to a earth electrode is known as____.

- A. Earthing conductor
- B. Earthing plate
- C. Earth electrode
- D. any of the above

Ans.: A

1903. _____ is the voltage occurring between the earthing system and reference earth at a given value of earth current flowing through earthing system.

- A. Earth electrode
- B. Earth voltage or earth potential
- C. Earth resistivity
- D. None of the above

Ans.: B

1904. Earth surface potential is the voltage between a point x on the earth's surface and__.

- A. Earth resistance
- B. Earth potential
- C. Reference earth
- D. any of the above

Ans.: C

1905. _____ is the resistance, measured between two opposite faces.

- A. Earth potential
- B. Earth resistance
- C. Earth resistivity or specific earth resistance
- D. all of the above

Ans.: C

1906. If moisture of earth is increases then earth resistance is ____.

- A. Decrease
- B. Increases
- C. cannot changes
- D. none of the above

Ans.: D

1907. While designing Ground resistance which of the following is considered?

- A. Ground resistance should be as high as possible
- B. Ground resistance should be as low as possible
- C. ground resistance should be zero
- D. none of the above

Ans.: B

1908. Average resistance of human

- A. 1000 Ohms
- B. 5000 ohms
- C. 10 ohms
- D. 100 ohms

Ans.: A

1909. What is earth current?

- A. The current dissipated by the earth electrode into the ground
- B. the current at time of earth fault
- C. the current at which the protective system operated
- D. all of the above

Ans.: A

1910. The current range of 1.6 mA, do not impair the person ability. It is also known as ____.

- A. Fault current
- B. Let go current
- C. normal current
- D. none of the above

Ans.: B

1911. The body can tolerate ____ direct current than alternating current at 50 Hz.

- A. lower
- B. same
- C. higher
- D. can't decide

Ans.: C

1912. The current is higher than ____ , dangerous for human body.

- A. 10 mA
- B. 20 mA
- C. 100 mA
- D. 60 mA

Ans.: D

1913. The current range of ____ , may be painful and affect person ability.

- A. 10-15 mA
- B. 9-25 mA
- C. 50-60 mA
- D. 100-150 mA

Ans.: B

1914. The permissible current and duration should be less than that required for ventricular fibrillation of the heart and is calculated by the following equation for up to 3 sec. (Person of 50 kg)

- A. $I_B = 0.116/\sqrt{t}$
- B. $I_B = 1.16/\sqrt{t}$
- C. $I_B = 116/\sqrt{t}$
- D. $I_B = 11.6/\sqrt{t}$

Ans.: A

1915. The lower the resistivity ____ the earthing resistance.

- A. higher

- B. lower
- C. cannot change
- D. none of the above

Ans.: B

1916. Earthing of more than one point is used in ____ and higher voltage system.

- A. 32 kV
- B. 66 kV
- C. 220 kV
- D. 132 kV

Ans.: C

1917. A coil type electrode, a coil of GI wire of ____ size is made.

- A. 5 SWG
- B. 14 SWG
- C. 15 SWG
- D. 8 SWG

Ans.: D

1918. Resistivity of concrete becomes approximately equal to _____ Ωcm at 20°C under the ground which is less than the average earth resistivity.

- A. 5000
- B. 1000
- C. 3000
- D. 2500

Ans.: C

1919. Cross section area of the earthing lead should not be ____ of the main conductor.

- A. more than
- B. less than half
- C. equal
- D. none of the above

Ans.: B

1920. The earth conductor which connects the main switch board to the distribution board is called as ____.

- A. main earthing conductor
- B. sub earthing conductor
- C. Earthing leads
- D. any of the above

Ans.: B

1921. The earth wire which is run from the distribution board to different switch boards is called as the ____.

- A. Earth electrode
- B. main earthing conductor
- C. Earth continuity conductor

D. all of the above

Ans.: C

1922. The size of the earth continuity conductor should not be less than __.

A. 14 SWG (2.894 mm²)

B. 28 SWG

C. 15 SWG

D. 8 SWG

Ans.: A

1923. The maximum permissible value of earth resistance for small substation is __.

A. 5 ohms

B. 10 ohms

C. 20 ohms

D. 100 ohms

Ans.: A

1924. In plate earthing, the size of copper plate _____ is used.

A. 300 mm x 300 mm x 3 mm

B. 100 mm x 100 mm x 1 mm

C. 600 mm x 600 mm x 3 mm

D. 200 mm x 200 mm x 2 mm

Ans.: C

1925. In plate earthing, the size of Aluminium plate _____ is used.

A. 600 mm x 600 mm x 6 mm

B. 200 mm x 200 mm x 2 mm

C. 600 mm x 600 mm x 3 mm

D. 600 mm x 600 mm x 30 mm

Ans.: A

1926. In plate earthing, the plate is buried vertically in the ground at the depth of __.

A. not less than 1.5m

B. not less than 3m

C. not less than 1m

D. not less than 0.5m

Ans.: B

1927. Alternate layer of _____ and _____ each 150 cm thick are kept around plate of the plate earthing method.

A. charcoal, soil

B. charcoal, concrete

C. charcoal, salt

D. any of the above

Ans.: C

1928. In plate earthing, four to five bucket of water is poured at the regular of few days. This is because of__.

- A. to increase earth resistance
- B. to reduced earth resistance
- C. to increase earth potential
- D. to decrease earth potential

Ans.: B

1929. The plate earthing system is employed for the _____ and the _____ where there is possibility of more fault.

- A. generator, substation
- B. substation, transmission line
- C. transmission line, big power stations
- D. transmission line, small power station

Ans.: D

1930. In pipe earthing, _____ pipe is used.

- A. galvanized iron
- B. aluminium
- C. iron
- D. any of the above

Ans.: A

1931. The size of the galvanized iron pipe used in pipe earthing methods.

- A. 25 mm diameter and 1 to 1.5 m long
- B. 38 mm diameter and 2 to 2.5 m long
- C. 10 mm diameter and 1 to 2 m long
- D. 50 mm diameter and 2 to 2.5 m long

Ans.: B

1932. A pit of size _____ made of concrete and 12.5 cm thick is constructed above the end of pipe in pipe earthing method.

- A. 30 mm x 30 mm x 30 mm
- B. 40 mm x 40 mm x 40 mm
- C. 50 mm x 50 mm x 50 mm
- D. any of the above

Ans.: A

1933. A pipe earthing method of earthing is employed in _____ and _____ where there is possibility of comparatively small fault current.

- A. large power station, small sub station
- B. small power stations, sub stations
- C. transmission line, large power station
- D. Generating station, large power station

Ans.: B

1934. Small holes of _____ diameter are drilled at the spacing of ____ in pipe earthing.

- A. 10mm, 10 cm
- B. 12 mm, 12 mm
- C. 12 mm, 15cm
- D. 12cm, 15mm

Ans.: C

1935. Plate and pipe earthing are used where the soil is ____.

- A. comparatively soft
- B. soil may be sandy
- C. rocky
- D. any of the above

Ans.: A

1936. In coil earthing method, alternate layer of charcoal and salt each ____ thick are provided around the coil.

- A. 150mm
- B. 300mm
- C. 450mm
- D. 600mm

Ans.: B

1937. Coil earthing is employed for the earthing of the ____.

- A. distribution substation
- B. Intermediate substation
- C. Transmission line
- D. distribution poles

Ans.: D

1938. Special earthing methods are employed for land is like sandy, rock ect.

- A. method of earthing in sandy bed
- B. method of earthing in rocky bed
- C. method of earthing of extra high voltage system
- D. all of the above

Ans.: D

1939. Plate earthing and pipe earthing are used where the soil is ____.

- A. Comparatively rocky
- B. Comparatively soft
- C. comparatively sandy
- D. all of the above

Ans.: B

1940. The value of the earth resistance decreases as the electrodes are connected in ____.

- A. series
- B. parallel
- C. series-parallel
- D. none of the above

Ans.: B

1941. The value of earth resistance is _____ to the square of the distance.

- A. directly proportional
- B. inversely proportional
- C. not defined
- D. none of the above

Ans.: B

1942. As the distance from the electrode increase, the earth resistance ____

- A. increases
- B. decrease
- C. cannot change
- D. none of the above

Ans.: B

1943. Earth resistance should be _____ when the capacity of the equipment is ____.

- A. more, more
- B. less, less
- C. more, less
- D. less, more

Ans.: D

1944. Which of the following is correct as the maximum permissible earthing resistance for different installation as per Indian electricity rules.

- A. small substation = 2.00 ohms
- B. Domestic installation = 8.00 ohms
- C. big power station or substation = 1.00 ohms
- D. all of the above

Ans.: D

1945. Which of the following factors increase the earth resistance?

- A. reduced amount of moisture in soil
- B. rust between joints
- C. loose connections
- D. all of the above

Ans.: D

1946. Less contact is made when the connection is loose so the ____.

- A. resistance decreases
- B. moisture increases
- C. resistance increases
- D. Temperature of the contact increases

Ans.: C

1947. Rust is developed at the joint due to ____.

- A. the moisture in the atmosphere

- B. if the plate or rod buried in earth
- C. due to loose contact
- D. Both A and B

Ans.: D

1948. The earth resistance in summer season as compared to monsoon season is __.

- A. more
- B. less
- C. equal in both the season
- D. Cant defined

Ans.: A

1949. which of the following methods are used to measure the earth resistance?

- A. Voltmeter-ammeter method
- B. Earth loop tester and earth tester method
- C. ohm meter method
- D. all of the above

Ans.: D

1950. Earth tester is an instrument to measure __.

- A. high resistance
- B. low resistance
- C. medium resistance
- D. extra high resistance

Ans.: B

1951. ____ is used to measure earth loop resistance between the substation and place of use.

- A. voltmeter-ammeter method
- B. Ohms meter method
- C. Loop tester method
- D. none of the above

Ans.: C

1952. Many times static electric charges are produced due to friction between the two rotating parts which produces potential difference between these two parts. These two are joined by a flexible conductor is called as ____.

- A. Grounding
- B. welding
- C. bonding
- D. soldering

Ans.: C

1953. Earthing of the following parts should be done in substation and generating station:

- A. Metal framework not related to power system such as steel structure
- B. Equipments related to each system such as framework, non conducting parts
- C. Neutral point of systems of different voltages
- D. all of the above

Ans.: D

1954. _____ and _____ mechanism should be earthed through separate branch.

- A. Circuit breaker, earth switch
- B. Isolators, circuit breaker
- C. Isolators, earth switch
- D. Relay, earth switch

Ans.: C

1955. The poles of the transmission line are kept in ground their earthing is automatically done, even though a separate earthing has to be made when the ____.

- A. soil has less resistivity
- B. soil has more resistivity
- C. Soil has high conductivity
- D. none of the above

Ans.: B

1956. Earth wire of the overhead line should be earthed at every ____ distance by preparing an independent earth pit.

- A. 10 km
- B. 5.5 km
- C. 6.5 km
- D. 15 km

Ans.: C

1957. Earth wire of the over head line gives protection against ____ also.

- A. Earth fault
- B. line to line fault
- C. breakdown of conductor
- D. lightening

Ans.: D

1958. Earthing of neutral in power system can be provided by which of the following?

- A. solid earthing and transformer earthing
- B. resistance and reactance earthing
- C. Peterson coil or suppression coil earthing
- D. all of the above

Ans.: D

1959. Solid earthing system is employed up to ____.

- A. 11 kV
- B. 33 kV
- C. 66 kV
- D. 132 kV

Ans.: B

1960. The resistance earthing method is used for the system having voltages of ____ and the capacity of power source is more than ____.

- A. 2.2 kV to 33 kV, 5 MVA
- B. 22 kV to 33 kV, 10 MVA
- C. 33 kV to 66 kV, 5 MVA
- D. 132 kV to 400 kV, 500 MVA

Ans.: A

1961. Reactance earthing method can be employed where the value of the _____ is more.

- A. Fault current
- B. Charging current
- C. Earth fault current
- D. leakage current

Ans.: B

1962. In ____ type earthing system the other healthy phases can supply power when a ground fault occurs on one phase.

- A. reactance earthing
- B. Resistance earthing
- C. Peterson coil
- D. any of the above

Ans.: C

1963. Peterson coil is also called as ____.

- A. Arc suppression coil
- B. ground fault neutralizer
- C. Both A and B
- D. None of the above

Ans.: C

1964. The grounding obtain by Peterson coil is called as ____.

- A. resonant grounding
- B. neutral grounding
- C. system grounding
- D. all of the above

Ans.: A

1965. In which type of earthing system tapings are provided so if there is change in the length of the line or in the capacitance of the line, the value of inductance can be adjusted with the help of taping?

- A. reactance earthing method
- B. Resistance earthing method
- C. Peterson or arc suppression method
- D. Solid earthing method

Ans.: C

1966. Neutral is not available when system is ____.

- A. star connected
- B. delta connected
- C. star-delta

D. none of the above

Ans.: B

1967. IF we double the radius of an electrode, the resistance would decrease only by ____.

A. 20 %

B. 30 %

C. 10 %

D. 25 %

Ans.: C

1968. Which of the following is/are correct regarding soil resistivity?

A. Rock = 1000- 1000 ohm-m

B. Ice = 10000 – 100000 ohm-m

C. Sea water = 0.1 – 10 ohm-m

D. all of the above

Ans.: D

1969. soil resistivity is expressed in ____.

A. Ohm-meter

B. Ohm/ meter

C. Ohm

D. meter/ohm

Ans.: A

1970. The two main factors which influence the soil resistivity value are the ____ and ____.

A. porosity of the material

B. the water content

C. type of electrodes

D. Both A and B

Ans.: D

1971. The ____ and ____ have an important influence on the soil resistivity and hence on the performance of earthing system.

A. Temperature

B. Water content

C. Both A and B

D. none of the above

Ans.: C

1972. Why it is necessary to install the electrodes beneath the freezing line?

A. Ice has very high resistivity as compared to water

B. Ice has very low resistivity as compared to water

C. Ice and water are same resistivity

D. Any of the above

Ans.: A

1973. The water content varies with seasonally and likely to cause variation in the ____.

A. Temperature of earth

- B. Electrode conductivity
- C. resistance of earthing system
- D. all of the above

Ans.: C

1974. Which of the following is/are correct formula for calculation of soil resistivity?

- A. $\rho = \pi AR$
- B. $\rho = 2AR$
- C. $\rho = 2\pi R$
- D. $\rho = 2\pi AR$

[ρ = average soil resistivity in ohm-cm, A= distance between the electrode, R= the measured resistance value in ohm]

Ans.: D

1975. _____ in the water further reduced the resistivity of earthing particular where there are naturally occurring and do not dilute with time.

- A. Dissolve minerals
- B. salt
- C. Both A and B
- D. None of the above

Ans.: C

1976. If the working voltage of the transmission line is very high, the magnitude of earth fault current is also ____.

- A. very low
- B. very high
- C. depend on soil
- D. all of the above

Ans.: B

1977. The size of the conductor must be chosen in such a way that it can withstand the _____ produced by earth fault current until the protective relay comes into action and isolates the faulty portion of the system.

- A. high resistance
- B. high earth fault current
- C. high temperature
- D. high voltage

Ans.: C

1978. Which of the following is correct for the minimum cross sectional area of the earth conductor?

- A. $A = I_{\text{fault}}/C \text{ mm}^2$
- B. $A = I_{\text{fault}}\sqrt{t} \text{ mm}^2$
- C. $A = \sqrt{t}/C \text{ mm}^2$
- D. $A = I_{\text{fault}}\sqrt{t}/C \text{ mm}^2$

Ans.: D

[A = minimum area of conductor required, t = time in second which is required for the operation of the C.B, C = constant whose value depends upon the nature of material]

1979. The melting point of aluminium is ____ than copper.

- A. higher
- B. less
- C. equal
- D. none of the above

Ans.: B

1980. The ____ is defined as the potential difference between two steps of a person standing on the ground with feet apart during the flow of earth fault current.

- A. Earth resistivity
- B. Earth resistance
- C. Electrode resistance
- D. Step potential

Ans.: D

1981. ____ consists of large number of rods which are connected through the copper conductor.

- A. Earthing mat
- B. Earthing wire/ conductor
- C. Earthing electrode
- D. All of the above

Ans.: A

1982. The material used for the grounding conductor should have ____ and ____.

- A. low conductivity, low underground corrosion
- B. high conductivity, high underground corrosion
- C. high conductivity, low underground corrosion
- D. low conductivity, high underground corrosion

Ans.: C

1983. The modern trend is towards the use of ____ in place of copper for the material use for grounding.

- A. steel
- B. Aluminium
- C. tungsten
- D. all of the above

Ans.: A

1984. Which of the following information is necessary to obtain for design of substation earthing grid for substation?

- A. maximum earth fault current, fault clearing time
- B. Area covered by the substation
- C. Resistivity of the soil at the sub-station site

D. All of the above

Ans.: D

1985. The degree of protection provided by a grounding system under lightning discharge conditions depends upon its _____ rather than on power frequency impedance.

A. Resistance

B. impulse impedance

C. reactance

D. all of the above

Ans.: B

1986. What is impulse impedance?

A. The impedance under normal conditions

B. The impedance under impulse conditions

C. The impulse under transient conditions

D. All of the above

Ans.: B

1987. The impulse impedance is always _____ than its power frequency impedance.

A. lower

B. higher

C. equal

D. any of the above

Ans.: B

1988. Resistivity of water depends on the _____ and _____ of salt dissolved in it.

A. amount, nature

B. temperature, nature

C. purity, nature

D. none of the above

Ans.: A

1989. Pure water is poor conductor of _____.

A. temperature

B. sound

C. electricity

D. all of the above

Ans.: C

1990. Which of the following is/are correct for effect of current flowing through human body?

A. Below 1 mA = nothing

B. 11 to 25 mA = painful shock with muscle contraction after medical treatment they can restore

C. Above 150 mA = cardiac arrest, body starts burning resulting into death

D. All of the above

Ans.: D

1991. Current flows from earthing grid during ____ creating potential difference.

- A. operation and working
- B. faults
- C. lighting
- D. all of the above

Ans.: D

1992. Impulse performance of earthing system depends on which of the following factors?

- A. Electrical soil properties
- B. ground electrode geometry
- C. current waveform properties
- D. all of the above

Ans.: D

1993. Tower footing resistance should be below ____.

- A. 10 Ω
- B. 50 Ω
- C. 40 Ω
- D. 20 Ω

Ans.: A

1994. Material used for tower footing can be ____.

- A. iron clad
- B. copper plates
- C. Both A and B
- D. tungsten

Ans.: C

1995. ____ is very good in improving or increasing the conductivity of soil as compared to others.

- A. Sea water
- B. pure water
- C. Common salt
- D. Drinking water

Ans.: C

1996. A human body can tolerate a current slightly higher than ____.

- A. 10 Hz
- B. 5 Hz
- C. 15 Hz
- D. 25 Hz

Ans.: D

1997. If the depth of the earth electrode increases, the value of ground resistance can be ____.

- A. increases
- B. minimized
- C. does not depend on the depth of electrode
- D. none of the above

Ans.: B

1998. Which of the following common paths for current to flow through the body?

- A. Hand to foot
- B. Hand to hand through the chest
- C. Foot to foot
- D. all of the above

Ans.: D

MEASUREMENTS AND MEASURING INSTRUMENTS

1999. A voltmeter has a uniform scale with 100 divisions. The full-scale reading is 10 V and could be read upto 1/10 of a scale division with some degree of certainty. Its resolution is

- (a) 0.1 V
- (b) 0.02 V
- (c) 0.01 V
- (d) 0.001 V

Ans: (c)

2000. Three DC voltmeters are connected in series across a 120 V DC supply. The Voltmeters are specified as follows. Voltmeter A: 100V, 5mA, Voltmeter B: 100V, 250 Ω /Volt, Voltmeter C: 10mA, 15 k Ω . The voltage read by the meter A, B, and C are respectively.

- (a) 40, 50 and 30
- (b) 40, 40 and 40
- (c) 60, 30 and 30
- (d) 30, 60 and 30

Ans: (a)

2001. If the DC voltmeter is made from an ammeter having a full-scale deflection of 100 μ A, then its sensitivity in (k Ω /V) will be

- (a) 1
- (b) 10
- (c) 100
- (d) 1000

Ans: (b)

2002. The difference between the indicated value and true value of quantity is known as

- (a) Gross error

- (b) Absolute error
- (c) Dynamic error
- (d) Relative error

Ans: (b)

2003. Loading effect is primarily caused by instruments having

- (a) High resistance
- (b) High sensitivity
- (c) Low sensitivity
- (d) High range

Ans: (c)

2004. When reading is taken at half scale in the instrument, the error is

- (a) Exactly equal to half of full-scale error
- (b) Equal to full-scale error
- (c) Less than full-scale error
- (d) More than full-scale error

Ans: (d)

2005. The energy capacity of a storage battery is rated in

- (a) kWh
- (b) kW
- (c) Ampere hours
- (d) Joules

Ans: (c)

2006. Torque/weight ratio of an instrument indicates

- (a) Selectivity
- (b) Accuracy
- (c) Fidelity
- (d) Sensitivity

Ans: (d)

2007. A 100 mA meter has accuracy of $\pm 2\%$. Its accuracy while reading 50 mA will be:

- (a) $\pm 1\%$
- (b) $\pm 2\%$
- (c) $\pm 4\%$
- (d) $\pm 20\%$

Ans: c

2008. A precision current shunt is measuring 200 mV across it and also indicates a current of 30A. What is the actual resistance of this shunt?

- (a) 0.006Ω
- (b) 0.30Ω
- (c) 30Ω
- (d) 6Ω

Ans: (a)

2009. Which of the following is likely to have the largest resistance?

- (a) Moving coil Galvanometer
- (b) Voltmeter of range 10V
- (c) Ammeter of range 1A
- (d) A copper wire of length 1m and 3mm diameter

Ans: (b)

2010. A 0-10A ammeter has a guaranteed accuracy of 1% of full scale deflection, the limiting error while reading 2.5A will be

- (a) 1%
- (b) 2%
- (c) 4%
- (d) None of these

Ans: (c)

2011. Perfect reproducibility means the instrument has

- (a) Zero drift
- (b) High accuracy
- (c) Maximum drift
- (d) Minimum accuracy

Ans: (a)

2012. To reduce the loading effect, an instrument must possess:

- (a) Zero input impedance
- (b) Unit input impedance
- (c) High input impedance
- (d) Low input impedance

Ans: (c)

2013. works on the chemical effect of current.

- (a) Power factor meter
- (b) Voltmeter
- (c) DC ampere hour meter
- (d) Wattmeter

Ans: (c)

2014. Which of the following scale offers widest range for measurement through an instrument?

- (a) Logarithmic Scale
- (b) Exponential Scale
- (c) Linear Scale
- (d) Square-law Scale

Ans: (a)

2015. Which of the following comes under the category of systematic errors in instruments?

- (a) Blunders
- (b) Gross errors
- (c) Random errors
- (d) Instrumental errors

Ans: (d)

2016. The permanent magnet moving coil type instruments are best suited for

- (a) A.C Measurement
- (b) D.C Measurement
- (c) A.C/D.C Measurement
- (d) Frequency measurement

Ans: (b)

2017. A meter reads 127.50 V and the true value of the voltage is 127.43 V Calculate the static error

- (a) 254.93V
- (b) 127.465V
- (c) +0.07V
- (b) - 0.07V

Ans: (c)

2018. Electric field is defined as the electric force per unit

- (a) Length
- (b) Charge
- (c) Flux
- (d) Momentum

Ans: (b)

2019. An instrument transformer is used to extent the range of

- (a) Induction instrument
- (b) Electrostatic instrument
- (c) Moving coil instrument
- (d) PMMC instrument

Ans: (a)

2020. Which of the following instrument is not affected by hysteresis and eddy current errors?

- (a) Electrostatic
- (b) Permanent magnet moving coil
- (c) Moving Iron
- (d) Dynamometer type moving coil

Ans: (a)

2021. Error detector is also called as

- (a) Multiplexer
- (b) Decoder
- (c) Comparator
- (d) Integrator

Ans: (c)

2022. The ratio of output change for a given measuring system is referred to as

- (a) Sensitivity
- (b) Linearity
- (c) Stability
- (d) Fidelity

Ans: (a)

2023. Repeatability and Reproducibility are related to:

- (a) Accuracy of the instrument
- (b) Precision of the instrument
- (c) Both accuracy of the instrument & precision
- (d) None of these

Ans: (b)

2024. Which of the following is true?

- (a) Accuracy can be achieved without precision
- (b) Precision can be achieved without accuracy
- (c) Both Accuracy can be achieved without precision & Precision can be without accuracy
- (d) None of these

Ans: (b)

2025. A set of readings has a wide range and therefore it has ---

- (a) High precision
- (b) High accuracy
- (c) Low accuracy
- (d) Low precision

Ans: (d)

2026. In a measurement systems, which of the following static characteristic are desirable.

- (a) Accuracy
- (b) Sensitivity
- (c) Reproducibility
- (d) All of these

Ans: (d)

2027. A 100 mA meter has an accuracy of $\pm 2\%$. Its accuracy while reading 10 mA will be

- (a) $\pm 2\%$
- (b) $\pm 0.2\%$
- (c) $\pm 4\%$
- (d) $\pm 20\%$

Ans: (d)

2028. A generated voltage is equally dependent on three resistances R_1 , R_2 , R_3 and its value $V = R_1 R_2 / R_3$. If tolerance of each resistor is 0.1%, what will be the maximum error in voltage?

- (a) 0.03%
- (b) $\pm 0.3\%$
- (c) 0.01%
- (d) $\pm 0.1\%$

Ans: (b)

2029. Which one of the following statements correctly response the systematic error?

- (a) These error can be calculated from the details of the instrument

- (b) These are the residual errors
- (c) These errors may occur under controlled conditions
- (d) These are the error committed by the experiments

Ans: (a)

2030. For accuracy of the instrument which is necessary-

- (a) Conformity
- (b) Precision
- (c) Both (a) and (b)
- (d) None of these

Ans: (c)

2031. A null type of instrument as compared to a deflecting type instrument has

- (a) Higher accuracy
- (b) Lower sensitivity
- (c) Faster response
- (d) All of the above

Ans: (a)

2032. Calculate the limiting error of an ammeter of range 25A given also that it has a guaranteed accuracy of 1% of full-scale reading. The current measured by the ammeter is 5A.

- (a) 2%
- (b) 2.5%
- (c) 4%
- (d) 5%

Ans:

(d)

2033. Choose the INCORRECT statement amongst the given statements.

- (a) Sensitivity of an instrument is directly proportional to deflection factor
- (b) Precision of an instrument does not assures accurate results
- (c) An instrument with more significant figures has more precision
- (d) An instrument required high degree of sensitivity

Ans: (a)

2034. The pointer of an indicating instrument should be:

- (a) very light
- (b) very weighty
- (c) light
- (d) weighty

Ans: (a)

2035. The most suitable material for spring in majority of the measuring instruments, except in low resistance instruments is :

- (a) Phosphor-bronze
- (b) Platinum silver
- (c) Hard rolled silver

(d) Silicon-bronze

Ans: (a)

2036. A pointer of the instrument once deflected returns to zero position when the current is removed due to :

- (a) Action of gravity
- (b) Mass of the pointer
- (c) Controlling torque
- (d) Damping torque

Ans: (c)

2037. In an instrument transformer the errors can be reduced by

- (a) Using high reluctance core
- (b) Using small cross sectional area
- (c) Using low permeability materials
- (d) Using low reluctance core

Ans: (d)

2038. In an Induction type meter, maximum torque is produced when the phase angle between two fluxes is-

- (a) 0°
- (c) 60°
- (b) 45°
- (d) 90°

Ans: (d)

2039. Which of the following describes the linearity of an instrument?

- (a) Largest change in measured variable which produces no instrument response
- (b) Closeness of the calibration curve to a specified straight line
- (c) Closeness of the indicated value to the measured
- (d) Range of an inaccuracy which can be tolerated

Ans: (b)

2040. In a critically damped system, the damping factor of the system is

- (a) Zero
- (b) Less than unity
- (c) Unity
- (d) Greater than unity

Ans: (c)

2041. Indicating instruments should be

- (a) undamped
- (b) critically damped
- (c) over damped
- (d) under damped

Ans: (d)

2042. Determine the absolute error of measurement if measured value of a resistance = 20.65Ω and true value = 20.55Ω .

- (a) 0.1Ω
- (b) 0.2Ω
- (c) 0.3Ω
- (d) 0.4Ω

Ans: (a)

2043. Which torque is essential for indicating instruments

- (a) Deflecting
- (b) Controlling
- (c) Damping
- (d) All of these

Ans: (d)

2044. Damping torque is essential to

- (a) Increase oscillation
- (b) Reduce oscillation
- (c) Maintain oscillation unchanged
- (d) None of these

Ans: (b)

2045. Which instrument has/have uniform scale?

- (a) Spring control instrument
- (b) Gravity control instrument
- (c) Both (a) and (b)
- (d) None of these

Ans: (a)

2046. Ideally, the damping torque should be

- (a) proportional to velocity of the moving system and operating current
- (b) proportional to the velocity of the moving system but independent of operating current
- (c) independent of the velocity of the moving system and proportional to the operating Current
- (d) Independent of the velocity of the moving system and operating current

Ans: (b)

2047. In case of over damping the instrument will become

- (a) Oscillating
- (b) Dead
- (c) Fast and sensitive
- (d) Slow and lethargic

Ans: (d)

2048. The damping force acts on the moving system of an indicating instrument only when it is

- (a) Moving
- (b) Stationary
- (c) Near its full deflection
- (d) Just starting to move

Ans: (c)

2049. Two meters X and Y require 40 mA and 50mA for full scale deflection. Which of the following is correct?

- (a) X is more sensitive
- (b) Y is more sensitive
- (c) Both are equally sensitive
- (d) It is not possible to determine the relation between the sensitivity of the meters from the given data

Ans: (a)

2050. 55. A zero to 300V voltmeter has an error of 2% on full scale deflection. If the true voltage is 30V then the range of readings on this voltmeter will be:

- (a) 20 to 40 V
- (b) 26.4 to 33.6 V
- (c) 29.4 to 30.6 V
- (d) 24 to 36 V

Ans: (d)

2051. The most basic of all instrument is

- (a) The current meter
- (b) The voltmeter
- (c) The multimeter
- (d) The oscilloscope

Ans: (b)

2052. A voltage using a 20 μ A meter movement has a sensitivity of

- (a) 20 $\mu \Omega$ /V
- (b) 1000 Ω /V
- (c) 20,000 Ω /V
- (d) 50,000 Ω /V

Ans: (d)

2053. A voltmeter uses a meter with $I_{fs}=2$ mA. Its sensitivity is

- (a) 500 Ω /V
- (b) 500 V/ Ω
- (c) 200 Ω /V
- (d) 2000 V/ Ω

Ans: (a)

2054. The sensitivity of a voltmeter using 0 to 20 mA meter movement is :

- (a) 500 ohm/volt
- (b) 100 ohm/volt
- (c) 50 ohm/volt
- (d) 20 ohm/volt

Ans: c

2055. The span of a zero centered voltmeter having a scale from -15 V to +15 Vis:

- (a) -30 V

- (c) 0 V
- (b) 30 V
- (d) 15 V

Ans: (b)

2056. The voltage of a circuit is measured by a voltmeter whose input impedance is low as compared to the output impedance of the circuit. The error caused will be due to

- (a) Random error
- (b) Loading effect
- (c) Gross error
- (d) System error

Ans: (b)

2057. If a galvanometer is sensitive, it will provide large deflection on providing

- (a) no current
- (b) large power
- (c) small current
- (d) large voltage

Ans: (c)

2058. Resistance can be measured by- 1. Ohmmeters 2. Resistance bridges 3. Wattmeters 4. Ampere-hour meters

- (a) 2 and 3 only
- (b) 2, 3 and 4 only
- (c) 1 and 3 only
- (d) 1 and 2 only

Ans: (d)

2059. Which of the following cannot be measured by multimeters?

- (a) Frequency
- (b) Current
- (c) Resistance
- (d) Voltage

Ans: (a)

2060. Zero adjustment becomes necessary in analog multimeter before measuring:

- (a) Wattage
- (b) Resistance
- (c) Current
- (d) Voltage

Ans: (b)

2061. The largest change in the measured variable which produces no instrument response is called :

- (a) Dead band
- (b) Dynamic error
- (c) Fidelity

(d) Threshold

Ans: (a)

2062. What is a Weston frequency meter?

- (a) Moving coil instrument
- (b) Moving iron instrument
- (c) Dynamometer type instrument
- (d) Induction instrument

Ans: (b)

2063. What is the name of the instrument used to measure the specific density of a battery :

- (a) Pyrometer
- (b) Hydrometer
- (c) Lactometer
- (d) Fuel gauge

Ans: (b)

2064. What principle makes the instrument transformer working?

- (a) Selfinduction
- (b) Lenz law
- (c) Mutual induction
- (d) Fleming's right hand rule

Ans: c

2065. Which instrument is the cheapest disregarding the accuracy?

- (a) PMMC
- (b) Moving iron
- (c) Rectifier
- (d) Electrodynamometer

Ans: (b)

2066. 1 mA ammeter has a resistance of 100Ω . It is to be converted to a 1A ammeter. The value of shunt resistance is

- (a) $0.001\ \Omega$
- (b) $0.1001\ \Omega$
- (c) $1,00,000\ \Omega$
- (d) $100\ \Omega$

Ans: (b)

2067. Electrostatic instruments are used as only

- (a) Ammeters
- (b) Voltmeters
- (c) Watt meters
- (d) Energy meters

Ans: (b)

2068. A 50V range voltmeter has a sensitivity of $20k\ \Omega/V$. The total resistance of the voltmeter is

- (a) $2.5\ k\Omega$

- (b) 0.4 k Ω
- (c) 10 k Ω
- (d) 1 M Ω

Ans: (d)

2069. Transformers used in conjunction with measuring instruments for measurement of high voltage and high currents are called

- (a) Transformers meters
- (b) Power transformers
- (c) Pulse transformers
- (d) Instrument transformers

Ans: (d)

2070. If the connections of a moving iron voltmeter connected in a circuit are interchanged, the voltmeter

- (a) Will not give any deflection
- (b) Will deflect in opposite direction
- (c) Reading will remain unaffected
- (d) Will burn out

Ans: (c)

2071. Which of the following instruments is exclusively used for measuring radio frequency currents?

- (a) Moving iron
- (b) Thermocouple
- (c) PMMC
- (d) Electrodynamic

Ans: (b)

2072. The ratio error in the current transformer is attributed to

- (a) Magnetizing component of no-load current
- (b) Energy component of excitation current
- (c) Leakage flux
- (d) Power factor of the primary

Ans: (a)

2073. An instrument gives maximum deflection for any amount of quantity passed through it. Which of the following pairs is present?

- (a) Deflecting and controlling
- (b) Controlling and damping
- (c) Deflecting and damping
- (d) Deflecting, controlling and damping

Ans: (c)

2074. A moving coil galvanometer is made into a dc ammeter by connecting

- (a) A low resistance across the meter
- (b) A high resistance in series with meter
- (c) A pure inductance across the meter
- (d) A capacitor in series with the meter

Ans: (a)

2075. The effect of stray magnetic fields on the actuating torque of a portable instrument is maximum when the operating field of the instrument and the stray fields are

- (a) Perpendicular
- (b) Parallel
- (c) Inclined at 60°
- (d) Inclined at 30°

Ans: (b)

2076. Identify the instrument which has no controlling torque

- (a) Electrostatic voltmeter
- (b) Power factor meter
- (c) Watt meter
- (d) Dynamometer type ammeter

Ans: (b)

2077. Megger is used for testing?

- (a) Open circuit only
- (b) Short circuit only
- (c) Open circuits, short circuits, earth resistance and insulation
- (d) Low resistances

Ans: (C)

2078. Pick the odd instrument out

- (a) Moving iron meter
- (b) Moving coil meter
- (c) Dynamometer wattmeter
- (d) Watt-hour meter

Ans: (d)

2079. A meter has a full scale deflection of 90° at a current of I_A . The response of the meter is square law. Assuming spring control, the current for a deflection at 45° will be

- (a) 0.25
- (b) 0.50
- (c) 0.707
- (d) 0.67

Ans: (c)

2080. In current transformers turns compensation is provided mainly to reduce the

- (a) Both ratio and phase angle errors
- (b) Phase angle error
- (c) Ratio error
- (d) Power losses

Ans: (c)

2081. PMMC type instrument normally use

- (a) No damping is required
- (b) Fluid-friction damping

- (c) Eddy current damping
- (d) Air-friction damping

Ans: (c)

2082. What will happen if a voltmeter is connected like an ammeter in series to the load?

- (a) There will be almost no current in the circuit
- (b) The measurement will be too high
- (c) An inadmissibly high current will flow
- (d) The meter will bum out

Ans: (a)

2083. Moving iron instruments can be used on

- (a) High frequency supply
- (b) DC only
- (c) Measure AC and DC
- (d) AC only

Ans: (c)

2084. The instrument whose deflection is given by the equation $\Theta \propto I^2 \frac{dM}{d\Theta}$ is known as

- (a) electrodynamic type
- (b) repulsion type
- (c) electrostatic type
- (d) attraction type

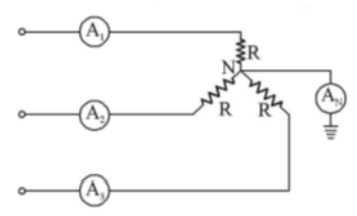
Ans: (a)

2085. Swamping resistance is added to the coil circuit

- (a) To increase the sensitivity
- (b) To reduce the temperature error
- (c) To reduce the error due to thermal emf
- (d) To reduce the power drawn by the instrument

Ans: (b)

2086. In the circuit shown in the given figure, three phase supply is connected to a star connected load. If ammeters A₁, A₂, A₃ read 12.5 A, what will be the reading of ammeter A_N



- (a) 37.5 A
- (b) $1/\sqrt{3}$ A
- (c) $37.5\sqrt{3}$ A
- (d) Zero

Ans: (d)

2087. An integrating digital voltmeter measures

- (a) True average value
- (b) RMS value
- (c) Peak value
- (d) Peak to peak value

Ans: (a)

2088. The scale of a voltmeter is uniform. Its type is

- (a) Moving iron
- (b) Induction
- (c) Moving coil permanent magnet
- (d) Moving coil dynamometer

Ans: (c)

2089. Wire wound resistors are unsuitable for use at high frequencies because

- (a) They are likely to melt under excessive eddy current
- (b) They exhibit unwanted inductive and capacitive effects
- (c) They create more electrical noise
- (d) They consume more power

Ans: (b)

2090. A 35 V DC supply is connected across a combined resistance of 600Ω and an unknown resistance of $R\Omega$ in series. If a voltmeter having a resistance of $1.2k\Omega$ is connected across 600Ω resistor and reads 5V, then what is the value of the resistance R

- (a) 120Ω
- (b) 500Ω
- (c) 1.7Ω
- (d) $2.4 k\Omega$

Ans: (d)

2091. A resistance is measured by the voltmeter ammeter method. The voltmeter reading is 50 V on 100 V scale and ammeter reading is 50 mA on 100 mA scale. If both the meters are guaranteed for accuracy with 2% of full scale, what is the limit within resistance that can be measured?

- (a) 10Ω
- (b) 20Ω
- (c) 40Ω
- (d) 80Ω

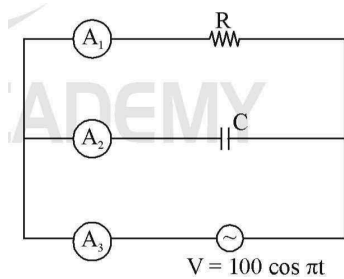
Ans: (d)

2092. Assertion (A): In general, moving non voltmeters are less accurate than those of the dynamometer type. Reason (R): Moving iron voltmeters often use air-friction damping.

- (a) Both A and R are individually true and R is the correct explanation of A.
- (b) Both A and R are individually true and R is not the correct explanation of A
- (c) A is true but R is false
- (d) A is false but R is true

Ans: (b)

- 2093.** In the figure shown below A_1 , A_2 and A_3 are ideal ammeters. If A_2 and A_3 read 4A and 5A respectively, what is the reading of A_1 ?



- (a) 1 A
- (b) 3 A
- (c) 9 A
- (d) Cannot be calculated without the values of R and C

Ans: (b)

- 2094.** If two 300V full-scale voltmeters V_1 and V_2 having sensitivity of $100\text{k}\Omega/\text{V}$ and $150\text{k}\Omega/\text{V}$ respectively are connected in series to measure 500 V, then

- (a) V_1 and V_2 will read 250 V each
- (b) V_1 will read 200 V and V_2 will read 300 V
- (c) V_1 will read 300 V and V_2 will read 200 V
- (d) V_1 and V_2 will read 0V each

Ans: (b)

- 2095.** An instrument that measures the insulation resistance of system using a self provide 1000 V DC generator is called

- (a) VTVM
- (b) Megger
- (c) Thermocouple instrument
- (d) Multimeter

Ans: (b)

- 2096.** Which one of the following variable cannot be measured directly by a CRO?

- (a) Current
- (b) Voltage
- (c) Phase difference
- (d) Frequency

Ans: (a)

- 2097.** In moving coil meters, damping is provided by

- (a) Eddy current disk
- (b) The aluminium frame of the coil
- (c) Damping vane in the air-tight chamber
- (d) The coil spring attached to the moving mechanism

Ans: (b)

- 2098.** A 2V peak to peak symmetrical wave is given to a rectifier type AC voltmeter. The

voltmeter will read

- (a) 2.22 V
- (b) 1.11 V
- (c) 1 V
- (d) Zero

Ans: (b)

2099. A moving iron instrument has 10Ω resistance and gives a full scale deflection when carrying 50 mA. It can be used to measure 750 V by 500 V, then using a resistance of

- (a) $0.005002\ \Omega$ in series
- (b) $0.005002\ \Omega$ in parallel
- (c) 14990Ω in series
- (d) 14990Ω in parallel

Ans: (c)

2100. In eddy current damping systems, the disc employed should be of

- (a) Conducting and magnetic material
- (b) Conducting but non magnetic material
- (c) Magnetic but non conducting material
- (d) Non conducting and non magnetic material

Ans: (b)

2101. An analog voltmeter has a sensitivity of $10\text{ k}\Omega/\text{volt}$. The galvanometer used constructing the instrument will produce

- (a) 10 mA
- (b) 20 mA
- (c) 50 mA
- (d) $100\ \mu\text{A}$

Ans: (d)

2102. A 0.1A ammeter having a resistance of 10Ω is to be converted to a 1A ammeter by using shunt resistance. Which one of the following is the most appropriate shunt resistance?

- (a) $0.1\ \Omega$
- (b) $1.0\ \Omega$
- (c) $1.1\ \Omega$
- (d) 1.2Ω

Ans: (c)

2103. For a given frequency, the deflecting torque of an induction ammeter is directly proportional to

- (a) Current^2
- (b) Current^3
- (c) $\sqrt{\text{current}}$
- (d) Current

Ans: (a)

2104. The basic principle of D' Arsonval instrument is the same as the principle of a

- (a) Moving iron instrument

- (b) PMMC instrument
- (c) Induction instrument
- (d) None of these

Ans: (b)

2105. The damping torque in a measuring instrument can be produced by

- (a) Eddy current
- (b) Gravity control
- (c) Electro statically
- (d) Thermally

Ans: (a)

2106. The deflection expression $\Theta \propto V^2 dC/d\Theta$ corresponds to

- (a) Moving iron type instruments
- (b) Electrodynamic type instruments
- (c) Electrostatic type instruments
- (d) Induction type instruments

Ans: (c)

2107. No eddy current and hysteresis losses occur in

- (a) Electrostatic instruments
- (b) PMMC type instruments
- (c) Moving-iron instruments
- (d) Electrodynamometer instruments

Ans: (a)

2108. For increasing the range of voltmeter, connect a

- (a) High value resistance in series with voltmeter
- (b) Low value resistance in series with voltmeter
- (c) High value resistance in parallel with voltmeter
- (d) Low value

Ans: (a)

2109. In a gravity controlled instrument, controlling torque is proportional to

- (a) Θ
- (b) Θ^2
- (c) $\sin\Theta$
- (d) None of these

Ans: (c)

2110. Electrostatic instruments are normally used for

- (a) Low current measurements
- (b) High current measurements
- (c) Low voltage measurements
- (d) High voltage measurements

Ans: (d)

2111. Which instrument has necessarily the 'square law' type scale?

- (a) Permanent magnet moving coil

- (b) Hot wire instruments
- (c) Moving iron repulsion
- (d) None of the above

Ans: (b)

2112. A rectifier instrument is used to measure an alternating square wave of amplitude 100V. What is the meter reading?

- (a) 100 V
- (b) 70.7 V
- (c) 111V
- (d) None of these

Ans: (c)

2113. The materials to be used in the manufacture of a standard resistance should be of

- (a) High resistivity and low temperature coefficient
- (b) Low resistivity
- (c) High temperature coefficient
- (d) Low resistivity and high temperature coefficient

Ans: (a)

2114. An unshielded moving iron voltmeter is used to measure the voltage in an AC circuit. If a stray DC magnetic field having a component along the axis of the meter coil appears, the meter reading would be

- (a) Unaffected
- (b) Decreased
- (c) Increased
- (d) Either decreased or increased depending on the direction of the DC field

Ans: (d)

2115. Which one of the following is basically a current sensitive instrument?

- (a) Permanent magnet moving coil instrument
- (b) Cathode ray oscilloscope
- (c) Electrostatic instrument
- (d) FET input electronic voltmeter

Ans: (a)

2116. Which one of the following types of instruments can be used to determine the r.m.s. value of a.c voltage of high magnitude (10 kV) and of any a.c. wave shape?

- (a) Moving iron instruments
- (b) Dynamometer type instruments
- (c) Induction instruments
- (d) Electrostatic instruments

Ans: (d)

2117. Which one of the following decides the time of response of an indicating instrument ?

- (a) Deflecting system
- (b) Controlling system
- (c) Damping system

(d) Pivot and Jewel bearing

Ans: (c)

2118. A Galvanometer has

- (a) Air friction damping
- (b) Fluid friction damping
- (c) Eddy current damping
- (d) Electromagnetic damping

Ans: (d)

2119. In a permanent magnet moving coil instrument, if the control spring is replaced by another one having a higher spring constant, then the natural frequency and damping ratio will

- (a) Decrease
- (b) Increase and decrease respectively
- (c) Decrease and increase respectively
- (d) Increase

Ans: (b)

2120. Which meter has the highest accuracy?

- (a) PMMC
- (b) Moving iron
- (c) Electrodynamic meter
- (d) Rectifier

Ans: (a)

2121. Rectifier Moving Coil Instruments respond to

- (a) Peak value, irrespective of the nature of the waveform
- (b) Average value, all waveforms
- (c) Rms value for all waveforms
- (d) Rms value, for symmetrical square waveforms

Ans: (b)

2122. An average response rectifier type electronic AC voltmeter has a DC voltage of 10 V applied to it. The meter reading will be

- (a) 7.1 V
- (b) 10.0 V
- (c) 11.1 V
- (d) 22.2 V

Ans: (c)

2123. In a galvanometer, the deflection becomes one half when the galvanometer is shunted by a 20 ohm resistor. The galvanometer resistance is:

- (a) 5 ohm
- (b) 10 ohm
- (c) 40 ohm
- (d) 20 ohm

Ans: (d)

2124. Clamp on ammeter is used for measurement of:

- (a) Large alternating currents
- (b) Small direct currents
- (c) Small alternating currents
- (d) Large direct currents

Ans: (a)

2125. An ammeter has a current range of 0-5 A, and its internal resistance is $0.2\ \Omega$. In order to change the range to 0-25A, what should be the value of resistance added and how it would connect with meter (*i.e.* series/parallel)?

- (a) $(0.05\ \Omega/\text{series})$
- (b) $(0.05\ \Omega/\text{parallel})$
- (c) $(0.20\ \Omega/\text{parallel})$
- (d) $(0.20\ \Omega/\text{series})$

Ans: (b)

2126. The potential transformers Nominal Ratio is defined as the ratio of:

- (a) Primary winding voltage and secondary winding voltage
- (b) Rated primary winding voltage and rated secondary winding voltage
- (c) Primary winding turns and secondary winding turns
- (d) Any of the above

Ans: (b)

2127. The measurement range of an ammeter can be increased by using a:

- (a) High resistance in shunt
- (b) Low resistance in shunt
- (c) High resistance in series
- (d) Low resistance in series

Ans: (b)

2128. A permanent magnet moving coil ammeter has a coil resistance of 99 ohm and Full Scale Deflection (FSD) current of 0.1 mA. Shunt resistance is 1 ohm. Current through the meter at 0.5 F.S.D is:

- (a) 0.007mA
- (b) 0.05mA
- (c) 0.023mA
- (d) None of these

Ans: (b)

2129. A DC ammeter has a resistance of $0.1\ \Omega$ and its currents range is 0-100 A. If the range is to be extended to 0-500 A, then the shunt resistance should be :

- (a) $0.5\ \Omega$
- (c) $0.025\ \Omega$
- (b) $0.25\ \Omega$
- (d) $0.05\ \Omega$

Ans: (c)

2130. Which of the following can be measured by a multimeter?

- (a) Voltage

- (b) Resistance
- (c) Current
- (b) Resistance
- (d) All the above

Ans: (d)

2131. An instrument which detects electric current is known as

- (a) Voltmeter
- (c) Wattmeter
- (b) Rheostat
- (d) Galvanometer

Ans: (d)

2132. What should be the properties and mode of connection of the shunts and multipliers used to increase the ranges of voltmeters and ammeters?

- (a) Shunts - low resistance connected in parallel with ammeters
- (b) Shunts - high resistance, connected in series with ammeters
- (c) Multipliers - low resistance, connected in series with voltmeters
- (d) Multipliers - high resistance, connected in parallel with voltmeters

Ans: (a)

2133. Which of the following statements is not an advantage of Electrodynamic instruments?

- (a) Free from hysteresis errors
- (b) Low power consumption
- (c) Precision grade accuracy
- (d) Low sensitivity

Ans: (d)

2134. Which among the following is not a method for measurement of High Resistance?

- (a) Direct deflection method
- (b) Megaohm method
- (c) Megger
- (d) Loss of current method

Ans: (d)

2135. A Q-meter measures:

- (a) Loss in a capacitor
- (b) Frequency
- (c) Accurate value of electrical quantity
- (d) Properties of the coils

Ans: (d)

2136. The ratio error in current transformer is due to:

- (a) Power factor of primary
- (b) Wattless component of the current in the primary
- (c) Exciting current
- (d) Leakage flux

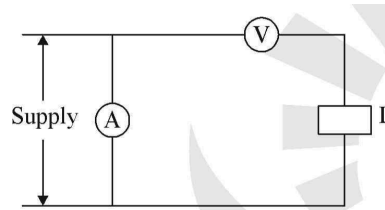
Ans: (c)

2137. The deflection torque can be produced by:

- (a) Gravity control
- (b) Spring control
- (c) Air friction
- (d) Magnetically

Ans: (d)

2138. By mistake voltmeter and ammeter are connected as shown in the figure below:



- (a) Only voltmeter will burn away
- (b) Only ammeter will burn away Load
- (c) Both voltmeter and ammeter will burn away
- (d) None will burn away

Ans: (b)

2139. If 2% of main current is to be passed through a moving coil galvanometer of resistance G ; the resistance of shunt required is

- (a) $G/49$
- (c) $49G$
- (b) $G/50$
- (d) 500

Ans: (a)

2140. Under operating conditions the secondary of CT is always short circuited because

- (a) It protects the primary circuit
- (b) It is safe to human beings
- (c) It avoids core saturation and HV induction
- (d) All the above

Ans: (b)

2141. The most efficient form of damping employed in electric instruments is

- (a) Air friction damping
- (b) Fluid friction damping
- (c) Eddy current damping
- (d) None of the above

Ans: (c)

2142. Which of the following instruments is equally accurate on ac as well as dc circuits?

- (a) PMMC voltmeter
- (b) Dynamometer wattmeter
- (c) Moving iron ammeter
- (d) Induction wattmeter

Ans: (b)

2143. The moving system of an indicating type of electrical instrument is subjected to

- (a) A deflecting torque
- (b) A controlling torque
- (c) A damping torque
- (d) All of the above

Ans: (d)

2144. The type of instruments used mainly for standardizing instruments in laboratories is

- (a) Indicating instrument
- (b) Integrating instrument
- (c) Absolute instrument
- (d) Recording instrument

Ans: (c)

2145. Series resistance required to read 0-250 V with a moving coil instrument of internal resistance 2 ohm and full scale deflection of 50 mA is

- (a) 49998 Ω
- (b) 4998 Ω
- (c) 498 Ω
- (d) 49.8 Ω

Ans: (b)

2146. Which of the following is not a method of resistance measurement?

- (a) Ammeter - Voltmeter method
- (b) Post - Office box method
- (c) Ohm - Meter method
- (d) Two wattmeter method

Ans: (d)

2147. Internal resistance of a micro-ammeter is 500 ohm. Shunt resistance required to increase its range from 0-100 μ A to 0-10 A will be approximately

- (a) 0.05 Ω
- (b) 0.005 Ω
- (c) 0.5 Ω
- (d) 5.0 Ω

Ans: (b)

2148. In a particular meter, the deflecting torque is directly proportional to the current flowing through it, the type of meter is

- (a) Moving coil
- (c) Induction
- (b) Moving iron
- (d) Electro-static

Ans: (a)

2149. Megger is used to measure

- (a) Very high resistance or insulation resistance

- (b) Low resistance
- (c) High resistance
- (d) Very low resistance

Ans: (a)

2150. A null type of instrument as compared to a deflecting type instrument has

- (a) Higher accuracy
- (b) Lower sensitivity
- (c) Faster response
- (d) All of the above

Ans: (a)

2151. The sensitivity of a voltmeter using 0-5 mA meter movement is

- (a) 200 Ω/V
- (b) 150 Ω/V
- (c) 100 Ω/V
- (d) 50 Ω/V

Ans: (a)

2152. Moving coil instruments have which one of the following scales?

- (a) Logarithmic scale
- (b) Uniform scale
- (c) Non-uniform scale
- (d) Squared scale

Ans: (b)

2153. The material of hair spring used in measuring instruments is made of which of material of the following:

- (a) Copper
- (b) Bronze
- (c) Alnico
- (d) None of these

Ans: (b)

2154. Ballistic galvanometer is calibrated to measure:

- (a) Current
- (b) Voltage
- (c) Resistance
- (d) Charge

Ans: (d)

2155. Voltmeter has

- (a) Low resistance
- (b) High resistance
- (c) Infinite resistance
- (d) Zero resistance

Ans: (b)

2156. Which of the following is not a requirement for a DC ammeter's shunt?

- (a) High thermal automotive force
- (b) Time-invariant
- (c) Low temperature coefficient
- (d) Carry current without excessive temperatures

Ans: (a)

2157. Scale of Moving Iron instruments is:

- (a) Linear
- (b) Non-uniform
- (c) Exponential
- (d) Logarithmic

Ans: (b)

2158. Which of the following is not a type of operating force in Electromechanical Indicating Instrument?

- (a) Deflecting force
- (b) Controlling force
- (c) Damping force
- (d) Gravitational force

Ans: (d)

2159. Which of the following is an Integrating instrument?

- (a) Watt-hour meter
- (b) Ammeter
- (c) Voltmeter
- (d) Wattmeter

Ans: (a)

2160. In PMMC instruments, torque/deflection produced in the coil is ___current flowing through it.

- (a) Directly proportional
- (b) inversely proportional
- (c) Directly proportional to the square of
- (d) Inversely proportional to the square of

Ans: (a)

2161. Electrostatic instrument measures:

- (a) DC and AC voltage only
- (b) DC and AC current only
- (c) DC and AC current and voltage both
- (d) DC voltage only

Ans: (a)

2162. An ammeter has a current range of 0-5A and its internal resistance is 0.4Ω . In order to change the range to 0-50 A, we need to add a resistance of

- (a) 0.4Ω in series with the meter
- (b) 1.0Ω in series with the meter

- (c) $0.044\ \Omega$ in parallel with the meter
- (d) $0.055\ \Omega$ in parallel with the meter

Ans: (c)

2163. A galvanometer has sensitivity of 50 and has a resistance of $100\ \Omega$. The multiplying power (the ratio of measured current to galvanometer current) of $10\ \Omega$ shunt with this galvanometer is

- (a) 11
- (b) 100
- (c) 110
- (d) 10

Ans: (a)

2164. An average-reading meter reads 20V when fed with a triangular wave, symmetric about the timeaxis. For the same input an rms-reading meter will read:

- (a) 40 V
- (b) 23.09 V
- (c) 20 V
- (d) 10.5 V

Ans: (b)

2165. A moving coil of a meter has 400 turns and a length and depth of 20 mm and 20 mm respectively. It is positioned in a uniform radial flux density of 200 mT. The coil carries a full scale current of 25 mA. The torque on the coil is ----- and sensitivity is-----

- (a) $800\ \mu\text{Nm}$, $40\ \Omega/\text{V}$
- (b) $800\ \mu\text{Nm}$, $25\ \Omega/\text{V}$
- (c) $200\ \mu\text{Nm}$, $100\ \Omega/\text{V}$
- (d) $800\ \mu\text{Nm}$, $1\ \Omega/\text{V}$

Ans: (a)

2166. With a multiplier setting of $30\ \text{k}\Omega$, it reads 400V and with a multiplier setting of $80\ \text{k}\Omega$, it reads 250 V For a multiplier setting of $20\ \text{k}\Omega$, the voltmeter reads

- (a) 371 V
- (b) 483 V
- (c) 437.5 V
- (d) 455 V

Ans: (d)

2167. A permanent magnet moving coil ammeter has a coil resistance of 99 ohm and Full Scale Deflection (FSD) current of 0.6 mA with shunt resistance of 1 ohm. Current through the meter at 0.5 F.S.D. is

- (a) 0.007 mA
- (b) 0.05 mA
- (c) 0.3 mA
- (d) 0.01 mA

Ans: (c)

2168. A current of $10 + 6 \sin(\omega t + 30^\circ)\text{A}$ is passed through two meters. They are a PMMC meter and a moving iron instrument. The respective reading (in A) will be

- (a) 10A and 10A
- (b) 10A and 16A
- (c) 10A and 10.86A
- (d) 0A and 6 A

Ans: (c)

2169. A PMMC voltmeter is connected across a series combination of DC voltage source $V_1 = 12 \text{ V}$ and AC voltage source $V_2(t) = 9 \sin(4t) \text{ V}$ The meter reads:

- (a) 13 V
- (b) 15 V
- (c) 12 V
- (d) 7.5 V

Ans: (c)

2170. Which part/phenomenon controls the controlling torque in megger?

- (a) Earthing
- (c) Spring
- (b) Leakage current
- (d) Coil

Ans: (d)

2171. Which instrument has the multiple shunt or series resistances inside the meter?

- (a) Moving coil galvanometer
- (b) Multimeter
- (c) Multirange meter
- (d) Wattmeter

Ans: (c)

2172. Of what material, swamping resistance is made up?

- (a) Alloy of nickel and cobalt
- (b) Alloy of manganin and aluminium
- (c) Alloy of manganin and copper
- (d) None of these

Ans: (c)

2173. Alternating current is measured by

- (a) Induction ammeter
- (b) Electrostatic ammeter
- (c) Moving iron repulsion type voltmeter
- (d) Permanent magnet ammeter

Ans: (a)

2174. In a 3-phase dynamometer type power factor meter, two moving coil planes are inclined at an angle of

- (a) 180°
- (b) 120°
- (c) 90°
- (d) 45°

Ans: (b)

2175. The insulation resistance test is carried out by the instrument

- (a) Ammeter
- (b) Voltmeter
- (c) Megger
- (d) Energymeter

Ans: (c)

2176. Which of the following type of instrument is used only for D.C?

- (a) Moving iron-attraction type
- (b) Moving iron-repulsion type
- (c) Permanent magnet type
- (d) Hot wire type

Ans: (c)

2177. Which of the following is not an Integrating instrument?

- (a) Ampere hour meter
- (b) Watt hour meter
- (c) Volt meter
- (d) None of these

Ans: (c)

2178. Hot wire ammeters are used for measuring:

- (a) Only AC
- (b) Only DC
- (c) Neither AC nor DC
- (d) Both AC and DC

Ans: (d)

2179. Rectifier type instrument can be use in

- (a) AC
- (b) DC
- (c) Both (a) and (b)
- (d) Pulsating

Ans: (a)

2180. Induction type instrument can be employed for

- (a) Alternating Currents only
- (b) Direct Current only
- (c) AC and DC both
- (d) Usually DC for heavy currents

Ans: (a)

2181. A 0 to 300V voltmeter has guaranteed accuracy of 1 % full scale reading. The voltage measured by the instrument is 83 V. The percent limiting error Is:

- (a) 0.95
- (b) 1.81
- (c) 3.62

(d) 4.85

Ans: (c)

2182. A 300 V voltmeter has an accuracy of $\pm 2\%$ of full scale deflection. When the reading is 222 V, the actual voltage:

(a) Lies between 217.56 and 226.44 V

(b) Lies between 217.4 and 226.6 V

(c) Lies between 216 and 228 V

(d) Is exact 222 V

Ans: (c)

2183. A 0-200 V voltmeter has an accuracy of 0.75% of full scale reading. If voltage measured is 100V, the error is:

(a) 3%

(b) 2%

(c) 1.5%

(d) 0.75%

Ans: c

2184. An instrument has sensitivity of 1000 ohms/volt on the 100 volt scale. The instrument will have internal resistance of

(a) 10 ohms

(b) 10000 ohms

(c) 1000 ohms

(d) 100000 ohms

Ans: (d)

2185. Strike out the features not to be associated with the rectifier instruments

(a) Small power loss

(b) High degree of measuring accuracy

(c) High sensitivity

(d) None of these

Ans: (d)

2186. A meter having a sensitivity of 2 k Ω /V is used for the measurement of voltage across a circuit having an output resistance of 1 k Ω and an open circuit voltage of 8V. What is the reading of the meter at its 10V scale?

(a) 5.72 V

(b) 6.51 V

(c) 7.62 V

(d) 7.91 V

Ans: (c)

2187. Swamp resistance and condenser are used

(a) To reduce the error while measuring DC quantities in a moving iron instrument

(b) To reduce the error while measuring AC quantities in a moving iron instrument

(c) To reduce the error while measuring DC quantities in a moving coil instrument

(d) None of the above

Ans: (b)

- 2188.** A PT is a device which is :
- (a) Electrostatically coupled
 - (b) Electrically coupled
 - (c) Electromagnetically coupled
 - (d) Conductively coupled

Ans: (c)

- 2189.** The current and potential transformers are used to measure the:
- (a) Low current and low voltage
 - (b) High current and low voltage
 - (c) High voltage and low current
 - (d) High current and high voltage

Ans: (d)

- 2190.** A PMMC meter can be used as an ammeter using:
- (a) Series resistors
 - (b) Shunt inductors
 - (c) Shunt resistors
 - (d) Series inductors

Ans: (c)

- 2191.** Moving iron type instruments are used for measurement of:
- (a) Earth resistance
 - (b) Only alternating currents and voltages
 - (c) Alternating, direct currents and voltages
 - (d) Only direct currents and voltages

Ans: (c)

- 2192.** Which of the following instruments is generally used for measuring d.c. current:
- (a) M.C. Type
 - (b) M.I. type
 - (c) Dynamometer type
 - (d) Induction type

Ans: (a)

- 2193.** A spring controlled moving iron voltmeter draws a current of 1 mA for full scale value of 100 V. If it draws a current of 0.5 mA, the meter reading is:
- (a) 25 V
 - (b) 50 V
 - (c) 100 V
 - (d) None of these

Ans: (a)

- 2194.** In the below given deflecting torque equation 'B' indicates $T_d = B \cdot I \cdot N \cdot A$
- (a) Constant
 - (b) Flux Density
 - (c) Current flowing throughout the meter

(d) Number of turns in the coil

Ans: (b)

2195. Eddy current damping can not be used for moving iron instrument because:

- (a) The weight of the instrument will increase
- (b) The presence of permanent magnet required for this purpose will affect the deflection and the instrument reading
- (c) The size of instrument will increase
- (d) Eddy current will pass through iron and thereby cause loss

Ans: (b)

2196. In PMMC instruments, damping is provided by:

- (a) The coil itself
- (b) Separate pair of magnets
- (c) An aluminium frame on which the coil is wound
- (d) Damping vane in an air tight chamber

Ans: (c)

2197. Two 100 V full scale PMMC type DC voltmeter having Figure of Merits (FOM) of 10 k Ω /V and 20k Ω /V are connected in series. The series combination can be used to measure a maximum DC voltage of:

- (a) 200 V
- (b) 100 V
- (c) 150 V
- (d) 300 V

Ans: (c)

2198. A linear scale used in

- (a) Thermocouple meters
- (b) Moving iron meters
- (c) Hotwire meters
- (d) None of these

Ans: (d)

2199. PMMC (D' Arsonval) is used for

- (a) AC current
- (b) DC voltage
- (c) AC voltage
- (d) All of the above

Ans: (b)

2200. Which meter has the highest accuracy in the prescribed limit of frequency range

- (a) Rectifier
- (b) Electrodynamometer
- (c) PMMC
- (d) Moving iron

Ans: (b)

2201. In ___instruments the deflecting torque depends on the frequency

- (a) Induction type instruments
- (b) Hot wire instruments
- (c) Moving iron instruments
- (d) Moving coil instruments

Ans: (a)

2202. A moving coil instrument, having coil resistance of $4.5\ \Omega$ gives a full scale deflection of 30 mA.

The resistance connected in parallel with this instrument to read up to 2.5 A is

- (a) $6.46\ \Omega$
- (b) $0.0346\ \Omega$
- (c) $0.0546\ \Omega$
- (d) $0.0625\ \Omega$

Ans: (c)

2203. In a particular meter, the operating torque is directly proportional to the current passing through it, then the type of meter is

- (a) Moving iron
- (b) Moving coil
- (c) Electrostatic
- (d) Induction

Ans: (b)

2204. What is a Weston frequency meter?

- (a) Moving coil instrument
- (b) Moving iron instrument
- (c) Dynamometer type instrument
- (d) Induction instrument

Ans: (b)

2205. Following is not an advantage of a permanent magnet moving coil instrument

- (a) It has a uniform scale
- (b) It can be used without error for a long period
- (c) It has good damping torque
- (d) Its range can be easily extended

Ans: (b)

2206. If a galvanometer is sensitive, it will provide large deflection on providing

- (a) No current
- (b) Large power
- (c) Small current
- (d) Large voltage

Ans: (c)

2207. Which of the following statements is not an advantage of Electrodynamometric instruments?

- (a) Free from hysteresis errors
- (b) Low power consumption
- (c) Low accuracy
- (d) Low sensitivity

Ans: (d)

2208. In an attraction type moving Iron instrument, the damping torque is usually provided by

- (a) Air friction damping
- (b) Eddy current damping
- (c) Fluid friction damping
- (d) Capacitive damping

Ans: (a)

2209. Damping torque in measuring instruments provided by Fluid friction damping is mainly used

- (a) Where low magnetic fields are produced
- (b) Where high magnetic fields are produced
- (c) Where deflecting torque is minimum
- (d) Where permanent magnet produces the required deflecting torque

Ans: (c)

2210. Deflecting torque is __quantity under measurement in PMMC instruments.

- (a) Directly proportional to
- (b) Inversely proportional to
- (c) Directly proportional to square of
- (d) Inversely proportional to square of

Ans: (a)

2211. Identify the instrument which has no controlling torque

- (a) Electrostatic Voltmeter
- (b) Power factor meter
- (c) Watt meter
- (d) Dynamometer type Ammeter

Ans: (b)

2212. PMMC meter is fitted in

- (a) Ammeter
- (b) Voltmeter
- (c) Multimeter
- (d) Wattmeter

Ans: (c)

2213. Deflection produced in moving iron instruments is :

- (a) Proportional to rms value of operating current
- (b) Proportional to square of rms value of operating current
- (c) Inversely proportional to rms value of operating current
- (d) Inversely proportional to square of rms value of operating current

Ans: (b)

2214. Damping of deflecting type instruments is done to

- (a) Reduce the oscillation of the pointer in the final deflected position
- (b) Make the moving system slow
- (c) Make the moving system fast
- (d) Reduce the angle of deflection of the pointer on the graduated scale

Ans: (a)

2215. A moving iron instrument gives correct reading when used at-

- (a) Low frequency
- (b) High frequency
- (c) Only one frequency
- (d) All frequencies to a certain value

Ans: (c)

2216. In a portable instrument, the controlling torque is provided by :

- (a) Spring
- (b) Gravity
- (c) Eddy currents
- (d) Damping friction

Ans: (a)

2217. PMMC ammeter have uniform scale because:

- (a) Of eddy current damping
- (b) They are spring controlled
- (c) Their deflecting torque varies directly as current
- (d) Both spring controlled and having deflecting torque varies directly as current

Ans: (d)

2218. The instrument transformers are normally used to extend the range of

- (a) Induction instruments
- (b) Electrostatic instruments
- (c) Moving iron instruments
- (d) All of these

Ans: (c)

2219. A moving-coil permanent-magnet instrument can be used as _____ by using a low resistance shunt

- (a) Voltmeters
- (b) Ammeters
- (c) Ohmmeters and resistance bridges
- (d) All of these

Ans: (b)

2220. If the secondary burden of a current transformer is 15 VA and secondary current is 5 A, then the impedance of the connected load will be:

- (a) 0.6Ω
- (b) 5Ω
- (c) 6Ω
- (d) 10Ω

Ans: (a)

2221. An ammeter is convertible to a voltmeter by:

- (a) Changing the scale
- (b) Putting a large resistance in parallel with the actual measuring part of

the instrument

- (c) Putting large resistance in series with the actual measuring part of the instrument
- (d) Simply installing the instrument in parallel with the circuit

Ans: (c)

2222. If an ammeter & a capacitor are connected in series on DC circuit the ammeter will:

- (a) Give continuous reading
- (b) Initially give & then will come to zero
- (c) Not give any reading
- (d) Give only half the reading

Ans: (b)

2223. A 1 mA D' Arsonval movement has resistance of 100Ω . It is to be converted to a 10 V voltmeter. The value of multiplier resistance is

- (a) 999Ω
- (b) 9999Ω
- (c) 9900Ω
- (d) 990Ω

Ans: (c)

2224. A meter movement with current sensitivity $100\mu\text{A}$ and internal resistance 100Ω is required to measure current of 10 mA. What will the shunt resistance be equal to?

- (a) 1Ω
- (b) 0.98Ω
- (c) 0.99Ω
- (d) 1.010101Ω

Ans: (d)

2225. The deflecting torque of an Ammeter is directly proportional to the current passing through it and the instrument has full scale deflection of 90 degree for a current of 10 A. What deflection will occur for a current for a current of 5 A when the instrument has gravity control?

- (a) 30°
- (b) 45°
- (c) 60°
- (d) 90°

Ans: (a)

2226. Two voltmeters have the same range 0-400 V The internal impedance are $30\text{ k}\Omega$ and $20\text{ k}\Omega$. If they are connected in series and 600 V be applied across them, the readings are:

- (a) 360 V and 240 V
- (b) 300 V each
- (c) 400 V and 200 V
- (d) Out of range for one of the meters and 100 V for the other

Ans: (a)

2227. DC probes are generally used with a voltmeter to:

- (a) Decrease its range
- (b) Increase its range
- (c) Frequency independent
- (d) None of these

Ans: (a)

2228. A galvanometer may be converted into ammeter or voltmeter. In which of the following cases the resistance of the device will be the largest?

- (a) An ammeter of range 10 A
- (b) A voltmeter of range 5 V
- (c) An ammeter of range 5 A
- (d) A voltmeter of range 10 V

Ans: (d)

2229. For a 1000 μA movement with 100 ohms R_m , in voltage V_m at Full scale deflection is

- (a) 250 μV
- (b) 0.1 V
- (c) 0.2 V
- (d) 0.5 V

Ans: (b)

2230. Voltmeter sensitivity is defined by:

- (a) V/Ω
- (b) V/Ω^2
- (c) Ω/V
- (d) Ω/V^2

Ans: (c)

2231. When the DC voltmeter is connected polarities reversed

- (a) The pointer deflects upscale
- (b) The pointer deflects downscale
- (c) The pointer remains stationary
- (d) None of these

Ans: (b)

2232. Ammeters are always connected in __

- (a) Series
- (b) Parallel
- (c) Either (a) or (b)
- (d) None of these

Ans: (a)

2233. An accurate voltmeter must have an internal impedance of

- (a) very low value
- (b) low value
- (c) very high value
- (d) zero

Ans: (c)

2234. A voltmeter must have a very high internal resistance so that the:

- (a) Accuracy is high
- (b) Resolution is high
- (c) Meter draws minimum current
- (d) Loading is maximum

Ans: (c)

2235. To convert a galvanometer into voltmeter, the value and type of connection of the resistance to be connected with should be

- (a) Low and parallel
- (b) High and parallel
- (c) Low and series
- (d) High and series

Ans: (d)

2236. Two ammeters A and B both 0-10 A have internal resistance of 1Ω and 0.5Ω respectively. They are connected in parallel. If total current is 15 A, then

- (a) $I_A = I_B = 7.5$ A
- (b) $I_A = 5$ A, $I_B = 10$ A
- (c) $I_A = 10$ A, $I_B = 5$ A
- (d) $I_A = 9$ A, $I_B = 6$ A

Ans: (b)

2237. The resistance of a voltmeter and Ammeter is Respectively

- (a) Low and High
- (b) High and High
- (c) High and Low
- (d) Low and Low

Ans: (c)

2238. A 0-15 V voltmeter has a resistance of 1000Ω , if it is desired to expand its range to 0-150 V a resistance of _____ is connected in series with it.

- (a) 3 k Ω
- (b) 5 k Ω
- (c) 9 k Ω
- (d) 2 k Ω

Ans: (c)

2239. The internal resistance of a voltmeter is 20,000 ohms. If this voltmeter is connected in series with a resistance and a 220 volt supply is connected across the combination, the voltmeter reads 200 volts. The value of the resistance is

- (a) 200 Ω
- (b) 4000 Ω
- (c) 2000 Ω
- (d) 20,000 Ω

Ans: (c)

- 2240.** What will happen if a voltmeter is connected like an ammeter in series of the load?
- (a) The meter will burn out
 - (b) The measurement will be too high
 - (c) The same current will flow as would have been with ammeter in circuit
 - (d) There will be almost no current in the circuit

Ans: (d)

- 2241.** Internal resistance of an ideal ammeter is-

- (a) Zero
- (b) Infinite
- (c) Small
- (d) Big

Ans: (a)

- 2242.** A voltmeter is used

- (a) To measure current
- (b) In series with the circuit
- (c) In parallel with the circuit
- (d) To measure coulombs

Ans: (c)

- 2243.** 184. A 10 mA ammeter has a resistance of 50 ohms. It is to be converted to a 1A ammeter. The value of shunt resistance should be :

- (a) 5Ω
- (b) 0.1Ω
- (c) 0.505Ω
- (d) 0.05Ω

Ans: (c)

- 2244.** Which one of the following is used to measure direct current?

- (a) Voltmeter
- (b) Ammeter
- (c) Pyrometer
- (d) Coupler

Ans: (b)

- 2245.** A galvanometer (G) measures upto 100 mA current. It is to be converted to voltmeter to measure upto 100 volts. What is required to be done?

- (a) Add 100Ω resistance in series with G
- (b) Add 1000Ω resistance in series with G
- (c) Add 1Ω resistance in parallel with G
- (d) Add 0.1Ω resistance in parallel with G

Ans: (b)

- 2246.** Assertion (A): Shunt of an ammeter has a low resistance. Reason (R): Shunt may be connected in series or in parallel with ammeter

- (a) Both A and R are true and R is correct explanation of A
- (b) Both A and R are true, but R is not correct explanation of A

- (c) A is true, R is false
- (d) A is false, R is true

Ans: (c)

2247. The internal resistance of the milliammeter must be very low for

- (a) High accuracy
- (b) High sensitivity
- (c) Minimum effect on the current in the circuit
- (d) Maximum voltage drop across the meter

Ans: (c)

2248. A precision current shunt is measuring 200 mV across it and also indicates a current of 30 A. What is the actual resistance of this shunt?

- (a) 0.006Ω
- (b) 0.3Ω
- (c) 30Ω
- (d) 6Ω

Ans: (a)

2249. The value of resistance in a potential divider arrangement to convert a basic d Arsonval meter movement with an internal resistance of 100Ω a full scale current of 1 mA to a multi- range DC voltmeter with ranges 0-150 V and 0-300 V are:

- (a) 149.5 k Ω , 155.5 k Ω
- (b) 144.9 k Ω , 140 k Ω
- (c) 135.5 k Ω , 134 k Ω
- (d) 149.9 k Ω , 150 k Ω

Ans: (d)

2250. The operating magnetic field in an electrodynamic meter type of instrument has a flux density typically about

- (a) 1 Wb/m²
- (b) 0.5 Wb/m²
- (c) 0.05 Wb/m²
- (d) 0.005 Wb/m²

Ans: (d)

2251. In a single phase induction meter, in order to obtain true value of energy, the shunt magnetic flux should lag behind the applied voltage by

- (a) 0°
- (b) 45°
- (c) 90°
- (d) 180°

Ans: (c)

2252. Laboratory wattmeters are:

- (a) Induction type
- (b) Moving type

- (c) Electrostatic type
- (d) Electrodynamo meter type

Ans: (d)

2253. In two wattmeter method of measurement of three-phase power of a balanced load, if both wattmeters indicate the same reading then the power factor of the load is

- (a) 0.5 lagging
- (b) Less than 0.5 lagging
- (c) Unity
- (d) Greater than 0.5 lagging

Ans: c

2254. In two wattmeter method of 3-phase power measurements, when the power factor is 0.5

- (a) The readings of the two wattmeters are equal and positive
- (b) The readings of the two wattmeters are equal and opposite
- (c) The total power is measured by only one wattmeter
- (d) The readings of the

Ans: (c)

2255. In a dynamometer wattmeter, the moving coil is the

- (a) Current coil
- (b) Low p.f. coil
- (c) Potential coil
- (d) Compensating coil

Ans: (c)

2256. It is required to measure pf of an electrical load. No power factor meter is available. The following combination is used to determine pf

- (a) A wattmeter
- (b) A voltmeter and ammeter
- (c) A voltmeter, ammeter and wattmeter
- (d) A kWh meter

Ans: (c)

2257. Electrolytic meter is basically a/an

- (a) DC ampere-hour meter
- (b) DC watt hour meter
- (c) AC energy meter
- (d) AC ampere-hour meter

Ans: (a)

2258. The minimum number of wattmeter(s) required to measure 3-phase, 3-wire balanced or unbalanced power is

- (a) 1
- (b) 2
- (c) 3
- (d) 4

Ans: (b)

2259. In the two-wattmeter method of 3-phase power measurement of a balanced load, one of the wattmeters reads negative. It may be concluded that the p.f. of the load is

- (a) Zero
- (b) 0.5
- (c) Less than 0.5
- (d) Greater than 0.5

Ans: c

2260. The minimum number of wattmeters required to measure 3-phase power is

- (a) 0
- (b) 2
- (c) 4
- (d) 3

Ans: (b)

2261. The functioning of compensating winding in the dynamometer type wattmeter is to neutralize the error due to

- (a) Voltage in the pressure coil circuit
- (b) Power loss in the pressure coil circuit
- (c) The current in the current coil circuit
- (d) Power loss in the current coil circuit

Ans: (b)

2262. Creep occurs in 1Φ energy meters when is energized and it is mainly because of for friction.

- (a) Current-coil, over-compensation
- (b) Pressure-coil, over-compensation
- (c) Pressure-coil, under-compensation
- (d) Current-coil, under-compensation

Ans: (b)

2263. Creeping in energy meters can be prevented by

- (a) Using extra turns of the voltage coils
- (b) Having two holes on opposite sides of the disc
- (c) Using a stronger brake magnet
- (d) Using steel laminations of high permeability

Ans: (b)

2264. Two wattmeters connected to measure the power in a 3-phase balanced delta connected load read $W_1=12$ kW and $W_2=15$ kW respectively. If the same load is reconnected in star, then the wattmeters would read

- (a) $W_1 = 8.66$ kW, $W_2 = 6.93$ kW
- (b) $W_1 = 6.93$ kW, $W_2 = 8.66$ kW
- (c) $W_1 = 5$ kW, $W_2 = 4$ kW
- (d) $W_1 = 4$ kW, $W_2 = 5$ Kw

Ans: (d)

2265. One of the two wattmeters has read zero in the two -wattmeters method of power measurement. This indicated that the load p.f. angle is

- (a) 0°

- (b) 30°
- (c) 60°
- (d) 90°

Ans: (c)

- 2266.** If an induction type energy meter runs fast, it can be slowed down by adjusting the
- (a) Lag
 - (b) Light load
 - (c) Position of braking magnet and making it move closer to the center of the disc
 - (d) Position of braking magnet and making it move away from the center of the disc

Ans: (d)

- 2267.** In a low power-factor wattmeter, compensating coil is employed in order to
- (a) Neutralize the capacitance effect of pressure coil
 - (b) Compensate for the inductance of pressure coil
 - (c) Compensate for the error caused by power loss in the pressure coil
 - (d) Reduce the error caused by the eddy currents

Ans: (c)

- 2268.** Which one of the following causes the disc in an induction type of energy meter to rotate in the opposite direction?
- (a) The braking magnet is faulty
 - (b) Both current coil and voltage coil are wrongly connected
 - (c) Either current coil or voltage coil is wrongly connected
 - (d) The load is highly reactive

Ans: (c)

- 2269.** In the case of power measurement by the watt meter method in a balanced three phase system with a pure inductive load.
- (a) Both the wattmeters will indicate the same value but of opposite sign
 - (b) Both the wattmeters will indicate zero
 - (c) Both the wattmeters will indicate the same value and of the same sign
 - (d) One the wattmeters will indicate zero and the other show non-zero value

Ans: (a)

- 2270.** The current and potential coils of a wattmeter were accidentally interchanged while connecting. After energizing the circuit it was observed that the wattmeter did not show the reading. What could this be due to
- (a) Damage to potential coils only
 - (b) Damage to current coils only
 - (c) Damage to both potential and current coils
 - (d) Losses contact

Ans: (b)

- 2271.** A wattmeter will read zero under the following condition
- (a) The voltage and current are exactly in phase

- (b) The voltage and current have the same time periods but the voltage is sinusoidal whereas the current is a square wave
- (c) The voltage frequency is twice the current frequency
- (d) The current is DC and the voltage is sinusoidal

Ans: (d)

2272. The phenomena of 'creeping' occurs in

- (a) Ammeters
- (b) Voltmeters
- (c) Wattmeters
- (d) Watt-hour meters

Ans: (d)

2273. In a single-phase power factor meter, the controlling torque is

- (a) Provided by spring control
- (b) Provided by gravity control
- (c) Provided by stiffness of suspension
- (d) Not required

Ans: (d)

2274. In an electrodynamic type wattmeter, the inductance of the pressure coil produces error. The error is

- (a) Constant irrespective of the power factor of the load
- (b) Higher at higher power factor loads
- (c) Higher at lower power factor loads
- (d) Highest at unity power factor loads

Ans: (c)

2275. The moving coil in a dynamometer wattmeter is connected

- (a) In series with the fixed coil
- (b) Across the supply
- (c) In series with the load
- (d) Across the load

Ans: (b)

2276. Which one of the following defects is responsible for creeping in an induction type energy meter?

- (a) Imperfect lag compensation
- (b) Over friction compensation
- (c) Imperfect overload compensation
- (d) Misalignment of brake magnet

Ans: (b)

2277. The voltage coil of a single-phase house service energy meter

- (a) Is highly resistive
- (b) Is highly inductive
- (c) Is highly capacitive
- (d) Has a phase angle equal to load power factor angle

Ans: (b)

2278. The creeping is observed in

- (a) Armmeter
- (b) Wattmeter
- (c) Energy meter
- (d) Volt meter

Ans: (c)

2279. The pressure coil of an induction type energy meter is

- (a) Highly resistive
- (b) Highly inductive
- (c) Purely resistive
- (d) Purely inductive

Ans: (b)

2280. A dynamometer type wattmeter responds to the

- (a) Average value of active power
- (b) Average value of reactive power
- (c) Peak value of active power
- (d) Peak value of reactive power

Ans: (a)

2281. Holes are drilled on the opposite side of the disc of an induction type energy meter to

- (a) Avoid creep on no load
- (b) Balance the disc
- (c) Dissipate heat energy due to eddy currents
- (d) Increase the deflecting torque

Ans: (a)

2282. In calibration of a dynamometer Wattmeter by potentiometer, phantom loading arrangement is used because

- (a) The arrangement gives accurate results
- (b) The power consumed in calibration work is minimum
- (c) The method gives quick results
- (d) The onsite calibration is possible

Ans: (b)

2283. An energy-meter having a meter constant of 1200 revolutions per kWh is found to make 5 revolutions in 75s. The load power is

- (a) 500 W
- (b) 100 W
- (c) 200 W
- (d) 1000 W

Ans: c

2284. The instantaneous voltage and current across a load is given by $v = 50 \sin (314t - \pi/6)$ volts and $i = 10 \sin (314t - \pi/2)$ amperes, respectively. The active power consumed by the load is:

- (a) 500 watts

- (b) 125 watts
- (c) 1000 watts
- (d) None of these

Ans: (b)

2285. Power consumed by a balanced 3-phase, 3-wire load is measured by two wattmeter method. The first wattmeter reads twice that of the second. Then what will be the load impedance angle in radian?

($\pi/6$)

- (a) ($\pi/3$)
- (b) ($\pi/2$)
- (c) ($\pi/4$)

Ans: (a)

2286. For power measurement of three phase circuit by two wattmeter method, when the value of power factor is less than 0.5 lagging:

- (a) One of the wattmeters will read zero
- (b) Both give the same readings
- (c) One of the wattmeter connections will have to be reversed
- (d) Pressure coil of the wattmeter will become ineffective

Ans: (c)

2287. In two watt meter method of 3 phase power measurement when does one watt meter read negative?

- (a) When power factor is unity
- (b) When power factor is 0.5
- (c) When power factor is less than 0.5
- (d) When power factor is greater than 0.5 and less-than unity

Ans: (c)

2288. A single phase energy meter is operating on 200 V, 50 Hz supply with a load of 10A for two hours at 0.8 p.f The meter takes 1800 revolutions in that period. The meter constant is:

- (a) 1800 rev/kWh
- (b) 900 rev/kWh
- (c) 1000 rev/kWh
- (d) 562 rev/kWh

Ans: (d)

2289. In a single phase induction type energy meter, the deflecting torque is the true power in the circuit.

- (a) Proportional to
- (b) Equal to
- (c) Greater than
- (d) Less than

Ans: (a)

2290. Single or One Wattmeter Method can only be used for ---

- (a) Balanced three-phase load

- (b) Imbalanced two-phase load
- (c) Balanced one-phase load
- (d) Imbalanced one-phase load

Ans: (a)

2291. In a single phase Dynamometer Wattmeter, the instantaneous torque has a component of power which varies as the frequency of current and voltage.

- (a) Twice
- (b) Half
- (c) Four times
- (d) Three times

Ans: (a)

2292. According to Blondel's theorem, if a network is supplied using 'n' conductors, the total power is the of the reading of n wattmeters so arranged that a current coil of each wattmeter is in each line and the corresponding pressure coil is connected between that line and a common point.

- (a) Sum
- (b) Product
- (c) Sum of products of two wattmeter's reading taken together
- (d) Difference

Ans: (a)

2293. Calculate the percentage error for a wattmeter which is so connected that the current coil is on the load side. The wattmeter has a current coil of 0.03Ω resistance and a pressure coil of 6000Ω resistance. It is also known that the load takes 20A at a voltage of 220 V and 0.6 power factor.

- (a) 0.45%
- (b) 45%
- (c) 5.5%
- (d) 6.5%

Ans: (a)

2294. The power of system, three-phase 10kVA load with a power factor of 0.342, is measured by two-wattmeter method. The readings of two wattmeters are W 1 and W 2. What can be said about these readings?

- (a) When power factor is changed from lagging to leading, the readings of W 1 and W 2 INcrease.
- (b) When power factor is changed from lagging to leading, the readings of W 1 and W 2 get interchanged.
- (c) When power factor is changed from lagging to leading, the readings of W 1 and W 2 decrease.
- (d) When power factor is changed from lagging to leading, the readings of W 1 and W 2 attain negative sign always.

Ans: (b)

2295. The type of wattmeter commonly used for measurement of power in AC circuits is:

- (a) Moving iron type
- (b) Thermocouple type

- (c) Rectifier type
- (d) Dynamometer type

Ans: (d)

2296. Induction type energy meter measures energy in

- (a) Joules
- (b) Kw
- (c) kWh
- (d) kW.s

Ans: (c)

2297. Two wattmeter method can be used to measure the total power delivered to:

- (a) Star connected with neutral loads
- (b) Delta connected load only
- (c) Star connected load only
- (d) Star as well as delta connected loads

Ans: (d)

2298. The pressure coil of a wattmeter consists of:

- (a) More number of turns of fine wire
- (b) Less number of turns of fine wire
- (c) Less number of turns of thick wire
- (d) More number of turns of thick wire

Ans: (a)

2299. Household energy meter falls under category of which type of instrument?

- (a) A magnetically revolving type instrument
- (b) A recording instrument
- (c) A displaying instrument
- (d) An integrating instrument

Ans: (d)

2300. Energy meter runs slowly even if power is not used. This error is called

- (a) Speed error
- (b) Phase error
- (c) Creeping error
- (d) None of these

Ans: (c)

2301. While measuring power in a three phase load by two wattmeter method, the reading of two wattmeter are equal and opposite, when

- (a) Load is balanced
- (b) Power factor is unity
- (c) Phase angle is between 60° to 90°
- (d) The load is purely inductive

Ans: (d)

2302. If a dynamometer wattmeter is connected in an ac circuit, the power indicated by the wattmeter will be

- (a) Volt-ampere product
- (b) Average power
- (c) Peak power
- (d) Instantaneous power

Ans: (b)

2303. A compensated wattmeter has its reading corrected for error due to

- (a) Frequency
- (b) Friction
- (c) Power consumed in current coil
- (d) Power consumed in pressure coil

Ans: (d)

2304. The disc of domestic supply energy meter is made of which material ?

- (a) Zinc
- (b) Copper
- (c) Aluminium
- (d) Silver

Ans: (c)

2305. In induction wattmeters, the instantaneous value of deflecting torque is voltage undermeasurement.

- (a) Directly proportional
- (b) Inversely proportional
- (c) Directly proportional to the square of
- (d) Inversely proportional to the square of

Ans: (c)

2306. In energy meter, if brake magnet is moved away from the spindle of the moving disc, the aluminium disc.

- (a) Will run fast
- (b) No effect
- (c) Will run slow
- (d) Will come to a stop

Ans: (c)

2307. Ampere-Hour meter (DC) is rated for 20A, 250 V The meter constant is 15 A-sec/rev. The meter constant at rated voltage may be expressed as:

- (a) 3750 rev/kWh
- (b) 3600 rev/kWh
- (c) 1000 rev/kWh
- (d) 960 rev/kWh

Ans: (d)

2308. Calculate the power factor for a 3 phase load measuring 2 kW and 1 kW by using the 2 wattmeter method.

- (a) 0.824

- (b) 0.842
- (c) 0.866
- (d) 0.91

Ans: (c)

2309. To measure the total power on a three-phase system supplying a balanced load, two wattmeters reads 7.5 kW and -1.5 kW, respectively. The total power and the power factor, respectively, are:

- (a) 13.0 kW, 0.334
- (b) 5.0 kW, 0.684
- (c) 8.0 kW, 0.52
- (d) 6.0 kW, 0.359

Ans: (d)

2310. An electrodynamic type of instruments finds its major use as

- (a) Standard instrument only
- (b) Transfer instrument only
- (c) Both as standard and transfer instruments
- (d) An indicator type of instrument

Ans: (c)

2311. Dynamometer type of instrument can use in:

- (a) AC
- (b) DC
- (c) AC and DC
- (d) Pulsating

Ans: (c)

2312. Which of the following instruments is equally accurate on AC as well as DC circuits?

- (a) PMMC voltmeter
- (b) Dynamometer wattmeter
- (c) Moving iron ammeter
- (d) Induction wattmeter

Ans: (b)

2313. A wattmeter reads 25.34 W. The absolute error in measurement is -0.11 W. What is the true value of power?

- (a) 25.23 W
- (b) 25.45 W
- (c) -25.23 W
- (d) -24.45 W

Ans: (b)

2314. Watt-hour instrument is the type of

- (a) Indicating
- (b) Integrating
- (c) Recording

(d) None of the above

Ans: (b)

2315. Induction type instrument are used in

(a) AC

(b) DC

(c) Both

(d) None of the above

Ans: (a)

2316. The correct statement about Electrodynamometer instrument amongst the following is :

(a) Its scale is linear

(b) It measures only DC

(c) It is a transfer instrument

(d) Its sensitivity is lesser than MI type

Ans: (c)

2317. A Dynamo works on the principle of _____

(a) Supercharging

(b) Electromagnetic induction

(c) Alternating current

(d) Kirchoff's Law

Ans: (b)

2318. A volt meter has resistance of 2000Ω , when it is connected across a d.c. circuit its power consumption is 2 mW. Suppose this voltmeter is replaced by a voltmeter of 4000Ω resistance the power consumption will be

(a) 4 mW

(b) 1 mW

(c) 2 mW

(d) none of these

Ans: (b)

2319. The Energy provided by Ideal voltage source when the load is open circuit

(a) Zero

(b) Infinite

(c) Unity

(d) Not specific

Ans: (a)

2320. The active and apparent power in an inductive circuit are 60 kW and 100 kVA respectively. The power factor of the circuit is:

(a) 0.6 leading

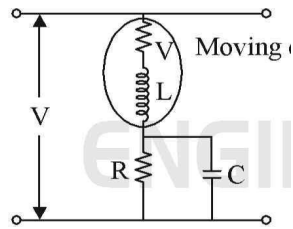
(c) 0.5 lagging

(b) 0.6 lagging

(d) 0.75 lagging

Ans: (b)

2321. The purpose of capacitor in the moving coil instrument figure is:



- (a) To compensate for the error due to supply variation
- (b) To bypass the resistor R
- (c) To compensate for error due to inductance of pressure coil.
- (d) To increase the impedance

Ans: (c)

2322. Which type of wattmeter can not be used for both AC and DC?

- (a) Dynamometer type
- (b) Electrostatic type
- (c) Induction type
- (d) None of the above

Ans: c

2323. In the two wattmeter method of measuring 3 phase power, the wattmeter indicated equal and opposite readings when load power factor is-

- (a) 90° leading
- (b) 90° lagging
- (c) 30° leading
- (d) 30° lagging

Ans: (b)

2324. Measurement of power of a 3-phase balanced load is done using two wattmeter method. If the ratio of the wattmeter readings is 2 : 1 then power factor of the circuit will be

- (a) 0.0
- (c) 0.5
- (b) 1.0
- (d) 0.866

Ans: (d)

2325. The pressure coil of a wattmeter should be supply side of the current coil when ____

- (a) Supply voltage is low
- (b) Supply voltage is high
- (c) Load impedance is low
- (d) Load impedance is high

Ans: (d)

2326. The pressure coil of a dynamometer type wattmeter is

- (a) Highly inductive
- (b) Highly resistive
- (c) Purely resistive
- (d) Purely inductive

Ans: (b)

2327. Two wattmeter method for measuring power factor is used for

- (a) Balanced load only
- (b) Balanced and unbalanced loads
- (c) Unbalanced load only
- (d) Star connected balanced load only

Ans: (b)

2328. In a 3-phase, 3-wire unbalanced load, power cannot be measured by two wattmeters

- (a) True
- (b) False
- (c) Cannot be said
- (d) None of these

Ans: (b)

2329. In a balanced 3-phase 400 V circuit, the line current is 115.5 A when the power is measured by two wattmeter method, one meter reads 40 kW and the other zero. What is the power factor of the load

- (a) 1
- (b) 0.5
- (c) 0.6
- (d) 0.8

Ans: (b)

2330. The power of a n-phase circuit can be measured by using a minimum of

- (a) n elements
- (b) 2n wattmeter elements
- (c) (n-1) wattmeter element
- (d) (n+1) wattmeter element

Ans: (c)

2331. In an electrodynamicometer type wattmeter:

- (a) The current coil is made fixed
- (b) The pressure coil is fixed
- (c) Both the coil are fixed
- (d) Both the coils are movable

Ans: (a)

2332. In a single phase induction type wattmeter, a meter can be reversed by

- (a) Reversing either the potential coil terminal or current coil terminals
- (b) Reversing connections of both current and potential coil circuits
- (c) Reversing the supply terminals
- (d) Reversing the load terminals

Ans: (a)

2333. One single phase wattmeter operating on 230 V and 5 A for 5 hours makes 1940 revolutions. Meter constant in Rev/kWh is 400. The power factor of the load will be:

- (a) 1
- (b) 0.84
- (c) 0.7
- (d) 0.6

Ans: (b)

2334. In an electrodynamicometer type wattmeter if the voltage and current measured are given by $V=100 \sin 314t$ and $i=10 \sin (314t-60^\circ)$ respectively, the reading (in watts) will be

- (a) 1000
- (c) 250
- (b) 500
- (d) 433

Ans: c

2335. How many coils are there in a wattmeter?

- (a) 2
- (b) 3
- (c) 4
- (d) 1

Ans: (a)

2336. The power in an unbalance 3-phase 4-wire circuit can be measured by using a method

- (a) 4 wattmeter
- (b) 3 wattmeter
- (c) 2 wattmeter
- (d) 1 wattmeter

Ans: (b)

2337. In dynamometer wattmeter the compensation coil

- (a) Has equal number of turns of voltage coil and is connected in series with current coil
- (b) Has equal number of turns of current coil and is connected in series with voltage coil
- (c) Has equal number of turns of current coil and is connected in series with current coil
- (d) Has equal number of turns of voltage coil and is connected in series with voltage coil

Ans: (b)

2338. A single phase 230 V energy meter has a constant load of 5 A passing through it for 6 hours at unity p.f. If the meter disc makes 2070 revolutions during this period. What is the meter constant in revolutions per unit?

- (a) 100 rev/unit
- (b) 200 rev/unit
- (c) 300 rev/unit

(d) 400 rev/unit

Ans: (c)

2339. An energy meter is designed to make 100 revolution for one unit of energy. Calculate the number of revolutions made by it when connected to load carrying 50 A at 230 V and 0.6 pf an hour :

- (a) 575 revolutions
- (b) 1150 revolutions
- (c) 920 revolutions
- (d) 690 revolutions

Ans: (d)

2340. An energy meter is designed to make 100 revolutions for one unit of energy. The number of revolutions when connected to a load of 40 A, at 230 V and 0.95 power factor lagging for an hours is :

- (a) 657
- (c) 362
- (b) 874
- (d) 530

Ans: (b)

2341. Copper shading is provided in energy meter to

- (a) Bring flux exactly in quadrature with applied voltage
- (b) To increase speed of aluminium disc
- (c) To count the rotation
- (d) To balance the system from vibration

Ans: (a)

2342. A single phase energy meter has a constant of 1200 revolution/kWh. When a load of 200 W is connected, the disc rotates at 4.2 revolutions per min. If the load is on for 10 hours, the meter records an excess of

- (a) 0.1 kWh
- (c) 1.0 kWh
- (b) 0.2 kWh
- (d) 2.1 kWh

Ans: (a)

2343. The energy meter installed at a residence charges the consumer for use of:

- (a) Apparent power
- (b) True power
- (c) Reactive power
- (d) Product of voltage and current

Ans: (b)

2344. In an LVDT, the core is made up of a

- (a) Magnetic material
- (b) Non-magnetic material
- (c) High permeability nickel - iron hydrogen annealed material

(d) Low permeability nickel iron hydrogen annealed

Ans: (c)

2345. Time base generators used in CRO produces waveforms

- (a) Sine
- (b) Square
- (c) Sweep
- (d) Pulse

Ans: (c)

2346. CRO probe assembly is an application of

- (a) Multi vibrator
- (b) Attenuator
- (c) Clipper
- (d) Clamper

Ans: (b)

2347. The Lissajous pattern on the screen of a CRO is an ellipse with major axis in quadrant 2 and quadrant 4. Then the phase difference between two signals can be

- (a) 270°
- (b) 210°
- (c) 180°
- (d) 300°

Ans: (b)

2348. Q-meter works on the principal of

- (a) Series resonance
- (b) Parallel resonance
- (c) Mutual inductance
- (d) Self inductance

Ans: (a)

2349. A sinusoidal waveform, when observed on an oscilloscope has a peak to peak amplitude of 6 cm. If the vertical sensitivity setting is 5 V/cm, the rms value of the voltage is

- (a) 10.6 V
- (b) 11.1 V
- (c) 12.6 V
- (d) 15 V

Ans: (a)

2350. Assertion (A): Vertical deflection sensitivity of a CRO is higher than that of the horizontal system. Reason (R): Sweep voltage is applied to the horizontal deflecting plates.

- (a) Both A and R are true and R is the correct explanation of A
- (b) Both A and R are true but R is not a correct explanation of A
- (c) A is true but R is false
- (d) A is false but R is true

Ans: (a)

2351. When 30 V DC is applied to the vertical deflecting plates of a cathode ray tube, the bright spot moves 1 cm away from the centre. If 30 V (rms) AC is applied, then the

movement of the spot will be nearly

- (a) 1 cm
- (b) 1.5 cm
- (c) 2 cm
- (d) 3 cm

Ans: (a)

2352. In measuring the distributed capacitance of a certain coil using Q-meter, initial resonance at frequency 2 MHz is obtained by tuning the capacitance set to 430 pF. If resonance at 4 MHz is obtained by tuning the capacitance set to 100 pF, then the value of would be

- (a) 10 pF
- (b) 20 pF
- (c) 100 pF
- (d) 200 pF

Ans: (a)

2353. Assertion (A): The screen of the CRT is coated with phosphor on the inside. Reason (R): phosphor absorbs the kinetic energy of the bombarding electrons and re-emits energy at a frequency in the visible region.

- (a) Both A and R are true and R is the correct explanation of A
- (b) Both A and R are true but R is not a correct explanation of A
- (c) A is true but R is false
- (d) A is false but R is true

Ans: (a)

2354. The purpose of applying post deflection potential is

- (a) To increase deflection sensitivity
- (b) To speed up the electrons
- (c) To increase the brightness of the spot
- (d) To keep deflection angle unchanged

Ans: c

2355. The y input of a CRO a signal defined by $10 \sin 100 t$ is applied. The x input, the signal $10 \cos 100 t$ is fed. The gain for both x channels and any y channel is the same. The screen shows

- (a) Sinusoidal signal
- (b) A straight line
- (c) An ellipse
- (d) A circle

Ans: (d)

2356. Which meter is suitable for the measurement of 10 mV at 50 MHz ?

- (a) Moving iron voltmeter
- (b) VTVM
- (c) Electrostatic Voltmeter
- (d) CRO

Ans: (d)

2357. What is the range for a $3\frac{1}{2}$ digital meter?

- (a) 0 to 1999
- (b) 0 to 1500
- (c) 0 to 999
- (d) 0 to 19999

Ans: (a)

2358. The circuit generally used in digital instruments to convert sine waves into rectangular pulses is a

- (a) Sawtooth generator
- (b) Differential amplifier
- (c) Sample and hold circuit
- (d) Schmitt trigger

Ans: (d)

2359. A certain oscilloscope with 4 cm x 4 cm screen has its own sweep output fed to its input. If the x and y sensitivities are same, the oscilloscope will display a

- (a) Triangular wave
- (b) Diagonal line
- (c) Sine wave
- (d) Circle

Ans: (b)

2360. The battery cells in an electronic multimeter are required to measure which one of the following?

- (a) Resistance
- (b) Voltage
- (c) Current
- (d) Power

Ans: (a)

2361. Modern electronic multimeter measure resistance by

- (a) Using a bridge circuit
- (b) Using an electronic bridge compensator for nulling
- (c) Forcing a constant current and measuring the voltage across the unknown resistor
- (d) Applying a constant voltage and measuring the current through the unknown resistor

Ans: (c)

2362. In a Q-meter measurement to determine the selfcapacitance of a coil, the first resonance occurred at f_1 with $C_1 = 300$ pF. The second resonance occurred at $f_2 = 2f_1$ with $C_2 = 60$ pF.

The self capacitance of coil works out to be

- (a) 240 pF
- (b) 60 pF
- (c) 360 pF
- (d) 20 pF

Ans: (d)

2363. The input impedance of CRO is nearly

- (a) Zero
- (b) Around 10 ohms
- (c) Around 100 ohms
- (d) Around one mega ohm

Ans: (d)

2364. A signal of 10 mV at 75 MHz is to be measured. Which of the following instruments can be used?

- (a) VTVM
- (b) Cathode ray oscilloscope
- (c) Moving iron voltmeter
- (d) Digital multimeter

Ans: (b)

2365. LVDT is a:

- (a) Displacement transducer
- (b) Velocity transducer
- (c) Acceleration transducer
- (d) Pressure transducer

Ans: (a)

2366. Semi conductor strain gauges depend upon _____ for their action.

- (a) Piezo electric effect
- (b) Piezo resistive effect
- (c) Hall's effect
- (d) Superconductivity

Ans: (b)

2367. Transducers may not be called as:

- (a) Gauges
- (b) Pickups
- (c) Signal generators
- (d) Amplifiers

Ans: (d)

2368. LVDT can not measure:

- (a) Weight
- (b) Pressure
- (c) Acceleration
- (d) Temperature

Ans: (d)

2369. Which gauge is used to measure the thickness of sheet?

- (a) Wire gauge
- (b) Sheet gauge
- (c) Feeler gauge
- (d) Pitch gauge

Ans: (b)

2370. The stroboscope is used to measure?

- (a) Displacement speed
- (b) Pressure
- (c) Speed
- (d) Temperature

Ans: (c)

2371. Load cell essentially is a

- (a) Thermistor
- (b) Strain gauge
- (c) Photo voltaic cell
- (d) Photo diode

Ans: (b)

2372. Solar beam radiation is measured using

- (a) Anemometer
- (b) Thermometer
- (c) Sunshine
- (d) Pyrheliometerrecorder

Ans: (d)

2373. A thermo-couple ammeter/voltmeter has

- (a) A logarithmic law response
- (b) A square law response
- (c) A linear law response
- (d) None of these

Ans: (b)

2374. A thermopile is-

- (a) Used to detect thermal radiation
- (b) Used to measure heating effect of electric current
- (c) A number of thermo-couples joined in parallel
- (d) Both (a) & (b)

Ans: (c)

2375. The operation of a Thermocouple is based on:

- (a) Thomson effect
- (b) Seebeck effect
- (c) Peltier effect
- (d) Faraday's laws

Ans: (b)

2376. The output of a thermo-couple is

- (a) DC current
- (b) DC voltage
- (c) AC current
- (d) AC voltage

Ans: (b)

2377. Which of the following instruments is exclusively used for measuring radio frequency currents?

- (a) Moving iron
- (b) Thermocouple
- (c) PMMC
- (d) Electrodynamic

Ans: (b)

2378. Electrolytic meter is basically a/an

- (a) DC ampere-hour meter
- (b) DC watt hour meter
- (c) AC energy meter
- (d) AC ampere-hour meter

Ans: (a)

2379. Thermistor is employed for measurement of

- (a) Linear displacement
- (b) Acceleration
- (c) Pressure
- (d) Temperature

Ans: (d)

2380. The emf developed by a thermocouple depends upon.

- (a) Length of wires and temperature difference at two ends
- (b) Material used, temperature of hot and cold junctions
- (c) Material used, diameter of wires and temperature gradient
- (d) Material used, shape and size of materials and temperature difference

Ans: (b)

2381. Which of these instruments has highest power consumption?

- (a) Dynamometer
- (b) Electrostatic
- (c) Moving coil
- (d) Hot Wire

Ans: (d)

2382. The sweep generator of a CRO is used to produce:

- (a) Sinusoidal voltage for the vertical deflection of electron beam
- (b) Saw tooth voltage for the horizontal deflection of electron beam
- (c) Saw tooth voltage for the vertical deflection of electron beam
- (d) Sinusoidal voltage for the horizontal deflection of electron beam

Ans: (b)

2383. A Lissajous pattern on an oscilloscope has 5 horizontal tangencies and 2 vertical tangencies. The frequency of the horizontal input is 1000 Hz. What is the frequency of the vertical input?

- (a) 400 Hz
- (b) 5000 Hz

- (c) 4000 Hz
- (d) 2500 Hz

Ans: (d)

2384. In CRT, the secondary electrons are collected by a conductive coating aquadag which is made up of -- .

- (a) Hydrazine solution
- (b) Zirconium solution
- (c) Graphite solution
- (d) Rubber

Ans: (c)

2385. The calibration signal available from CRO is of the form :

- (a) Sinusoidal wave
- (b) Square wave
- (c) Sawtooth wave
- (d) DC signal

Ans: (c)

2386. An Aquadag is used in a CRO to collect

- (a) Primary electrons
- (b) Secondary emission electrons
- (c) Both (a) and (b)
- (d) None of these

Ans: (b)

2387. The wave applied to X plates in a CRO, for obtaining trace of voltage wave, is

- (a) Sawtooth wave
- (b) Sinusoidal wave
- (c) Rectangular wave
- (d) Either (a) or (b)

Ans: (a)

2388. An inverse transducer converts

- (a) Electrical energy to any other form of energy
- (b) Electrical energy to light energy
- (c) Mechanical displacement into electrical
- (d) Electrical energy to mechanical form

Ans: (a)

2389. Synchro is

- (a) Probolic transducer
- (b) An angular position transducer
- (c) A synchronizing transducer
- (d) A variable transducer

Ans: (b)

2390. The transducer employed for measurement of angular displacement is

- (a) LVDT
- (c) Thermistor
- (b) Thermocouple
- (d) Circular potentiometer

Ans: (d)

ELECTRONICS

2391. What is a photocell primarily used for?

- (a) Generating sound
- (b) Detecting light intensity**
- (c) Amplifying current
- (d) Storing electrical energy

2392. A photocell operates based on which effect?

- (a) Hall effect
- (b) Thermoelectric effect
- (c) Photoelectric effect**
- (d) Electromagnetic induction

2393. Which of the following is a correct use of photo sensors in CNC automation?

- (a) Tool wear detection
- (b) Workpiece presence verification**
- (c) Motor speed control
- (d) Spindle alignment

2394. Which of the following is *not* an application of photocells?

- (a) Smoke detection
- (b) TV remote control
- (c) Automatic street lights
- (d) Audio amplification**

2395. Photocells convert light energy into which type of energy?

- (a) Thermal**
- (b) Mechanical**
- (c) Electrical
- (d) Magnetic**

2396. The output of a photocell is generally

- (a) AC voltage
- (b) DC voltage**
- (c) Magnetic field
- (d) Sound wave

2397. When photo electric based sensor used for part detection of false detection is mainly due to

- (a) Mounting position (line of sight)

- (b) Ambient light immunity (to avoid false signals)
- (c) Dirt/oil/Mud in reflector (For reflector type)
- (d) **All of the above**

2398. Which of the following sensors is not a photoelectric sensor?

- (a) Through-beam
- (b) Retro-reflective
- (c) **Inductive proximity**
- (d) Diffuse reflective

2399. What is the longest sensing range typically found in photoelectric sensors?

- (a) Diffuse type
- (b) Retro-reflective
- (c) **Through-beam**
- (d) Capacitive

2400. When a photocell detects an axle in a CNC loading station, what type of signal is typically sent to the PLC?

- (a) Analog voltage
- (b) PWM signal
- (c) **Digital input (ON/OFF)**
- (d) Sinusoidal wave

2401. Which of the following sensors is not a photoelectric sensor?

- (a) Through-beam
- (b) Retro-reflective
- (c) **Inductive proximity**
- (d) Diffuse reflective

2402. What type of proximity sensor can detect both metallic and non-metallic objects?

- (a) Inductive
- (b) **Capacitive**
- (c) Magnetic
- (d) Optical

2403. What is the typical range of an inductive proximity sensor?

- (a) 10–50 cm
- (b) **1–10 mm**
- (c) 1–2 meters
- (d) Over 5 meters

2404. What happens when a metallic object enters the sensing field of an inductive proximity sensor?

- (a) Capacitance increases
- (b) Frequency decreases
- (c) Magnetic field strengthens
- (d) **Eddy currents are induced, causing output signal**

2405. An inductive proximity switch works best with which of the following targets?
- (a) Wood
 - (b) Glass
 - (c) Aluminum
 - (d) **Steel**
2406. Which proximity switch uses the Doppler effect for object detection?
- (a) Inductive
 - (b) Capacitive
 - (c) **Ultrasonic**
 - (d) Magnetic
2407. Which sensor would be most suitable in a dusty environment for detecting metal objects?
- (a) Capacitive sensor
 - (b) **Inductive sensor**
 - (c) Optical sensor
 - (d) Magnetic sensor
2408. Which application typically uses an inductive proximity switch?
- (a) Detecting a plastic bottle on a conveyor
 - (b) **Counting metal parts in an assembly line**
 - (c) Measuring temperature in a furnace
 - (d) Detecting humidity in a chamber
2409. In SPM CNC machines, proximity switches are commonly used to:
- (a) Display cutting force
 - (b) **Detect tool position or home reference**
 - (c) Show RPM of spindle
 - (d) Display coolant temperature
2410. What happens in a CNC machine if a reference proximity switch fails during homing?
- (a) The program auto-skips to the next cycle
 - (b) **The machine may stop or alarm out**
 - (c) The switch gets bypassed
 - (d) Nothing; it keeps running normally
2411. Which PLC instruction is commonly used to process a signal from a proximity switch?
- (a) PID
 - (b) MOV
 - (c) TON (Timer ON Delay)
 - (d) **XIC/XIO (Examine If Closed/Open)**
2412. In SPM machine, in Machine shop, inductive proximity switches are used in turrets for
- (a) Turret Zero position
 - (b) Tool lock & Unlock

- (c) **Both A&B**
 - (d) None of these
2413. Proximity switches in CNC machines are preferred over mechanical limit switches because they:
- (a) Are cheaper
 - (b) **Work faster and have no contact wear**
 - (c) Require lubrication
 - (d) Have analog output
2414. Which of the following can cause a proximity switch to give a false signal?
- (a) Correct sensing distance
 - (b) Shielded cable
 - (c) **Electromagnetic interference (EMI)**
 - (d) Clean sensor face
2415. A capacitive proximity switch may malfunction if exposed to:
- (a) Metal chips
 - (b) Dry air
 - (c) **High humidity or moisture**
 - (d) Stainless steel
2416. If the sensing face of an inductive proximity switch is covered with metal dust or chips, it can result in
- (a) Improved detection
 - (b) Faster operation
 - (c) **Malfunction or false triggering**
 - (d) Increased range
2417. In CNC machines, what is commonly used to confirm the correct position after indexing?
- (a) Temperature sensor
 - (b) Limit switch
 - (c) **Proximity switch or encoder**
 - (d) Pressure gauge
2418. In Machine shop Gantries, gripper is close & is confirmed by
- (a) Proximity switch
 - (b) Pressure Switch
 - (c) **Both A&B**
 - (d) None of the above
2419. Which of the following devices allows current to flow only in one direction?
- (a) Resistor
 - (b) Capacitor
 - (c) **Diode**
 - (d) Inductor
2420. The unit of capacitance is:

- (a) Henry
 - (b) Ohm
 - (c) **Farad**
 - (d) Volt
2421. What is the function of a rectifier circuit?
- (a) Converts DC to AC
 - (b) Amplifies AC signal
 - (c) **Converts AC to DC**
 - (d) Stores energy
2422. In an RC circuit, the time constant (τ) is given by:
- (a) $R + C$
 - (b) **RC**
 - (c) R/C
 - (d) $1/RC$
2423. Which component stores energy in the form of a magnetic field?
- (a) Capacitor
 - (b) Resistor
 - (c) Diode
 - (d) **Inductor**
2424. The input and output of an ideal operational amplifier (op-amp) in an inverting configuration are:
- (a) In-phase
 - (b) **Out of phase by 180 degrees**
 - (c) Always zero
 - (d) Equal in magnitude
2425. Which of the following is a unidirectional semiconductor device?
- (a) Zener diode
 - (b) Bipolar junction transistor
 - (c) SCR (Silicon Controlled Rectifier)
 - (d) LED
2426. The logic gate that outputs HIGH only when all inputs are HIGH is:
- (a) OR gate
 - (b) **AND gate**
 - (c) NAND gate
 - (d) NOR gate
2427. The purpose of a bypass capacitor in an amplifier circuit is to:
- (a) Reduce noise
 - (b) Stabilize voltage
 - (c) **Short AC signal to ground**
 - (d) Increase resistance
2428. In a full-wave bridge rectifier, the output frequency is:

- (a) Equal to the input AC frequency
 - (b) Half the input frequency
 - (c) **Twice the input frequency**
 - (d) Zero
2429. A Zener diode is used in electronic circuits primarily for:
- (a) Rectification
 - (b) Amplification
 - (c) **Voltage regulation**
 - (d) Oscillation
2430. What is the function of a coupling capacitor in amplifier circuits?
- (a) To store energy
 - (b) **To block DC and allow AC to pass**
 - (c) To increase gain
 - (d) To short circuit the input
2431. The current gain (β) of a BJT is defined as:
- (a) I_E / I_C
 - (b) **I_C / I_B**
 - (c) V_{CE} / V_{BE}
 - (d) I_B / I_C
2432. Which type of feedback is generally used in amplifier circuits for stability and reduced distortion?
- (a) Positive feedback
 - (b) **Negative feedback**
 - (c) Regenerative feedback
 - (d) Current feedback
2433. In an ideal op-amp, the input impedance is:
- (a) Zero
 - (b) Very low
 - (c) **Very high (ideally infinite)**
 - (d) Equal to output impedance
2434. Which configuration of a BJT gives the highest input impedance?
- (a) Common Emitter
 - (b) Common Base
 - (c) **Common Collector**
 - (d) Darlington Pair
2435. The purpose of a clamping circuit is to:
- (a) Amplify the signal
 - (b) Limit the voltage
 - (c) **Shift the DC level of a waveform**
 - (d) Rectify the input
2436. A NOT gate has an input of logic '1'. The output will be:

- (a) **0**
 - (b) 1
 - (c) Undefined
 - (d) Same as input
2437. A silicon diode in a circuit has 0.7V across it and is forward biased. If the temperature increases, what happens to the forward voltage drop?
- (a) Increases
 - (b) **Decreases**
 - (c) Remains the same
 - (d) Becomes zero
2438. An op-amp with a very high gain is configured as an inverting amplifier with feedback. If the input signal becomes very large, what type of distortion may occur?
- (a) Harmonic distortion
 - (b) **Clipping**
 - (c) Crossover distortion
 - (d) Phase distortion
2439. What type of junction is used in a basic diode?
- (a) NN
 - (b) **PN**
 - (c) PP
 - (d) NP
2440. When a diode is forward biased, it:
- (a) Blocks current
 - (b) Allows current in reverse direction
 - (c) **Allows current in forward direction**
 - (d) Acts as a resistor
2441. In reverse bias, a diode conducts:
- (a) Fully
 - (b) **Slightly (leakage current)**
 - (c) With high efficiency
 - (d) Like a battery
2442. The typical forward voltage drop for a silicon diode is:
- (a) 0.1 V
 - (b) 0.3 V
 - (c) **0.7 V**
 - (d) 1.5 V
2443. The knee voltage of a diode is the voltage at which:
- (a) The diode starts leaking
 - (b) **Forward current increases rapidly**
 - (c) Reverse breakdown begins
 - (d) It behaves as an insulator

2444. Which diode emits light when forward biased?
- (a) Zener diode
 - (b) LED**
 - (c) Photodiode
 - (d) Tunnel diode
2445. Which diode works in reverse bias and generates current in response to light?
- (a) LED
 - (b) Zener diode
 - (c) Photodiode**
 - (d) Schottky diode
2446. What is the key characteristic of a Schottky diode?
- (a) High reverse resistance
 - (b) Low forward voltage drop**
 - (c) High capacitance
 - (d) Zero breakdown voltage
2447. A tunnel diode is used in:
- (a) Low-frequency rectification
 - (b) High-frequency oscillators**
 - (c) Signal clipping
 - (d) Voltage regulation
2448. A half-wave rectifier gives output during:
- (a) Both halves of AC cycle
 - (b) Positive half only**
 - (c) Negative half only
 - (d) No part of the cycle
2449. In a full-wave bridge rectifier, how many diodes conduct at a time?
- A) 1
 - B) 2**
 - C) 3
 - D) 4
2450. The PIV (Peak Inverse Voltage) across each diode in a full-wave bridge rectifier is:
- (a) V_m**
 - (b) $2V_m$
 - (c) $V_m/2$
 - (d) Zero
2451. Clipping circuits are used to:
- (a) Convert AC to DC
 - (b) Remove portions of signal**
 - (c) Amplify signals
 - (d) Invert signals
2452. Clamping circuits shift the:

- (a) Frequency of waveform
 - (b) Amplitude & frequency
 - (c) **DC level**
 - (d) Phase
2453. The maximum current a diode can safely conduct is called:
- (a) Peak inverse current
 - (b) **Average forward current**
 - (c) Reverse leakage
 - (d) Breakdown current
2454. What is reverse leakage current in a diode?
- (a) Forward conduction
 - (b) **Current during reverse bias**
 - (c) Peak current
 - (d) None of the above
2455. Which factor affects the reverse recovery time of a diode?
- (a) **Material**
 - (b) Load resistance
 - (c) Capacitance
 - (d) Operating temperature
2456. Which diode parameter is most important for high-speed switching?
- (a) Reverse voltage rating
 - (b) Capacitance
 - (c) **Recovery time**
 - (d) Forward current
2457. The dynamic resistance of a diode is calculated using:
- (a) Ohm's law
 - (b) **dV/dI in forward region**
 - (c) Power formula
 - (d) $P = IV$
2458. Which application uses a Zener diode?
- (a) Current amplification
 - (b) Frequency modulation
 - (c) **Overvoltage protection**
 - (d) Filtering
2459. Which diode is used in RF tuning circuits?
- (a) LED
 - (b) Zener diode
 - (c) **Varactor diode**
 - (d) Tunnel diode
2460. Photodiodes are typically operated in:
- (a) Forward bias
 - (b) **Reverse bias**
 - (c) Zero bias

- (d) Breakdown region
2461. Static resistance of a diode is defined as:
- (a) dV/dI at any point
 - (b) V/I at a specific point**
 - (c) Maximum voltage / current
 - (d) Voltage at zero current
2462. Dynamic resistance is important in:
- (a) DC circuits only
 - (b) Small signal AC analysis**
 - (c) Power calculations
 - (d) Reverse bias condition only
2463. If the diode's forward current increases, its dynamic resistance:
- (a) Increases
 - (b) Decreases**
 - (c) Remains constant
 - (d) Becomes zero
2464. Zener breakdown occurs due to:
- (a) High temperature
 - (b) Avalanche multiplication
 - (c) Tunneling of electrons**
 - (d) Recombination of holes
2465. Avalanche breakdown is dominant in Zener diodes above:
- (a) 1V
 - (b) 5.6V**
 - (c) 0.7V
 - (d) 10V
2466. Zener diodes are generally operated in:
- (a) Forward bias
 - (b) Reverse breakdown region**
 - (c) Zero bias
 - (d) Cut-off mode
2467. In a voltage regulator circuit, Zener diode is connected:
- (a) In series and forward biased
 - (b) In parallel and reverse biased**
 - (c) In parallel and forward biased
 - (d) In series with the load
2468. If Zener diode voltage rating is 6V, it will maintain:
- (a) 0V
 - (b) Constant 6V across load**
 - (c) 12V
 - (d) Varies with current

2469. Schottky diodes are formed by the junction of:
- (a) P-N
 - (b) **Metal-Semiconductor**
 - (c) N-P-N
 - (d) P-type metals
2470. A key feature of a Schottky diode is:
- (a) High reverse leakage
 - (b) Large junction capacitance
 - (c) **Very fast switching speed**
 - (d) Zero forward drop
2471. The forward voltage drop of a Schottky diode is approximately:
- (a) **0.2V–0.3V**
 - (b) 0.6V
 - (c) 1.5V
 - (d) 3V
2472. Which of the following is preferred in high-speed switching circuits?
- (a) Zener diode
 - (b) Tunnel diode
 - (c) **Schottky diode**
 - (d) Varactor diode
2473. Tunnel diode works due to:
- (a) Avalanche breakdown
 - (b) **Tunneling effect in heavily doped P-N junction**
 - (c) Magnetic coupling
 - (d) Emission of photons
2474. Tunnel diode shows negative resistance in its:
- (a) Breakdown region
 - (b) **Peak to valley region**
 - (c) Forward bias saturation
 - (d) Reverse bias only
2475. Which of the following is considered the fastest diode?
- (a) Tunnel diode
 - (b) Schottky diode
 - (c) **Step recovery diode**
 - (d) LED
2476. Step recovery diodes are typically used in:
- (a) Rectification
 - (b) **High-frequency pulse generation**
 - (c) Voltage clamping
 - (d) Light emission
2477. A varactor diode is also known as a:
- (a) Switching diode

- (b) **Variable capacitor diode**
 - (c) Amplifying diode
 - (d) Breakdown diode
2478. In a varactor diode, the capacitance is controlled by:
- (a) Current
 - (b) Temperature
 - (c) **Reverse voltage**
 - (d) Forward voltage
2479. Varactor diodes are commonly used in:
- (a) **Oscillators and RF tuning circuits**
 - (b) Power supply filtering
 - (c) Amplifier biasing
 - (d) Bridge rectifiers
2480. The capacitance of a varactor diode:
- (a) Increases with reverse voltage
 - (b) Remains constant
 - (c) **Decreases with reverse voltage**
 - (d) Only depends on frequency
2481. A PIN diode is unique because it has:
- (a) **Three layers: P, I (Intrinsic), N**
 - (b) Positive-intrinsic-negative behavior
 - (c) Metallic junction
 - (d) High barrier potential
2482. In RF and microwave applications, PIN diodes are used as:
- (a) Voltage regulators
 - (b) Constant current sources
 - (c) **RF switches and attenuators**
 - (d) Voltage clippers
2483. The intrinsic layer in a PIN diode:
- (a) Increases capacitance
 - (b) Reduces resistance in reverse bias
 - (c) **Helps in high-frequency response**
 - (d) Blocks forward conduction
2484. Which diode is best suited for RF switching due to its linear resistance properties?
- (a) Tunnel diode
 - (b) **PIN diode**
 - (c) Varactor diode
 - (d) Schottky diode
2485. A transistor has how many terminals?
- A) 2
 - B) 3**
 - C) 4

D) 5

2486. The three terminals of a BJT are:

- (a) Anode, Cathode, Plate
- (b) Source, Gate, Drain
- (c) **Emitter, Base, Collector**
- (d) Positive, Negative, Neutral

2487. Which transistor is more commonly used in switching applications?

- (a) UJT
- (b) FET
- (c) **BJT**
- (d) Zener

2488. Which of the following is a unipolar device?

- (a) BJT
- (b) SCR
- (c) **FET**
- (d) Diode

2489. In a BJT, current conduction is due to:

- (a) Electrons only
- (b) Holes only
- (c) **Both electrons and holes**
- (d) Ions

2490. In an NPN transistor, the arrow on the emitter points:

- (a) Inward
- (b) **Outward**
- (c) Towards collector
- (d) No direction

2491. Which region of a BJT is thin and lightly doped?

- (a) Collector
- (b) **Base**
- (c) Emitter
- (d) Substrate

2492. What is β (beta) in a BJT?

- (a) Input resistance
- (b) Voltage gain
- (c) **Collector current / base current gain**
- (d) Current loss factor

2493. In which region does a BJT act as an amplifier?

- (a) Cut-off
- (b) Saturation
- (c) **Active**
- (d) Breakdown

2494. Biasing is necessary in a BJT to:
- (a) Increase size
 - (b) Reduce cost
 - (c) **Set Q-point and allow amplification**
 - (d) Change material
2495. Which biasing method provides the best thermal stability for transistor?
- (a) Fixed bias
 - (b) **Voltage-divider bias**
 - (c) Collector-feedback bias
 - (d) Self-bias
2496. Thermal runaway occurs in transistor due to:
- (a) Sudden cooling
 - (b) **Increase in collector current due to temperature rise**
 - (c) Faulty capacitor
 - (d) No base current
2497. The Q-point on a load line of transistor refers to:
- (a) **Quiescent point (steady state DC voltage & current level at which transistor operates W/O I/P Signal)**
 - (b) Quality factor
 - (c) Quantum level
 - (d) Quota point
2498. In CE configuration of BJT, the phase shift between input and output is:
- (a) 0°
 - (b) 90°
 - (c) **180°**
 - (d) 360°
2499. For BJT, Voltage gain is highest in which configuration?
- (a) **CE**
 - (b) CB
 - (c) CC
 - (d) Emitter follower
2500. In BJT configuration, AC load line is drawn to analyze:
- (a) Power loss
 - (b) Large signal behavior
 - (c) **Output voltage swing**
 - (d) DC biasing
2501. The input impedance of a BJT CE (Common Emitter) amplifier is typically:
- (a) Very high
 - (b) **Low**
 - (c) Infinite
 - (d) Zero

- 2502.** In small signal analysis, transistor acts as:
- (a) Open circuit
 - (b) Constant current source
 - (c) Capacitor
 - (d) Amplifier with gain**
- 2503.** In saturation mode, a BJT behaves as a:
- (a) Resistor
 - (b) Open circuit
 - (c) Closed switch**
 - (d) Amplifier
- 2504.** A transistor switch is OFF when it is in:
- (a) Active mode
 - (b) Saturation
 - (c) Cut-off**
 - (d) Breakdown
- 2505.** In switching circuits, the collector-emitter voltage in ON state is:
- (a) Zero
 - (b) Very low**
 - (c) Very high
 - (d) Equal to supply
- 2506.** Transistors used in logic gates operate mainly in:
- (a) Linear region
 - (b) Active mode
 - (c) Switching (cut-off/saturation)**
 - (d) Breakdown region
- 2507.** When used as a switch, a transistor should quickly change between:
- (a) Amplifying and blocking
 - (b) Active and passive
 - (c) Cut-off and saturation**
 - (d) Forward and reverse
- 2508.** A JFET is controlled by:
- (a) Current
 - (b) Voltage at gate**
 - (c) Collector resistance
 - (d) Diode bias
- 2509.** Main advantage of FET over BJT is:
- (a) High current gain
 - (b) Low noise and high input impedance**
 - (c) High voltage gain
 - (d) High power handling
- 2510.** The gate of a JFET is always:
- (a) Forward biased

- (b) **Reverse biased**
- (c) Shorted
- (d) Grounded

2511. In N-channel JFET, current flows from:

- (a) **Source to drain**
- (b) Drain to source
- (c) Gate to source
- (d) Gate to drain

2512. The region in JFET where current remains constant is:

- (a) Ohmic region
- (b) **Saturation region**
- (c) Cut-off region
- (d) Breakdown

2513. A Darlington pair offers:

- (a) High voltage gain
- (b) High input resistance
- (c) **Very high current gain**
- (d) Low power consumption

2514. The output of a phototransistor depends on:

- (a) Temperature
- (b) Input current
- (c) **Light intensity**
- (d) Biasing voltage

2515. A UJT is mainly used in:

- (a) Power amplification
- (b) Voltage regulation
- (c) **Oscillator circuits**
- (d) Rectification

2516. Which device combines two BJTs into one package?

- (a) Phototransistor
- (b) UJT
- (c) **Darlington pair**
- (d) FET

2517. Power transistors are designed to handle:

- (a) Low current only
- (b) **High voltage and current**
- (c) High frequency only
- (d) Small signal only

2518. While testing a good NPN transistor with a multimeter, you will find:

- (a) Both junctions open
- (b) Both junctions short
- (c) One forward, one reverse reading
- (d) **Forward reading from base to both collector and emitter**

2519. A transistor amplifier increases:
- (a) Resistance
 - (b) Capacitance
 - (c) **Signal power**
 - (d) Supply voltage
2520. Which of the following is not a typical transistor application?
- (a) **Rectifier**
 - (b) Amplifier
 - (c) Switch
 - (d) Oscillator
2521. In ICs, transistors are used in the form of:
- (a) Individual components
 - (b) Diodes
 - (c) **Transistor arrays**
 - (d) Relays
2522. A transistor tester mainly checks:
- (a) Resistance
 - (b) Capacitance
 - (c) Forward junctions
 - (d) **Current gain**
2523. Which transistor configuration offers the highest voltage gain?
- (a) Common Base
 - (b) **Common Emitter**
 - (c) Common Collector
 - (d) All are equal
2524. Which transistor configuration is commonly used for impedance matching?
- (a) Common Emitter
 - (b) **Common Collector**
 - (c) Common Base
 - (d) None of the above
2525. In which transistor configuration is the input resistance the lowest?
- (a) Common Emitter
 - (b) Common Collector
 - (c) **Common Base**
 - (d) All equal
2526. Common base configuration is mainly used in:
- (a) Voltage regulation
 - (b) Low-frequency amplification
 - (c) **High-frequency applications**
 - (d) Switching circuits
2527. The common collector configuration is also known as:
- (a) **Emitter follower**

- (b) Base follower
 - (c) Voltage amplifier
 - (d) Phase shifter
- 2528.** Fixed bias circuit suffers from:
- (a) **Stability issues**
 - (b) High gain
 - (c) Low distortion
 - (d) High input impedance
- 2529.** Voltage divider biasing is mostly used in:
- (a) Class D amplifiers
 - (b) Logic gates
 - (c) **Audio amplifiers**
 - (d) Oscillators
- 2530.** In collector-feedback bias, stability is achieved using:
- (a) Capacitor
 - (b) **Resistor feedback from collector to base**
 - (c) Transformer
 - (d) Zener diode
- 2531.** Thermal runaway is reduced by:
- (a) Increasing supply voltage
 - (b) Using fixed bias
 - (c) **Using emitter resistor in biasing**
 - (d) Removing heat sink
- 2532.** JFET is a:
- (a) **Voltage-controlled current device**
 - (b) Current-controlled voltage device
 - (c) Voltage amplifier
 - (d) Rectifier
- 2533.** Compared to BJT, JFET has:
- (a) Lower input impedance
 - (b) **Higher input impedance**
 - (c) Higher noise
 - (d) Higher current gain
- 2534.** Which device is preferred in low-noise amplifiers?
- (a) BJT
 - (b) SCR
 - (c) **JFET**
 - (d) Diode
- 2535.** JFETs are better than BJTs for:
- (a) Power amplification
 - (b) RF switching
 - (c) Digital logic

- (d) **Low signal input amplification**
2536. In terms of control, BJT is _____ and JFET is _____
- (a) **Current-controlled, voltage-controlled**
- (b) Voltage-controlled, current-controlled
- (c) Resistance-controlled, temperature-controlled
- (d) Power-controlled, frequency-controlled
2537. The JFET operates in saturation region for:
- (a) **Constant drain current**
- (b) Maximum gain
- (c) Breakdown operation
- (d) Zero current flow
2538. In JFET, pinch-off voltage is the voltage where:
- (a) Gate current stops
- (b) **Drain current is maximum and constant**
- (c) Channel breaks
- (d) Saturation current becomes zero
2539. When $V_{gs} = 0$, the JFET conducts:
- (a) **Maximum current**
- (b) Minimum current
- (c) No current
- (d) Reverse current
2540. JFET input characteristic is like:
- (a) A forward-biased diode
- (b) **Reverse-biased junction**
- (c) Zener diode
- (d) Triac
2541. Output characteristics of JFET show:
- (a) Increasing current with increasing voltage
- (b) **Constant current beyond pinch-off**
- (c) Negative resistance
- (d) Linear increase in voltage
2542. In power amplifiers, the transistor works in:
- (a) Cut-off
- (b) **Active region**
- (c) Breakdown region
- (d) Forward-biased region only
2543. Power transistors are most commonly found in:
- (a) Digital logic
- (b) **Power supplies and amplifiers**
- (c) Low-voltage detectors
- (d) Oscillators
2544. The safe operating area (SOA) in power transistors indicates:
- (a) Only voltage limits

- (b) Power dissipation limit
- (c) **Maximum current and voltage ratings**
- (d) Frequency range

2545. UJT is most commonly used in:

- (a) Amplifiers
- (b) Oscillators and triggering circuits
- (c) Rectifiers
- (d) Current regulators

Answer: B

2546. The most important application of UJT is in:

- (a) Clipping circuits
- (b) Sawtooth waveform generation
- (c) Voltage regulation
- (d) High-frequency amplification Answer: B

2547. UJT relaxation oscillator output is typically:

- (a) Square wave
- (b) Sine wave
- (c) Sawtooth wave
- (d) Triangular wave Answer: C

2548. UJT is preferred in triggering SCRs because of:

- (a) Low power consumption
- (b) High frequency output
- (c) Negative resistance region
- (d) High voltage gain Answer: C

2549. In a UJT, the intrinsic stand-off ratio is used to:

- (a) Set the cutoff current
- (b) Determine peak point voltage
- (c) Amplify input signals
- (d) Regulate voltage Answer: B

2550. Photo transistors are used in:

- (a) Voltage regulators
- (b) Light-sensitive switches
- (c) Oscillators
- (d) Transformers

Answer: B

2551. Photo transistor operates effectively in which region?

- (a) Cut-off
- (b) Active
- (c) Breakdown
- (d) Saturation

Answer: B

- 2552.** In a photo transistor, light increases:
- (a) Collector current
 - (b) Emitter voltage
 - (c) Resistance
 - (d) Power loss Answer: A
- 2553.** Which is NOT a common use of photo transistor?
- (a) Object detection
 - (b) Light sensing
 - (c) Audio amplification
 - (d) Optical Encoder feedback Answer: C
- 2554.** The main advantage of Darlington pair is:
- (a) Higher voltage rating
 - (b) Higher frequency response
 - (c) Very high current gain
 - (d) Temperature stability Answer: C
- 2555.** The current gain of a Darlington pair is approximately:
- (a) β
 - (b) 2β
 - (c) $\beta_1 + \beta_2$
 - (d) $\beta_1 \times \beta_2$ Answer: D
- 2556.** Darlington transistors are used in:
- (a) RF applications
 - (b) Power switching and amplifiers
 - (c) Oscillators
 - (d) Tuning circuits Answer: B
- 2557.** One drawback of Darlington pair is:
- (a) Very low gain
 - (b) Increased voltage drop (V_{BE})
 - (c) Reduced input impedance
 - (d) Low current handling Answer: B
- 2558.** SCR stands for:
- (a) Silicon Capacitor Resistor
 - (b) Silicon Controlled Rectifier
 - (c) Series Current Regulator
 - (d) Single Circuit Resistor Answer: B
- 2559.** How many terminals does an SCR have?
- A) 2
 - B) 3
 - C) 4
 - D) 5
- Answer: B

- 2560.** The three terminals of an SCR are:
- (a) Emitter, Base, Collector
 - (b) Gate, Drain, Source
 - (c) Anode, Cathode, Gate
 - (d) Source, Gate, Drain Answer: C
- 2561.** The SCR starts conducting when:
- (a) Voltage is applied across cathode
 - (b) Current is applied to anode
 - (c) Gate is triggered and forward voltage is applied
 - (d) Anode is grounded Answer: C
- 2562.** The SCR is a type of:
- (a) Unidirectional switch
 - (b) Amplifier
 - (c) Bipolar transistor
 - (d) Bidirectional device Answer: A
- 2563.** In reverse blocking mode of SCR:
- (a) Anode is positive w.r.t. cathode
 - (b) Cathode is positive w.r.t. anode
 - (c) SCR conducts fully
 - (d) SCR behaves like a short circuit
- Answer: B
- 2564.** Latching current is the minimum current in SCR to:
- (a) Turn ON SCR
 - (b) Keep SCR in OFF state
 - (c) Keep SCR conducting after gate pulse is removed
 - (d) Reverse bias the SCR
- Answer: C
- 2565.** Holding current is the minimum current in SCR to:
- (a) Keep SCR ON
 - (b) Maintain reverse bias
 - (c) Turn OFF the SCR after conduction
 - (d) Trigger the SCR
- Answer: A
- 2566.** Once an SCR is ON, it can be turned OFF by:
- (a) Reducing gate current
 - (b) Interrupting anode current below holding level
 - (c) Applying positive gate pulse
 - (d) Increasing anode current
- Answer: B
- 2567.** The SCR remains in conducting state until:
- (a) Gate voltage is removed
 - (b) Voltage is reversed
 - (c) Current falls below holding current

- (d) Cathode becomes positive Answer: C
- 2568.** Which is NOT a method of triggering an SCR?
- (a) Gate triggering
 - (b) dv/dt triggering
 - (c) Magnetic triggering
 - (d) Thermal triggering Answer: C
- 2569.** dv/dt triggering in SCR is due to:
- (a) Gate pulse
 - (b) Sudden increase in gate current
 - (c) Rapid change in anode voltage
 - (d) High holding current Answer: C
- 2570.** In line (natural) commutation, SCR turns off when:
- (a) Supply is removed
 - (b) Gate signal is reduced
 - (c) AC current passes through zero
 - (d) Voltage is reversed
- Answer: C
- 2571.** Forced commutation is mainly used in:
- (a) AC circuits
 - (b) High-frequency DC circuits
 - (c) Low-frequency AC motors
 - (d) Transformers Answer: B
- 2572.** Which commutation method is most commonly used in inverter circuits?
- (a) Class A
 - (b) Class C
 - (c) Class E
 - (d) Class B
- Answer: C
- 2573.** dv/dt rating indicates:
- (a) Rate of change of current
 - (b) Rate of temperature rise
 - (c) Rate of change of voltage
 - (d) Rate of gate triggering Answer: C
- 2574.** High dv/dt across SCR may cause:
- (a) Delay in conduction
 - (b) Reverse bias
 - (c) False triggering
 - (d) Decrease in holding current Answer: C
- 2575.** A snubber circuit is used to protect SCR from:
- (a) Low voltage
 - (b) Overcurrent
 - (c) dv/dt effect

(d) Gate noise Answer: C

2576. di/dt protection is usually provided using:

- (a) Capacitor in parallel
- (b) Fuse
- (c) Inductor in series
- (d) Resistor in gate circuit

Answer: C

2577. SCR requires a heat sink because:

- (a) It conducts at low temperature
- (b) It stores energy
- (c) It generates heat during conduction
- (d) It operates only when cool Answer: C

2578. SCR is NOT typically used in:

- (a) Motor speed control
- (b) AC voltage regulation
- (c) RF signal amplification
- (d) Phase control Answer: C

2579. A light-triggered SCR is called:

- (a) DIAC
- (b) LASCR
- (c) TRIAC
- (d) GTO

Answer: B

2580. Compared to TRIAC, SCR is:

- (a) Bidirectional
- (b) Unidirectional
- (c) Used in RF circuits
- (d) More commonly used in lamps Answer: B

2581. SCR is also known as a:

- (a) Voltage-controlled switch
- (b) Phase inverter
- (c) Thyristor
- (d) Transformer

Answer: C

2582. In a controlled rectifier using SCR, the firing angle controls:

- (a) Output frequency
- (b) Output voltage
- (c) Current gain
- (d) Efficiency Answer: B

2583. The firing angle of an SCR refers to:

- (a) The time it takes for the SCR to turn off
- (b) The voltage drop across the gate
- (c) The delay angle after the zero crossing at which SCR is triggered
- (d) The reverse bias voltage

Answer: C

2584. If the firing angle of an SCR in an AC half-wave rectifier is increased from 30° to 90° , the average output voltage will:

- (a) Increase
- (b) Remain the same
- (c) Decrease
- (d) Become zero

Answer: C

2585. In a single-phase full-wave controlled rectifier, if the firing angle is 180° , the output voltage is:

- (a) Maximum
- (b) Half of peak voltage
- (c) Zero
- (d) Negative

Answer: C

2586. Which component is commonly used to control the firing angle of an SCR?

- (a) Capacitor
- (b) Resistor
- (c) Pulse transformer
- (d) Triggering circuit or controller

Answer: D

2587. For an SCR to conduct in each cycle, the firing angle must be:

- (a) Greater than 180°
- (b) Less than or equal to 180°
- (c) Between 270° and 360°
- (d) Zero

Answer: B

2588. The input impedance of a FET is generally:

- (a) Low
- (b) Very high
- (c) Zero
- (d) Medium

Answer: B

2589. Which FET configuration has unity voltage gain?

- (a) Common Gate
- (b) Common Drain
- (c) Common Source
- (d) All of the above

Answer: B

2590. Which of the following can operate in both depletion and enhancement modes?

- (a) JFET
- (b) BJT
- (c) Depletion MOSFET
- (d) UJT

Answer: C

2591. FETs are better than BJTs for:

- (a) Low-frequency operation
- (b) Large current handling
- (c) Impedance matching and noise performance
- (d) Power amplification

Answer: C

2592. What protects a MOSFET from static damage?

- (a) Heat sink
- (b) Biasing resistors
- (c) Gate protection diode
- (d) Series inductor

Answer: C

2593. Which one is used in CMOS technology?

- (a) Only N-channel MOSFET
- (b) Only P-channel MOSFET
- (c) Both N-channel and P-channel
- (d) BJT

Answer: C

2594. MESFET stands for:

- (a) Metal Electron Semiconductor FET
- (b) Metal Semiconductor FET
- (c) Metal Electric Semiconductor FET
- (d) Metallic Enhanced Semiconductor FET

Answer: B

2595. CMOS is widely used in:

- (a) High-power applications
- (b) Digital integrated circuits
- (c) Audio frequency amplifiers
- (d) Electroplating

Answer: B

2596. Which transistor has better switching speed?

- (a) BJT
- (b) IGBT
- (c) MOSFET
- (d) UJT

Answer: C

2597. A key feature of CMOS is:

- (a) Low speed
- (b) Low static power consumption
- (c) High heat generation
- (d) High voltage drop

Answer: B

2598. The biggest disadvantage of MOSFET is:

- (a) High speed
- (b) Susceptibility to static charge
- (c) High power dissipation
- (d) Difficult biasing

Answer: B

2599. Which of the following is an advantage of ICs over discrete components?

- (a) Larger size
- (b) Higher power dissipation
- (c) Higher cost
- (d) Compactness and reliability

Answer: D

2600. In which type of IC fabrication are both active and passive components integrated on a single chip?

- (a) Hybrid
- (b) Thin film
- (c) Monolithic
- (d) Thick film

Answer: C

2601. Which parameter defines the ability of an Op-Amp to reject common-mode signals?

- (a) Slew Rate
- (b) Offset Voltage
- (c) Gain Bandwidth
- (d) CMRR

Answer: D

2602. In a practical application, a voltage follower (OPAMP) is used to:

- (a) Amplify input signal
- (b) Act as an oscillator
- (c) Provide high input and low output impedance
- (d) Perform differentiation

Answer: C

2603. In a summing amplifier using IC 741, the output is:

- (a) Equal to the average of input voltages
- (b) In phase with input
- (c) Inverted sum of inputs
- (d) Square of input voltages

Answer: C

2604. The 555 timer in astable mode is used for:

- (a) Generating a single pulse

- (b) Measuring temperature
 - (c) Generating continuous square waves
 - (d) Stabilizing voltage
- Answer: C

2605. In a monostable 555 timer application, the output is:

- (a) A continuous square wave
 - (b) A triangular wave
 - (c) A single pulse for each trigger
 - (d) Constant DC voltage
- Answer: C

2606. Which voltage regulator provides 5V output in a fixed regulator series?

- (a) 7809
- (b) 7812
- (c) 7905
- (d) 7805

Answer: D

2607. LM317 is best used for:

- (a) Fixed positive voltage
 - (b) Negative voltage
 - (c) Adjustable voltage regulation
 - (d) AC voltage control
- Answer: C

2608. Which logic family is best known for low power consumption?

- (a) ECL
- (b) TTL
- (c) CMOS
- (d) RTL

Answer: C

2609. In practical digital circuits, a NOT gate can be implemented using IC:

- (a) 7408
- (b) 7432
- (c) 7400
- (d) 7404

Answer: D

2610. The most accurate and fastest ADC type is:

- (a) Flash
- (b) Dual slope
- (c) Counter type
- (d) Successive approximation

Answer: A

2611. In a DAC, the R-2R ladder network is preferred because:

- (a) It uses transistors
- (b) It's compact and resistor values are easy to fabricate
- (c) It requires no power
- (d) It has zero output resistance

Answer: B

2612. Which IC is most suitable for designing a small audio amplifier?

- (a) 741
- (b) 7805
- (c) LM386
- (d) 555

Answer: C

2613. In sensor signal conditioning circuits, Op-Amps are mainly used for:

- (a) Current limiting
- (b) Signal amplification and filtering
- (c) Pulse width modulation
- (d) Heat dissipation

Answer: B

2614. Which of the following is a Linear IC?

- (a) 741 Op-Amp
- (b) 7400 NAND Gate
- (c) 7490 Decade Counter
- (d) 4011 CMOS Gate

Answer: A

2615. A digital IC primarily deals with:

- (a) Continuous signals
- (b) Discrete binary signals
- (c) Analog voltage variations
- (d) Sine wave generation

Answer: B) Discrete binary signals

2616. Which IC is classified under digital ICs?

- (a) LM317
- (b) LM741
- (c) 7408 AND Gate
- (d) LM386

Answer: C) 7408 AND Gate

2617. Linear ICs are commonly used in:

- (a) Counters
- (b) Amplifiers
- (c) Logic operations
- (d) Flip-flops

Answer: B) Amplifiers

2618. Which of the following IC packages has two parallel rows of pins?

- (a) DIP (Dual In-line Package)
- (b) SIP
- (c) BGA
- (d) SMD

Answer: A) DIP (Dual In-line Package)

2619. The main advantage of SMD (Surface Mount Device) packaging is:

- (a) Requires sockets
- (b) Difficult to place
- (c) Saves PCB space and suitable for automation
- (d) Used only in analog circuits

Answer: C) Saves PCB space and suitable for automation

2620. Which IC package is best suited for high pin count and heat dissipation in modern processors?

- (a) SIP
- (b) BGA (Ball Grid Array)
- (c) DIP
- (d) QFP

Answer: B) BGA (Ball Grid Array)

2621. Which IC package has a single row of pins and is often used in memory modules?

- (a) SIP (Single In-line Package)
- (b) QFP
- (c) DIP
- (d) BGA

Answer: A) SIP (Single In-line Package)

2622. The QFP (Quad Flat Package) is characterized by:

- (a) Pins on two sides
- (b) Pins on all four sides
- (c) No visible pins
- (d) Only for power ICs

Answer: B) Pins on all four sides

2623. Which of the following is NOT a surface-mount package?

- (a) QFP
- (b) BGA
- (c) DIP
- (d) SOT

Answer: C) DIP

2624. The IGBT is a combination of which two semiconductor devices?

- (a) BJT and SCR
- (b) MOSFET and BJT
- (c) Diode and MOSFET
- (d) FET and UJT

Answer: B) MOSFET and BJT

2625. The control input of an IGBT is:

- (a) Voltage-controlled
- (b) Current-controlled
- (c) Temperature-controlled
- (d) Light-controlled

Answer: A)

2626. Which application does NOT typically use IGBT?

- (a) Electric trains
- (b) Microwave ovens
- (c) Induction cooktops
- (d) High-speed RF amplifiers

Answer: D)

2627. One of the primary advantages of IGBT over BJT is:

- (a) Higher breakdown voltage
- (b) Lower cost
- (c) Simpler structure
- (d) Easy voltage control at the gate

Answer: D)

2628. A key limitation of IGBT is:

- (a) Low switching frequency
- (b) Poor thermal conductivity
- (c) High input current
- (d) High leakage current

Answer: A) Low switching frequency

2629. In automation, IGBT is most commonly used in:

- (a) Data acquisition systems
- (b) Programmable logic controllers
- (c) Variable frequency drives (VFDs)
- (d) Analog timers

Answer: C) Variable frequency drives (VFDs)

2630. Why are IGBTs preferred in CNC machines?

- (a) They are cheaper than BJTs
- (b) They are easy to cool
- (c) They provide efficient and reliable motor switching
- (d) They amplify analog signals

Answer: C) They provide efficient and reliable motor switching

2631. Compared to MOSFETs, IGBTs are more suitable for:

- (a) Low voltage applications
- (b) High-speed switching
- (c) High voltage and current applications
- (d) RF amplifiers

Answer: C) High voltage and current applications

2632. Among the following, which device generally has the **highest switching speed**?

- (a) IGBT
- (b) BJT
- (c) MOSFET
- (d) Thyristor

Answer: C) MOSFET

2633. In electric motor drives, IGBTs are preferred in inverters because:

- (a) They are purely analog devices
- (b) They can handle switching of large currents and voltages
- (c) They store electric charge
- (d) They act as transformers

Answer: B) They can handle switching of large currents and voltages

2634. The use of IGBTs in SMPS circuits is ideal due to:

- (a) Their resistance to humidity
- (b) Their ability to amplify low-frequency signals
- (c) Their fast switching and high efficiency
- (d) Their built-in transformers

Answer: C) Their fast switching and high efficiency

2635. What role does the IGBT play in a Variable Frequency Drive (VFD)?

- (a) Acts as a fuse for protection
- (b) Converts mechanical energy into electrical energy
- (c) Rapidly switches DC to convert to AC to control motor speed
- (d) Regulates oil pressure in hydraulics

Answer: C) Rapidly switches DC to convert to AC to control motor speed

2636. A VFD shows an overcurrent fault at startup. Which IGBT-related issue is the most likely cause?

- (a) Low input voltage
- (b) Capacitor failure in DC bus
- (c) IGBT short-circuit or gate drive fault
- (d) Faulty keypad

Answer: C) IGBT short-circuit or gate drive fault

2637. An IGBT in a VFD fails repeatedly. What is a common reason for repeated IGBT damage?

- (a) Overvoltage from input supply
- (b) Weak fan in the keypad
- (c) Loose mounting bolts
- (d) Low PWM frequency

Answer: A) Overvoltage from input supply

2638. If a VFD's output is completely dead, but input and DC bus are normal, what should be checked first?

- (a) Fuse at input terminal
- (b) Motor winding resistance
- (c) Output IGBTs and gate driver circuit
- (d) Keypad display contrast

Answer: C) Output IGBTs and gate driver circuit

2639. What is the likely symptom of an open (not switching) IGBT in a VFD?

- (a) VFD powers off completely
- (b) DC bus voltage becomes negative
- (c) One output phase is missing or voltage is low

(d) Keypad shows no error
Answer: C) One output phase is missing or voltage is low

2640. IGBT failure in a VFD may result in which of the following warning/error messages?

- (a) EEPROM Error
- (b) Over Temperature or Output Short Circuit
- (c) Modbus Communication Failure
- (d) Low Motor Speed

Answer: B) Over Temperature or Output Short Circuit

2641. Repeated tripping on “IGBT Desaturation” in a VFD usually means:

- (a) The IGBTs are saturated and working normally
- (b) The IGBT is not turning on fully or is damaged
- (c) The cooling fan is oversized
- (d) The input frequency is too high

Answer: B) The IGBT is not turning on fully or is damaged

2642. What can cause IGBT overheating in a VFD during normal operation?

- (a) Low ambient temperature
- (b) Proper heat sink connection
- (c) Inadequate cooling or heatsink contact
- (d) Perfect PWM control

Answer: C) Inadequate cooling or heatsink contact

2643. A VFD shows erratic behavior during switching. The most probable issue with the IGBT gate drive is:

- (a) Constant ON signal
- (b) Floating gate signal or noise
- (c) Zero voltage at collector
- (d) Open motor terminal

Answer: B) Floating gate signal or noise

2644. The main function of a rectifier is to:

- (a) Convert DC to AC
- (b) Filter AC voltage
- (c) Convert AC to DC
- (d) Step up voltage

Answer: C) Convert AC to DC

2645. Rectifiers are widely used in:

- (a) Oscillators
- (b) Power supply units
- (c) RF communication
- (d) Audio amplifiers

Answer: B) Power supply units

2646. A half-wave rectifier conducts for how much of the input AC cycle?

- (a) 100%
- (b) 50%
- (c) 25%

(d) 75%
Answer: B) 50%

2647. A full-wave bridge rectifier requires how many diodes?

- A) 1
- B) 2
- C) 3
- D) 4

Answer: D) 4

2648. The main advantage of full-wave rectification over half-wave is:

- (a) Lower PIV
- (b) Higher ripple
- (c) Higher efficiency and smoother DC
- (d) Less number of components

Answer: C) Higher efficiency and smoother DC

2649. In a center-tap full-wave rectifier, the PIV across each diode is:

- (a) V_m
- (b) $2V_m$
- (c) $V_m/2$
- (d) Zero

Answer: b

2650. Ripple factor for a full-wave rectifier is approximately:

- (a) 1.21
- (b) 0.482
- (c) 0.707
- (d) 0

Answer: B) 0.482

2651. The efficiency of a full-wave rectifier without filter is about:

- (a) 40.6%
- (b) 50%
- (c) 81.2%
- (d) 100%

Answer: C) 81.2%

2652. Peak Inverse Voltage (PIV) for a rectifier is is:

- (a) The voltage drop across the diode when it conducts
- (b) The average voltage
- (c) The maximum reverse voltage a diode can withstand
- (d) Always equal to zero

Answer: C) The maximum reverse voltage a diode can withstand

2653. A capacitor filter is most effective when connected:

- (a) In series with load
- (b) In parallel across the diode
- (c) Across the output of rectifier

(d) In the input of transformer

Answer: C) Across the output of rectifier

2654. Which filter type provides the smoothest DC output?

(a) Capacitor only

(b) Inductor only

(c) LC filter

(d) π (pi) filter

Answer: D) π (pi) filter

2655. The purpose of filters in rectifier circuits is to:

(a) Increase voltage

(b) Reduce current

(c) Reduce ripple

(d) Act as a switch

Answer: C) Reduce ripple

2656. Compared to a half-wave rectifier, a full-wave rectifier has:

(a) Lower efficiency

(b) Higher ripple

(c) Better transformer utilization

(d) More voltage drop

Answer: C) Better transformer utilization

2657. A bridge rectifier is preferred over center-tap because:

(a) It uses fewer diodes

(b) It requires a special transformer

(c) It provides full-wave rectification without center-tap

(d) It works only on DC

Answer: C) It provides full-wave rectification without center-tap

2658. Which of the following devices is most likely to have a rectifier inside?

(a) Electric heater

(b) Solar panel

(c) Laptop charger

(d) Induction motor

Answer: C)

2659. In battery chargers, rectifiers are used to:

(a) Convert AC to pulsating DC

(b) Increase the voltage

(c) Store energy

(d) Filter the current

Answer: A) Convert AC to pulsating DC

2660. A full-wave rectifier with centre-tap uses how many diodes?

A) 1

B) 2

C) 3

D) 4

Answer: B) 2

2661. The centre-tap transformer is used in full-wave rectification to:

- (a) Step down voltage
- (b) Provide two equal & opposite voltages for diode operation
- (c) Filter output
- (d) Increase ripple

Answer: B) Provide two equal & opposite voltages for diode operation

2662. The PIV rating of each diode in a centre-tap full-wave rectifier is:

- (a) V_m
- (b) $2V_m$
- (c) $V_m/2$
- (d) Zero

Answer: b

2663. A full-wave bridge rectifier requires:

- (a) One diode
- (b) Two diodes and centre-tap
- (c) Four diodes and no centre-tap
- (d) Two diodes and a filter

Answer: C) Four diodes and no centre-tap

2664. What is the advantage of a bridge rectifier over centre-tap full-wave rectifier?

- (a) Lower efficiency
- (b) Higher PIV
- (c) No need for centre-tap transformer
- (d) More ripple

Answer: C) No need for centre-tap transformer

2665. A capacitor filter is usually connected in rectifier :

- (a) In series with the load
- (b) In parallel with the output
- (c) Across the transformer
- (d) In the gate circuit

Answer: B) In parallel with the output

2666. What effect does increasing capacitance in a rectifier circuit have on ripple?

- (a) Ripple increases
- (b) Ripple remains the same
- (c) Ripple decreases
- (d) No effect

Answer: C) Ripple decreases

2667. In a power supply circuit, rectifier section , the inductor filter is usually connected:

- (a) In series with load
- (b) In parallel with input
- (c) In parallel with load

(d) Across the transformer

Answer: A) In series with load

2668. In rectifiers, An LC filter is more effective than a capacitor-only filter because:

- (a) It increases voltage
- (b) It allows both AC and DC
- (c) It suppresses both voltage and current ripple
- (d) It works at all frequencies

Answer: C) It suppresses both voltage and current ripple

2669. A rectifier used in welding equipment fails frequently. What might be the reason?

- (a) Low AC input
 - (b) Overcurrent or poor cooling
 - (c) Use of soft iron core
 - (d) Rectifier placement too far from the load
- Answer:** B) Overcurrent or poor cooling

2670. The ability of an amplifier to handle different frequencies is termed as amplifiers :

- (a) Distortion
- (b) Linearity
- (c) Bandwidth
- (d) Feedback

Answer: C) Bandwidth

2671. Which class of amplifier has the lowest efficiency?

- (a) Class A
- (b) Class B
- (c) Class C
- (d) Class D

Answer: A) Class A

2672. The maximum theoretical efficiency of a Class B amplifier is:

- (a) 25%
- (b) 50%
- (c) 78.5%
- (d) 100%

Answer: C) 78.5%

2673. An amplifier is said to be linear if:

- (a) Output is sinusoidal
- (b) Gain is constant for all frequencies
- (c) Output is directly proportional to input
- (d) It consumes more power

Answer: C) Output is directly proportional to input

2674. For an amplifier, Frequency response is a plot between:

- (a) Gain vs. Time
- (b) Power vs. Resistance
- (c) Gain vs. Frequency
- (d) Voltage vs. Current

Answer: C) Gain vs. Frequency

2675. Which class of amplifier has the highest linearity but lowest efficiency?

- (a) Class A
- (b) Class B
- (c) Class C
- (d) Class AB

Answer: A) Class A

2676. Class B amplifiers conduct for how much of the input signal?

- (a) 90°
- (b) 180°
- (c) 270°
- (d) 360°

Answer: B) 180°

2677. A push-pull amplifier is used to:

- (a) Reduce output power
- (b) Increase distortion
- (c) Eliminate even harmonics
- (d) Increase frequency

Answer: C) Eliminate even harmonics

2678. Which amplifier class is most efficient but highly nonlinear?

- (a) Class A
- (b) Class B
- (c) Class AB
- (d) Class C

Answer: D) Class C

2679. The main advantage of Class AB amplifier over Class B is:

- (a) Higher efficiency
- (b) Simpler circuit
- (c) Reduced crossover distortion
- (d) Lower cost

Answer: C) Reduced crossover distortion

2680. A push-pull amplifier requires:

- (a) Two transistors working alternately
- (b) A single transistor in saturation
- (c) Constant DC bias
- (d) Only resistive components

Answer: A) Two transistors working alternately

2681. The output stage of a power amplifier is designed for:

- (a) Minimum distortion
- (b) Maximum gain
- (c) Maximum power transfer to load
- (d) High input resistance

Answer: C) Maximum power transfer to load

2682. Which amplifier class is ideal for high-fidelity (audio) systems?

- (a) Class C
- (b) Class B
- (c) Class A
- (d) Class D

Answer: C) Class A

2683. Class C amplifiers are mainly used for:

- (a) Audio amplification
- (b) RF transmission
- (c) Signal modulation
- (d) Microphone preamps

Answer: B) RF transmission

2684. Which of the following best describes Class C amplifiers?

- (a) High linearity, low efficiency
- (b) High efficiency, high distortion
- (c) Medium efficiency, low distortion
- (d) Low gain, high power consumption

Answer: B) High efficiency, high distortion

2685. Which component is typically used to restore the signal shape in a Class C amplifier?

- (a) Resistor
- (b) Inductor
- (c) LC Tank Circuit
- (d) Transformer

Answer: C) LC Tank Circuit

2686. The efficiency of a well-designed Class D amplifier is usually:

- (a) Below 40%
- (b) Around 60%
- (c) Around 78%
- (d) Over 90%

Answer: D) Over 90%

2687. The common emitter amplifier is widely used because:

- (a) It has high voltage gain only
- (b) It has high input impedance
- (c) It offers both voltage and current gain
- (d) It inverts the signal twice

Answer: C) It offers both voltage and current gain

2688. The phase shift between input and output in a CE amplifier is:

- (a) 0°
- (b) 90°
- (c) 180°
- (d) 270°

Answer: C) 180°

2689. In a CE amplifier, the input is applied to:

- (a) Base and collector
- (b) Emitter and base
- (c) Collector and base
- (d) Collector and emitter

Answer: B) Emitter and base

2690. The input impedance of a CB amplifier is:

- (a) Very high
- (b) Moderate
- (c) Very low
- (d) Infinite

Answer: C) Very low

2691. The current gain (β) in a CB amplifier is approximately:

- (a) < 1
- (b) Equal to 1
- (c) Much greater than 1
- (d) Infinite

Answer: A) < 1

2692. CB amplifiers are mainly used for:

- (a) High input impedance
- (b) High voltage amplification
- (c) High-frequency applications
- (d) Low-frequency filtering

Answer: C) High-frequency applications

2693. The voltage gain of a CC amplifier is approximately:

- (a) > 100
- (b) 0
- (c) 1
- (d) Infinity

Answer: C) 1

2694. CC amplifiers are typically used as:

- (a) Oscillators
- (b) Voltage amplifiers
- (c) Buffers or impedance matching stages
- (d) Filters

Answer: C) Buffers or impedance matching stages

2695. The phase shift between input and output in a CC amplifier is:

- (a) 0°
- (b) 90°
- (c) 180°
- (d) 360°

Answer: A) 0°

2696. Which configuration provides the highest voltage gain?

- (a) CE
- (b) CB
- (c) CC
- (d) None

Answer: A) CE

2697. Which configuration has the highest input impedance?

- (a) CB
- (b) CE
- (c) CC
- (d) All equal

Answer: C)

2698. Which configuration is best suited for impedance matching?

- (a) Common Emitter
- (b) Common Base
- (c) Common Collector
- (d) All of the above

Answer: C) Common Collector

2699. In Amplifiers, Transformer coupling is often used when:

- (a) High voltage gain is required
- (b) Large DC biasing is needed
- (c) High-frequency signals are involved
- (d) High current gain is required

Answer: C) High-frequency signals are involved

2700. The main advantage of transformer coupling in amplifier configuration is:

- (a) Simplicity in design
- (b) Very low cost
- (c) Improved impedance matching
- (d) High gain with no distortion

Answer: C) Improved impedance matching

2701. The overall voltage gain of a multistage amplifier is:

- (a) The sum of the gains of each stage
- (b) The product of the gains of each stage
- (c) The average of the gains of each stage
- (d) The maximum gain of any one stage

Answer: B) The product of the gains of each stage

2702. The frequency response of a multistage amplifier can be improved by:

- (a) Decreasing the size of the coupling capacitors
- (b) Using larger resistors in the circuit
- (c) Ensuring the stages have similar bandwidths

- (d) Increasing the number of stages

Answer: C) Ensuring the stages have similar bandwidths

2703. Negative feedback in amplifiers:

- (a) Increases distortion
- (b) Reduces gain
- (c) Reduces bandwidth
- (d) Causes oscillation

Answer: B) Reduces gain

2704. The main benefit of negative feedback is:

- (a) More noise
- (b) Higher cost
- (c) Improved stability and bandwidth
- (d) Higher input impedance only

Answer: C) Improved stability and bandwidth

2705. A differential amplifier amplifies:

- (a) The average of two inputs
- (b) The sum of two inputs
- (c) The difference between two inputs
- (d) Only the first input

Answer: C) The difference between two inputs

2706. A high CMRR in a differential amplifier means:

- (a) Good rejection of common signals
- (b) High output power
- (c) Low bandwidth
- (d) Unstable gain

Answer: A) Good rejection of common signals

2707. In a differential amplifier, if the input signals are identical, the output will be:

- (a) Zero
- (b) Amplified
- (c) A direct copy of the input
- (d) Inverted

Answer: A) Zero

2708. The main use of a differential amplifier is in:

- (a) Audio amplification
- (b) Measuring the difference between two voltages
- (c) Filtering high-frequency noise
- (d) Digital signal processing

Answer: B) Measuring the difference between two voltages

2709. The gain of a differential amplifier is:

- (a) Constant for all input voltages
- (b) Independent of the signal frequency

- (c) Proportional to the difference between the inputs
- (d) Dependent on the output impedance

Answer: C) Proportional to the difference between the inputs

2710. A higher CMRR indicates:

- (a) The amplifier is more sensitive to common-mode signals
- (b) The amplifier is less sensitive to common-mode signals
- (c) The amplifier has low voltage gain
- (d) The amplifier works better with digital signals

Answer: B) The amplifier is less sensitive to common-mode signals

2711. A typical application of differential amplifiers with high CMRR is:

- (a) Power amplifiers
- (b) Instrumentation amplifiers
- (c) Audio signal processing
- (d) Digital logic circuits

Answer: B) Instrumentation amplifiers

2712. The CMRR value for an ideal differential amplifier is:

- (a) 1
- (b) Infinite
- (c) 0
- (d) 100

Answer: B) Infinite

2713. A basic operational amplifier (Op-Amp) has:

- (a) High input impedance and low output impedance
- (b) Low input impedance and high output impedance
- (c) Low input and output impedance
- (d) Equal input and output impedance

Answer: A) High input impedance and low output impedance

2714. The voltage gain of an ideal Op-Amp is:

- (a) Zero
- (b) Finite but very high
- (c) Infinite
- (d) Dependent on the frequency

Answer: C) Infinite

2715. In a non-inverting amplifier configuration, the input signal is applied to the:

- (a) Inverting terminal
- (b) Non-inverting terminal
- (c) Both terminals equally
- (d) Ground

Answer: B) Non-inverting terminal

2716. Which of the following is a key characteristic of an ideal operational amplifier?

- (a) Infinite bandwidth

- (b) Zero input offset voltage
- (c) Infinite open-loop gain
- (d) All of the above

Answer: D) All of the above

2717. Which of the following uses amplifiers extensively?

- (a) Cooking appliances
- (b) Thermostats
- (c) Audio systems
- (d) Washing machines

Answer: C) Audio systems

2718. Amplifiers are used in communication systems for:

- (a) Interference
- (b) Attenuation
- (c) Signal boosting
- (d) Filtering only

Answer: C) Signal boosting

2719. Which amplifier is commonly used at the transmitting end of communication systems?

- (a) Power amplifier
- (b) Buffer amplifier
- (c) Audio amplifier
- (d) Op-amp

Answer: A) Power amplifier

2720. What is the main function of an oscillator?

- (a) Amplify a signal
- (b) Convert DC to AC without input signal
- (c) Rectify AC
- (d) Store electric energy

Answer: B) Convert DC to AC without input signal

2721. An oscillator differs from an amplifier because:

- (a) It consumes more power
- (b) It does not require feedback
- (c) It generates its own input signal
- (d) It only works with AC supply

Answer: C) It generates its own input signal

2722. Which of the following waveforms is typically produced by a sinusoidal oscillator?

- (a) Square wave
 - (b) Sine wave
 - (c) Sawtooth wave
 - (d) Pulse wave
- Answer:**
B) Sine wave

2723. What type of waveform does a relaxation oscillator usually produce?

- (a) Sinusoidal

- (b) Triangular
- (c) Square or sawtooth
- (d) Continuous DC

Answer: C) Square or sawtooth

2724. The purpose of feedback in an oscillator is to:

- (a) Increase the gain
- (b) Produce stable DC output
- (c) Maintain sustained oscillations
- (d) Filter noise

Answer: C) Maintain sustained oscillations

2725. Which of the following is a sinusoidal oscillator?

- (a) Astable multivibrator
- (b) Colpitts oscillator
- (c) Schmitt trigger
- (d) Square wave generator

Answer: B) Colpitts oscillator

2726. An oscillator that generates square waves is classified as:

- (a) Sinusoidal oscillator
- (b) Relaxation oscillator
- (c) Harmonic oscillator
- (d) Linear oscillator

Answer: B) Relaxation oscillator

2727. What type of feedback is used in oscillators to sustain oscillations?

- (a) Negative feedback
- (b) Positive feedback
- (c) No feedback
- (d) Dual feedback

Answer: B) Positive feedback

2728. Which of the following frequency ranges corresponds to RF oscillators?

- (a) Below 20 Hz
- (b) 20 Hz – 20 kHz
- (c) 20 kHz – 300 GHz
- (d) Above 1 THz

Answer: C) 20 kHz – 300 GHz

2729. An oscillator operating at audio frequencies typically covers:

- (a) 1 Hz – 10 Hz
- (b) 20 Hz – 20 kHz
- (c) 100 kHz – 1 MHz
- (d) 1 MHz – 100 MHz

Answer: B) 20 Hz – 20 kHz

2730. An example of an oscillator that uses **positive feedback** is:

- (a) RC phase shift oscillator

- (b) Hartley oscillator
- (c) Voltage-controlled oscillator (VCO)
- (d) All of the above

Answer: D) All of the above

2731. What is the primary difference between positive feedback and negative feedback in oscillators?

- (a) Positive feedback amplifies the signal, while negative feedback reduces it.
- (b) Positive feedback & negative feedback destabilizes oscillations.
- (c) Positive feedback decreases the gain, while negative feedback increases it.
- (d) Negative feedback increases the amplitude, while positive feedback reduces it.

Answer: A) Positive feedback amplifies the signal, while negative feedback reduces it.

2732. Which of the following is a key requirement for sustained oscillations in an oscillator circuit?

- (a) Zero loop gain
- (b) Negative feedback
- (c) Positive feedback with the correct phase shift
- (d) Amplifier with an infinite gain

Answer: C) Positive feedback with the correct phase shift

2733. According to the **Barkhausen criterion**, the total phase shift around the feedback loop for oscillators must be:

- (a) 90°
- (b) 180°
- (c) 360° (or 0°)
- (d) 270°

Answer: C) 360° (or 0°)

2734. The **Barkhausen criterion** states that for an oscillator to start and sustain, the loop gain must be:

- (a) Greater than 1
- (b) Equal to 1
- (c) Less than 1
- (d) Equal to 0

Answer: B) Equal to 1

2735. Which of the following components are typically used to achieve the correct **phase shift** for oscillations?

- (a) Resistors and capacitors
- (b) Inductors and resistors
- (c) Capacitors and operational amplifiers
- (d) Both inductors and capacitors

Answer: A) Resistors and capacitors

2736. For an oscillator to function, the **loop gain** (product of amplifier gain and feedback network gain) must be:

- (a) Always less than 1

- (b) Exactly 1
- (c) Greater than 1
- (d) Always equal to 0

Answer: B) Exactly 1

2737. What is the significance of the **phase shift** in oscillator circuits?

- (a) It determines the waveform type (sinusoidal or square).
- (b) It controls the frequency of the oscillation.
- (c) It ensures that the feedback signal reinforces the input signal.
- (d) It determines the amplitude of the output signal.

Answer: C) It ensures that the feedback signal reinforces the input signal.

2738. The phase shift requirement for a **Wien bridge oscillator** is:

- (a) 180°
- (b) 90°
- (c) 360° (0°)
- (d) 270°

Answer: C) 360° (0°)

2739. The loop gain condition for oscillation is that the total gain in the feedback loop must be:

- (a) Less than 1 to avoid distortion
- (b) Exactly 1 to maintain oscillations
- (c) Equal to infinity to generate a high output
- (d) Negative to stop oscillations

Answer: B) Exactly 1 to maintain oscillations

2740. In a **Colpitts oscillator**, the total phase shift at the frequency of oscillation is:

- (a) 180°
- (b) 360°
- (c) 90°
- (d) 270°

Answer: B) 360°

2741. The **Barkhausen criterion** helps in determining:

- (a) The minimum voltage required for the oscillator to start
- (b) The phase shift conditions for the oscillator
- (c) The stability of the oscillator
- (d) The frequency range of the oscillator

Answer: B) The phase shift conditions for the oscillator

2742. Which of the following is the main component of a Wien Bridge Oscillator?

- (a) Inductor
 - (b) Capacitor
 - (c) Resistor
 - (d) Both resistors and capacitors
- Answer:** D) Both resistors and capacitors

2743. The frequency of oscillation for a Wien Bridge Oscillator is determined by:

- (a) The gain of the amplifier only
- (b) The feedback network resistors and capacitors

- (c) The power supply voltage
- (d) The size of the inductor

Answer: B) The feedback network resistors and capacitors

2744. In a Colpitts Oscillator, the feedback network consists of:

- (a) Two capacitors and one inductor
- (b) One capacitor and two inductors
- (c) One resistor and one capacitor
- (d) Two inductors and one capacitor

Answer: A) Two capacitors and one inductor

2745. The Hartley Oscillator is different from the Colpitts oscillator because it uses:

- (a) A resistor-capacitor network for feedback
- (b) An inductive voltage divider for feedback
- (c) A single inductor and two capacitors for feedback
- (d) A combination of resistors and inductors

Answer: B) An inductive voltage divider for feedback

2746. Which of the following is a characteristic of the RC Phase Shift Oscillator?

- (a) Uses only inductors for feedback
 - (b) Provides a high-frequency output
 - (c) Requires three RC stages for a total phase shift of 180°
 - (d) The frequency of oscillation is determined only by resistors
- Answer: C)
Requires three RC stages for a total phase shift of 180°

2747. The output waveform of a sinusoidal oscillator is generally:

- (a) Square wave
- (b) Sine wave
- (c) Triangular wave
- (d) Sawtooth wave

Answer: B) Sine wave

2748. The frequency of oscillation of a Colpitts Oscillator is determined by:

- (a) The values of the capacitors and the inductor in the tank circuit
- (b) The power supply voltage
- (c) The resistor in the feedback network
- (d) The gain of the operational amplifier

Answer: A) The values of the capacitors and the inductor in the tank circuit

2749. In a Wien Bridge Oscillator, the circuit stabilizes the amplitude of the oscillations by:

- (a) Automatic gain control
- (b) Variable resistors in the feedback loop
- (c) Fixed capacitors
- (d) Increasing the gain continuously

Answer: A) Automatic gain control

2750. The condition for sustained oscillations in a Colpitts Oscillator is that the phase shift around the feedback loop must be:

- (a) 180°
- (b) 360°
- (c) 90°

(d) 270°

Answer: B) 360°

2751. The RC Phase Shift Oscillator is often used for:

- (a) High-frequency RF applications
- (b) Low-frequency signal generation
- (c) Digital clock generation
- (d) Modulation and demodulation

Answer: B) Low-frequency signal generation

2752. The Colpitts oscillator is a type of:

- (a) RC oscillator
- (b) LC oscillator
- (c) Crystal oscillator
- (d) Relaxation oscillator

Answer: B) LC oscillator

2753. In an **inductive proximity sensor**, the **oscillator's** role is to:

- (a) Detect objects without generating a signal
- (b) Create a magnetic field that is altered when a metal object enters the field
- (c) Convert the object's position into a digital signal
- (d) Regulate the sensitivity of the sensor to temperature

Answer: B) Create a magnetic field that is altered when a metal object enters the field

2754. Which of the following is an advantage of the **RC Phase Shift Oscillator**?

- (a) It can operate at high frequencies
- (b) It is easy to design and build
- (c) It requires a complex feedback network
- (d) It uses a crystal for frequency stability

Answer: B) It is easy to design and build

2755. The **Hartley Oscillator** is primarily classified as a:

- (a) RC oscillator
- (b) LC oscillator
- (c) Crystal oscillator
- (d) Relaxation oscillator

Answer: B) LC oscillator

2756. The **frequency of oscillation** in a **Hartley Oscillator** is determined by:

- (a) The values of the resistors and capacitors
- (b) The inductance and capacitance in the feedback network
- (c) The feedback phase shift
- (d) The gain of the amplifier

Answer: B) The inductance and capacitance in the feedback network

2757. The feedback network in a **Hartley Oscillator** is based on:

- (a) A capacitive divider
- (b) A resistive divider
- (c) An inductive voltage divider

- (d) A combination of resistors and capacitors

Answer: C) An inductive voltage divider

2758. A **crystal oscillator** typically uses a **piezoelectric crystal**. The piezoelectric effect is used to:

- (a) Amplify the signal
- (b) Convert mechanical vibrations into an electrical signal
- (c) Regulate the current through the oscillator
- (d) Create the feedback network

Answer: B) Convert mechanical vibrations into an electrical signal

2759. Which of the following is the most commonly used material for crystals in oscillators?

- (a) Quartz
- (b) Sapphire
- (c) Gallium arsenide
- (d) Silicon carbide

Answer: A) Quartz

2760. The **fundamental frequency** of a **crystal oscillator** is determined by:

- (a) The size and shape of the crystal
- (b) The temperature of the oscillator
- (c) The gain of the oscillator circuit
- (d) The resonant frequency of the amplifier

Answer: A) The size and shape of the crystal

2761. Which of the following oscillators provides the most **stable frequency output**?

- (a) RC Oscillator
- (b) LC Oscillator
- (c) Crystal Oscillator
- (d) Hartley Oscillator

Answer: C) Crystal Oscillator

2762. The **Wein Bridge Oscillator** is primarily used for generating:

- (a) High-frequency RF signals
- (b) Low-frequency audio signals
- (c) Microwave signals
- (d) Square waves

Answer: B) Low-frequency audio signals

2763. Which oscillator type is typically used in **audio frequency** applications?

- (a) Crystal Oscillator
- (b) Wein Bridge Oscillator
- (c) LC Oscillator
- (d) Hartley Oscillator

Answer: B) Wein Bridge Oscillator

2764. The **Hartley Oscillator** uses which of the following components to determine the frequency?

- (a) A crystal
- (b) A capacitor and an inductor
- (c) An operational amplifier

- (d) A resistor and a capacitor

Answer: B) A capacitor and an inductor

2765. The **Crystal Oscillator** is commonly used for:

- (a) Low-frequency signal generation
- (b) High-precision clock generation
- (c) Amplification
- (d) Modulation and demodulation

Answer: B) High-precision clock generation

2766. Which oscillator type requires an **operational amplifier** to control gain for sustained oscillations?

- (a) Hartley Oscillator
- (b) Wein Bridge Oscillator
- (c) Colpitts Oscillator
- (d) RC Phase Shift Oscillator

Answer: B) Wein Bridge Oscillator

2767. In an **LC Oscillator**, the frequency is determined by:

- (a) The size and shape of the crystal
- (b) The inductance and capacitance in the circuit
- (c) The gain of the operational amplifier
- (d) The resistor values in the network

Answer: B) The inductance and capacitance in the circuit

2768. Which of the following is true for a **Wein Bridge Oscillator**?

- (a) It is used for generating very high frequencies
- (b) It uses an op-amp and a feedback network to generate sine waves
- (c) It is primarily used in RF communication
- (d) It requires a crystal for frequency determination

Answer: B) It uses an op-amp and a feedback network to generate sine waves

2769. The **RC Phase Shift Oscillator** is primarily used for:

- (a) Audio signal generation
- (b) High-frequency RF applications
- (c) Microwave signal generation
- (d) Communication systems

Answer: A) Audio signal generation

2770. Which oscillator is considered **most stable** for generating a **high-precision frequency** over time?

- (a) RC Oscillator
- (b) Hartley Oscillator
- (c) Colpitts Oscillator
- (d) Crystal Oscillator

Answer: D) Crystal Oscillator

2771. Which of the following is a typical application of a **Schmitt Trigger Oscillator**?

- (a) Audio frequency generation
- (b) Timing circuits

- (c) High-frequency signal generation
- (d) Digital signal amplification

Answer: B) Timing circuits

2772. In a **Relaxation Oscillator**, the output waveform is typically:

- (a) Sine wave
- (b) Triangular wave
- (c) Square wave
- (d) Sawtooth wave

Answer: C) Square wave

2773. Oscillators are used in function generators primarily to:

- (a) Store digital data
- (b) Generate periodic waveforms like sine, square, and triangle
- (c) Amplify weak signals
- (d) Rectify AC signals

Answer: B) Generate periodic waveforms like sine, square, and triangle

2774. In communication systems, oscillators are essential for:

- (a) Battery charging
- (b) Frequency modulation and demodulation
- (c) File storage
- (d) Signal distortion

Answer: B) Frequency modulation and demodulation

2775. Which type of oscillator is commonly used in radio transmitters for carrier wave generation?

- (a) RC Oscillator
- (b) LC Oscillator
- (c) Wein Bridge Oscillator
- (d) Schmitt Trigger Oscillator

Answer: B) LC Oscillator

2776. In digital systems, oscillators are mainly used to:

- (a) Perform arithmetic operations
- (b) Provide timing or clock signals
- (c) Encode data
- (d) Increase power output

Answer: B) Provide timing or clock signals

2777. The clock oscillator in a digital system provides:

- (a) A DC voltage reference
- (b) A time-varying control voltage
- (c) A stable timing signal to synchronize data flow
- (d) A memory refresh circuit

Answer: C) A stable timing signal to synchronize data flow

2778. Which of the following oscillator types is best suited for stable clock generation in microcontrollers?

- (a) Hartley Oscillator

- (b) RC Phase Shift Oscillator
 - (c) Crystal Oscillator
 - (d) Colpitts Oscillator
- Answer: C) Crystal Oscillator

2779. Function generators rely on oscillators to:

- (a) Demodulate RF signals
- (b) Produce variable frequency and waveform signals
- (c) Filter DC from AC
- (d) Increase transmission power

Answer: B) Produce variable frequency and waveform signals

2780. A Crystal Oscillator is preferred in communication receivers because of its:

- (a) Low cost
 - (b) High output power
 - (c) High frequency stability
 - (d) Low voltage requirement
- Answer: C) High frequency stability

2781. Oscillators used in timing circuits are required to have:

- (a) Adjustable phase shift
- (b) Frequency stability over time
- (c) High amplitude gain
- (d) High power dissipation

Answer: B) Frequency stability over time

2782. The oscillator in a wireless transmitter helps in:

- (a) Cleaning the signal
- (b) Amplifying the modulated signal
- (c) Generating the carrier signal
- (d) Receiving remote data

Answer: C) Generating the carrier signal

2783. The **Quality Factor (Q)** of an oscillator is a measure of:

- (a) Power output
- (b) Input resistance
- (c) Frequency selectivity and energy loss
- (d) Temperature coefficient

Answer: C) Frequency selectivity and energy loss

2784. A **high-Q oscillator** is desirable because it:

- (a) Consumes more power
- (b) Has higher waveform distortion
- (c) Produces purer sine waves with narrow bandwidth
- (d) Is easier to tune

Answer: C) Produces purer sine waves with narrow bandwidth

2782. Which logic gate gives a HIGH output only when both inputs are HIGH?

- a) OR
- b) AND

c) XOR

d) NOT

Answer: b) AND

2783. The output of a NOT gate is:

a) Always HIGH

b) Always LOW

c) Same as input

d) Complement of input

Answer: d) Complement of input

2784. Which of the following is a universal gate?

a) AND

b) OR

c) NOT

d) NAND

Answer: d) NAND

2785. What is the output of an OR gate when both inputs are LOW?

a) HIGH

b) LOW

c) Same as input

d) Cannot be determined

Answer: b) LOW

2786. Which gate has the output true only when the inputs are different?

a) XNOR

b) XOR

c) NAND

d) NOR

Answer: b) XOR

2787. The Boolean expression for a NOR gate is:

a) $A + B$

b) $(A + B)'$

c) AB

d) $(AB)'$

Answer: b) $(A + B)'$

2788. How many possible input combinations exist for a 3-input AND gate?

a) 4

b) 6

c) 8

d) 16

Answer: c) 8

2789. What logic gate is represented by the equation $Y = A \oplus B$?

a) AND

b) XOR

- c) NOR
 - d) NAND
- Answer: b) XOR

2790. Which gate is equivalent to an AND gate followed by a NOT gate?

- a) OR
- b) NAND
- c) NOR
- d) XOR

Answer: b) NAND

2791. The IC number for a quad 2-input AND gate is:

- a) 7400
- b) 7408
- c) 7432
- d) 7486

Answer: b) 7408

2792. Which of the following logic gates can be used to implement all other logic gates?

- a) AND and OR
- b) NOT and AND
- c) XOR and XNOR
- d) NAND and NOR

Answer: d) NAND and NOR

2793. A NAND gate is equivalent to an AND gate followed by a:

- a) NOR gate
- b) OR gate
- c) NOT gate
- d) XOR gate

Answer: c) NOT gate

2794. What will be the output of a NAND gate if both inputs are HIGH?

- a) HIGH
- b) LOW
- c) Same as input
- d) Indeterminate

Answer: b) LOW

2795. How can a NOT gate be constructed using a NAND gate?

- a) Connect both inputs together
 - b) Connect output to one input
 - c) Leave one input open
 - d) Use an AND gate in series
- Answer: a) Connect both inputs together

2796. A NOR gate gives HIGH output only when:

- a) All inputs are LOW
- b) All inputs are HIGH

- c) One input is HIGH
 - d) Both inputs are different
- Answer: a) All inputs are LOW

2797. Which logic gate is formed by inverting the output of an OR gate?

- a) NOR
- b) NAND
- c) XOR
- d) XNOR

Answer: a) NOR

2798. Which gate has the Boolean expression $Y = (A \cdot B)'$?

- a) NOR
- b) NAND
- c) XOR
- d) OR

Answer: b) NAND

2799. To create an AND gate using only NAND gates, the minimum number of NAND gates required is:

- a) 1
- b) 2
- c) 3
- d) 4

Answer: c) 3

2800. The Boolean expression for a NOR gate is:

- a) $A + B$
- b) $(A \cdot B)'$
- c) $(A + B)'$
- d) $A' + B'$

Answer: c) $(A + B)'$

2801. Which gate is formed when the output of a NOR gate is inverted?

- a) NAND
- b) AND
- c) OR
- d) NOT

Answer: c) OR

2802. Why are NAND and NOR gates called universal gates?

- a) They are found in all digital devices
- b) They are easier to design than other gates
- c) Any digital circuit can be built using only NAND or only NOR gates
- d) They consume less power

Answer: c) Any digital circuit can be built using only NAND or only NOR gates

2803. Which feature makes a logic gate “universal”?

- a) It can operate without power

- b) It can replicate all basic logic gates (AND, OR, NOT)
- c) It provides faster switching
- d) It requires only one input

Answer: b) It can replicate all basic logic gates (AND, OR, NOT)

2804. What is the primary reason NAND gates are widely used in digital electronics?

- a) They are slower but cheaper
- b) They produce analog signals
- c) They can be used to build all other logic gates
- d) They require less voltage

Answer: c) They can be used to build all other logic gates

2805. Which of the following is not true about universal gates?

- a) NAND and NOR can form XOR and XNOR gates
- b) NAND gates alone can create all basic gates
- c) NOR gates cannot produce NOT operation
- d) Universal gates can implement any

Boolean function Answer: c) NOR gates cannot produce NOT operation

2806. The universality of NAND and NOR gates means:

- a) They have unlimited inputs
- b) They follow analog principles
- c) They can be used to design any combinational logic circuit
- d) They work at any voltage

Answer: c) They can be used to design any combinational logic circuit

2807. The output of an XNOR gate is HIGH when:

- a) Both inputs are HIGH
- b) Both inputs are LOW
- c) Inputs are unequal
- d) Inputs are equal

Answer: c) Inputs are unequal

2808. The Boolean expression for a 2-input XOR gate is:

- a) AB
- b) $A + B$
- c) $A'B + AB'$
- d) $AB + A'B'$

Answer: c) $A'B + AB'$

2809. What is the output of an XNOR gate when both inputs are HIGH?

- a) HIGH
- b) LOW
- c) Same as input A
- d) Opposite

of XOR Answer:

- a) HIGH

2810. Which gate is called the "inequality detector"?

- a) XOR
- b) AND
- c) XNOR
- d) NOR

Answer: a) XOR

2811. Which gate gives a HIGH output only when both inputs are equal?

- a) XOR
- b) NAND
- c) NOR
- d) XNOR

Answer: d) XNOR

2812. What is the Boolean expression for a 2-input XNOR gate?

- a) $A'B + AB'$
- b) $AB + A'B'$
- c) AB
- d) $(A + B)'$

Answer: b) $AB + A'B'$

2813. What is the output of a 2-input XOR gate when both inputs are 1?

- a) 1
- b) 0
- c) Undefined
- d) Same as input

Answer: b) 0

2814. In which of the following applications is the XOR gate commonly used?

- a) Buffer
- b) Decoder
- c) Parity checker
- d) Flip-flop

Answer: c) Parity checker

2815. What is the output of a 2-input XNOR gate when one input is 1 and the other is 0?

- a) 1
- b) 0
- c) Same as first input
- d) Cannot be determined

Answer: b) 0

2816. The XNOR gate is also known as the:

- a) Equality gate
- b) Odd function gate
- c) Comparator gate
- d) Inequality gate

Answer: a) Equality gate

2817. What logic gate is implemented by IC 7400?

- a) AND
- b) OR
- c) NAND
- d) NOR

Answer: c) NAND

2818. Which of the following ICs contains quad 2-input OR gates?

- a) 7402
- b) 7432
- c) 7408
- d) 7486

Answer: b) 7432

2819. What is the function of IC 7408?

- a) Quad 2-input OR gate
- b) Quad 2-input AND gate
- c) Quad 2-input NAND gate
- d) Dual 4-input AND gate

Answer: b) Quad 2-input AND gate

2820. The IC 7402 is used to implement which logic gate?

- a) NAND
- b) NOR
- c) AND
- d) XOR

Answer: b) NOR

2821. IC 7486 consists of how many XOR gates?

- a) 2
- b) 3
- c) 4
- d) 8

Answer: c) 4

2822. Which IC is used for the XNOR gate in the 74 series family?

- a) 74266
- b) 7486
- c) 7402
- d) 7432

Answer: a) 74266

2823. The 7400 series ICs operate typically on which voltage?

- a) 1.5V
- b) 3.3V
- c) 5V
- d) 9V

Answer: c) 5V

2824. How many gates are inside the IC 7400?

- a) 2
- b) 3
- c) 4
- d) 6

Answer: c) 4(Quad 2-input NAND gates)

2825. In IC 7408, how many pins are generally used for inputs?

- a) 4
- b) 8
- c) 6
- d) 10

Answer: b) 8(Each of the 4 AND gates has 2 inputs)

2826. What is the use of pin 14 in most 7400-series ICs?

- a) Ground
- b) Output
- c) Vcc (Power supply)
- d) Input

Answer: c) Vcc (Power supply)

2827. Which IC provides six NOT gates in one package?

- a) 7400
- b) 7408
- c) 7404
- d) 7432

Answer: c) 7404

2828. How many NOT gates are in IC 7404?

- a) 4
- b) 6
- c) 2
- d) 8

Answer: b) 6

2829. What logic function does IC 7404 perform?

- a) AND
- b) OR
- c) NOR
- d) NOT

Answer: d) NOT

2830. What is the standard supply voltage for 7404 IC?

- a) 3.3V
- b) 6V
- c) 5V
- d) 9V

Answer: c) 5V

2831. What is the typical package type of the 7404 IC?

- a) TO-92
- b) DIP-14
- c) QFN
- d) BGA

Answer: b) DIP-14

2832. Which IC is used to implement XOR gates in the 7400 series?

- a) 7400
- b) 7432
- c) 7486
- d) 7404

Answer: c) 7486

2833. How many XOR gates are present in IC 7486?

- a) 2
- b) 3
- c) 4
- d) 6

Answer: c) 4

2834. What is the Boolean expression implemented by each gate in IC 7486?

- a) $A + B$
- b) AB
- c) $A'B + AB'$
- d) $AB + A'B'$

Answer: c) $A'B + AB'$

2835. What is the typical package type of IC 7486?

- a) TO-220
- b) DIP-14
- c) SIP
- d) BGA

Answer: b) DIP-14

2836. What is the logic output of an XOR gate when both inputs are LOW?

- a) LOW
- b) HIGH
- c) Undefined
- d) High impedance

Answer: a) LOW

2837. A water tank should fill only if the pump is ON and the tank is NOT FULL. Which gate combination is best suited?

- a) OR gate
- b) AND + NOT
- c) NAND

d) NOR

Answer: b) AND + NOT

2838. An automatic door should open if any one of the sensors (A or B) is triggered. Which logic gate should be used?

a) AND

b) XNOR

c) OR

d) XOR

Answer: c) OR

2839. A fire alarm sounds only when both smoke and heat are detected. Which gate should be used?

a) OR

b) XOR

c) AND

d) XNOR

Answer: c) AND

2840. A security light turns ON when it is dark AND movement is detected. What logic gate is used?

a) OR

b) AND

c) XOR

d) XNOR

Answer: b) AND

2841. You have two switches A and B. A light should turn ON only when exactly one switch is ON. Which gate is needed?

a) AND

b) OR

c) XOR

d) NAND

Answer: c) XOR

2842. If $A = 1$ and $B = 0$, what is the output of a NOR gate?

a) 0

b) 1

c) Cannot be determined

d) Same as A

Answer: a) 0

2843. If inputs to a NAND gate are both HIGH, what is the output?

a) LOW

b) HIGH

c) Undefined

d) Depends on previous output

Answer: a) LOW

2844. You want an output that is HIGH only when both A and B are NOT equal. Which

gate should be used?

- a) OR
- b) XNOR
- c) XOR
- d) AND

Answer: c) XOR

2845. Which of the following gate(s) can be used to build a parity checker circuit?

- a) AND
- b) NAND
- c) XOR
- d) NOR

Answer: c) XOR

2846. In a PLC ladder diagram, an AND logic is implemented by:

- a) Parallel contacts
 - b) Series contacts
 - c) Timer blocks
 - d) Relay coils
- Answer: b) Series contacts

2847. Which logic gate is best for turning ON a motor only when two sensors are activated?

- a) OR
- b) AND
- c) NOT
- d) XOR

Answer: b) AND

2848. In PLCs, a normally closed contact behaves like which logic gate?

- a) OR
- b) AND
- c) NOT
- d) XOR

Answer: c) NOT

2849. Which logic gate is most suitable for a parity bit generator in communication systems?

- a) NAND
- b) XOR
- c) AND
- d) NOR

Answer: b) XOR

2850. In a digital security system, the door opens when either code A OR fingerprint B is accepted. What gate is used?

- a) AND
- b) NOT
- c) XOR
- d) OR

Answer: d) OR

2851. In a PLC, how is an AND function implemented in a ladder diagram?

- a) By using two parallel contacts
- b) By using two series contacts
- c) By using a relay coil
- d) By using a timer block

Answer: b) By using two series contacts

2852. Which of the following gates is typically used to implement a decision-making function in a logic control system, where output is HIGH if either of the conditions is true?

- a) AND
- b) OR
- c) NOT
- d) XOR

Answer: b) OR

2853. A NOT gate function in PLC can be implemented using:

- a) Normally open contact
- b) Normally closed contact
- c) Two series contacts
- d) A parallel coil

Answer: b) Normally closed contact

2854. In control system for industrial conveyor system, which logic gate functionality would be used to activate the conveyor when both conditions (sensor A and sensor B) are met?

- a) AND
- b) OR
- c) NAND
- d) XOR

Answer: a) AND

2855. In a ladder logic program, how is an OR function implemented?

- a) Using a series of contacts
- b) Using contacts in parallel
- c) Using a single normally open contact
- d) Using relay outputs

Answer: b) Using contacts in parallel

2856. In a elevator control system, which logic gate(only one)can be used to ensure that the elevator only operates if both the "button pressed" signal and "motor running" signal are true?

- a) AND
- b) OR
- c) NAND
- d) NOT

Answer: a) AND

2857. Which logic gate (one number) is used in a control system for an alarm that triggers when both conditions (sensor A and sensor B) are not met?

- a) NAND
- b) NOR
- c) XOR

d) AND

Answer: a) NAND

2858. In a security system, the alarm should trigger when both the door sensor and motion sensor are triggered. Which gate is used in the to achieve this logic?

a) OR

b) AND

c) XOR

d) NAND

Answer: b) AND

2859. A conveyor belt system should turn ON if either the material is detected OR the start button is pressed. Which logic configuration is required?

a) AND

b) OR

c) NOT

d) XOR

Answer: b) OR

2860. In a control system for a light that should be turned ON only when not only the door is closed, but also the light switch is ON, which gate is used?

a) AND

b) OR

c) NOT

d) XOR

Answer: a) AND

2861. A controlled heating system should turn ON if the room temperature is below a threshold AND the user has selected the heating mode. What logic gate is used?

a) AND

b) OR

c) XOR

d) NOT

Answer: a) AND

2862. A temperature monitoring system should raise an alarm when the temperature exceeds the threshold OR the pressure exceeds the threshold. Which gate would be used to implement this ?

a) AND

b) OR

c) XOR

d) NOT

Answer: b) OR

2863. In a control system, a motor should start only when both the start button is pressed AND the safety guard is closed. Which logic gate would best describe this behavior?

a) NOR

b) XOR

c) AND

d) OR

Answer: c) AND

2864. A security system requires both the correct PIN code and fingerprint match for the door to open. Which gate logic is most appropriate?

a) AND

b) OR

c) XOR

d) NOR

Answer: a) AND

2865. In a temperature control system, a cooling fan should turn ON when the temperature sensor reads above the threshold AND the fan switch is ON. Which logic gate is used?

a) XOR

b) AND

c) OR

d) NOT

Answer: b) AND

2866. A control system is designed to activate an alarm when both smoke is detected or the system is in test mode. What type of logic gate would best accomplish this?

a) AND

b) OR

c) NOT

d) XOR

Answer: b) OR

2867. In a PLC-based elevator system, the elevator should only operate if the floor is requested AND the button is pressed. Which logic gate functionality is used?

a) OR

b) AND

c) NOT

d) XOR

Answer: b) AND

2868. A microcontroller is best described as:

a) A CPU only

b) A complete system with CPU, memory, and I/O ports on a single chip

c) A memory chip

d) An input/output device

Answer: b) A complete system with CPU, memory, and I/O ports on a single chip

2869. Which of the following is true for a microprocessor?

a) It has built-in RAM and ROM

b) It is mainly used for control-based applications

c) It requires external components for memory and I/O

d) It works independently without any peripherals

Answer: c) It requires external components for memory and I/O

2870. Which of these applications typically uses a microcontroller?

- a) Desktop computer
- b) Washing machine
- c) Laptop
- d) Server

Answer: b) Washing machine

2871. Which of the following is NOT a characteristic of microcontrollers?

- a) Embedded in control-oriented applications
- b) Lower power consumption
- c) Requires external I/O modules for basic operation
- d) Used in real-time systems

Answer: c) Requires external I/O modules for basic operation

2872. An 8051 is an example of a:

- a) Microprocessor
- b) Microcontroller
- c) Input
- d) Memory

Answer: b) Microcontroller

2873. The main focus of microcontrollers is:

- a) Number crunching
 - b) Memory management
 - c) Peripheral control and real-time response
 - d) High-speed gaming
- Answer: c) Peripheral control and real-time response

2874. Which component is usually NOT integrated in a basic microprocessor?

- a) ALU
- b) RAM
- c) ROM
- d) I/O Ports

Answer: b) RAM, c) ROM, and d) I/O Ports are usually external in microprocessors.

2875. The main components of a microprocessor are:

- a) Monitor and keyboard
- b) ALU, control unit, registers
- c) RAM and ROM
- d) Hard disk and USB ports

Answer: b) ALU, control unit, registers

2876. Which of the following is a **16-bit** microprocessor?

- a) Intel 4004
- b) Intel 8085
- c) Intel 8086
- d) Intel Pentium

Answer: c) Intel 8086

2877. Which of the following devices typically uses a microcontroller for control of main functionality?

- a) Desktop PC
- b) Washing machine
- c) Server
- d) Laptop

2878. What is the word length of the 8085 microprocessor?

- a) 4-bit
- b) 8-bit
- c) 16-bit
- d) 32-bit

Answer: b)
8-bit

2879. Which register holds the memory address of the next instruction to be executed?

- a) Stack Pointer
- b) Program Counter
- c) Instruction Register
- d) Accumulator

Answer: b) Program Counter

2880. The accumulator in 8085 is used to:

- a) Store addresses
- b) Control program flow
- c) Perform arithmetic/logic operations
- d) Count clock cycles

Answer: c) Perform arithmetic/logic operations

2881. What is the function of the ALE pin in 8085?

- a) Address Latch Enable
- b) Arithmetic Logic Enable
- c) Access Latch Enable
- d) Acknowledge Latch Enable

Answer: a) Address Latch Enable

2882. The 8085 has how many pins?

- a) 20
- b) 30
- c) 40
- d) 50

Answer: c) 40

2883. Which pin is used to reset the microprocessor?

- a) HOLD
- b) RESET IN
- c) S0
- d) READY

Answer: b) RESET IN

2884. Which bus is used to carry data within the 8085?

- a) Address bus

- b) Control bus
 - c) Data bus
 - d) Instruction bus
- Answer: c) Data bus

2885. The 8085 microprocessor can address up to how many memory locations?

- a) 8 KB
- b) 32 KB
- c) 64 KB
- d) 128 KB

Answer: c) 64 KB

2886. The control unit in 8085:

- a) Stores instructions
- b) Executes arithmetic operations
- c) Generates timing and control signals
- d) Increments the program counter

Answer: c) Generates timing and control signals

2887. How many flags are present in 8085's flag register?

- a) 3
- b) 5
- c) 6
- d) 8

Answer: b) 5

2888. Which flag is set when the result of an operation is zero in 8085 microprocessor?

- a) Carry flag
- b) Sign flag
- c) Auxiliary carry
- d) Zero flag

Answer: d) Zero flag

2889. The Carry Flag in 8085 microprocessor is affected by:

- a) Logical operations
- b) MOV instruction
- c) Arithmetic operations like ADD
- d) No operations

Answer: c) Arithmetic operations like ADD

2890. What is a T-state in 8085?

- a) Time taken to execute an instruction
- b) One clock period
- c) One machine cycle
- d) One fetch cycle

Answer: b) One clock period

2891. The instruction cycle of 8085 microprocessor consists of:

- a) Only machine cycles

- b) T-states only
- c) Fetch and execution cycles
- d) None of the above

Answer: c) Fetch and execution cycles

2892. In Von Neumann architecture (microprocessor related), which of the following is shared?

- a) Control Unit and ALU
- b) Data and Instruction Buses
- c) Memory for Data and Instructions
- d) Registers and I/O

Answer: c) Memory for Data and Instructions

2893. Harvard architecture (microcontroller related) allows:

- a) Only one operation at a time
- b) Parallel instruction and data access
- c) Mixing of instructions and data
- d) Only one bus

Answer: b) Parallel instruction and data access

2894. Which type of architecture is used in Intel 8085?

- a) Harvard
- b) Modified Harvard
- c) Von Neumann
- d) None of the above

Answer: c) Von Neumann

2895. What is a key disadvantage of Von Neumann architecture?

- a) Expensive memory
- b) Complex programming
- c) Von Neumann bottleneck
- d) Lack of timers

Answer: c) Von Neumann bottleneck

2896. Which architecture is best suited for signal processing and embedded control?

- a) Harvard
- b) Von Neumann
- c) Turing
- d) ARM 7

Answer: a) Harvard

2897. Which of the following is a data transfer instruction in the 8085 microprocessor?

- a) ADD
- b) MOV
- c) JMP
- d) MVI

Answer: d) MVI

2898. Which instruction in 8085 is used to add two numbers stored in registers?

- a) ADD
- b) SUB

c) ADC

d) DAA

Answer: a) ADD

2899. Which of the following is an example of an arithmetic instruction?

a) MOV

b) CMP

c) ADD

d) JMP

Answer: c) ADD

2900. The instruction JC in 8085 is an example of a:

a) Data transfer instruction

b) Arithmetic instruction

c) Branching instruction

d) Machine control instruction

Answer: c) Branching instruction

2901. Which of the following is a logical instruction in the 8085 microprocessor?

a) ADD

b) CMP

c) ORA

d) JMP

Answer: c) ORA

2902. In indirect addressing mode, the operand is:

a) Directly provided in the instruction

b) Stored in a register

c) Stored at the memory address specified by a register pair

d) Stored in the accumulator

Answer: c) Stored at the memory address specified by a register pair

2903. What does the MOV instruction do in 8085 assembly language?

a) Adds two numbers

b) Transfers data between registers or memory and register

c) Jumps to another location

d) Subtracts two numbers

Answer: b) Transfers data between registers or memory and register

2904. In immediate addressing mode, the operand is:

a) Stored in memory

b) A constant value directly in the instruction

c) In the accumulator

d) In a register pair

Answer: b) A constant value directly in the instruction

2905. Which of the following addressing modes is used in MOV A, M instruction?

a) Direct addressing

b) Register addressing

c) Register indirect addressing

d) Immediate addressing

Answer: c) Register indirect addressing

2906. The JMP instruction in 8085 is an example of:

a) Data transfer instruction

b) Arithmetic instruction

c) Branching instruction

d) Machine control

instruction Answer: c)

Branching instruction

2907. The instruction SUB in 8085 performs:

a) Addition of two numbers

b) Subtraction of the accumulator with memory contents

c) Logical AND operation

d) Data transfer between registers

Answer: b) Subtraction of the accumulator with memory contents

2908. In the MVI instruction, the I stands for:

a) Input

b) Immediate

c) Indirect

d) Instruction

Answer: b) Immediate

2909. Which of the following instructions is used to jump to a memory location?

a) JMP

b) MOV

c) RLC

d) ADD

Answer: a) JMP

2910. The instruction RLC in 8085 is used for:

a) Left shift of the accumulator

b) Right shift of the accumulator

c) Rotate the contents of the accumulator left

d) Rotate the contents of the accumulator right

Answer: c) Rotate the contents of the accumulator left

2911. What is the primary use of loops in 8085 assembly language programming?

a) To execute instructions sequentially

b) To perform arithmetic operations

c) To repeat a block of instructions

d) To perform branching

Answer: c) To repeat a block of instructions

2912. Which of the following instructions is used to initialize a register with an immediate value?

a) MVI

b) MOV

c) ADD

d) JMP

Answer: a) MVI

2913. Which addressing mode is used in ADD B instruction?

a) Direct

b) Immediate

c) Register

d) Indirect

Answer: c) Register

2914. Which of the following memory types is non-volatile?

a) RAM

b) ROM

c) EPROM

d) Both b and c

Answer: d) Both b and c

2915. In which type of memory is data erased by ultraviolet light and then can be reprogrammed?

a) RAM

b) ROM

c) EPROM

d) EEPROM

Answer: c) EPROM

2916. Which of the following memory types is volatile?

a) ROM

b) RAM

c) EPROM

d) Both b and c

Answer: b) RAM

2917. Which type of memory is commonly used to store the firmware (permanent programs)?

a) RAM

b) ROM

c) EPROM

d) DRAM

Answer: b) ROM

2918. Which of the following memory types is readable and writable?

a) ROM

b) EPROM

c) RAM

d) Flash memory

Answer: c) RAM

2919. When interfacing RAM with the microprocessor, which of the following is typically used to select the memory?

a) Address bus

- b) Data bus
- c) Control bus
- d) All of the above

Answer: a) Address bus

2920. Which of the following is used to enable the memory chip during memory interfacing?

- a) Chip Select
- b) Address Line
- c) Data Line
- d) Read/Write signal

Answer: a) Chip Select

2921. The memory chip selection in interfacing is generally done using:

- a) Address decoding
- b) Control signals
- c) Direct addressing
- d) Both a and b

Answer: d) Both a and b

2922. In I/O mapped I/O, the I/O devices are accessed using:

- a) Memory addresses
- b) Specific I/O instructions like IN and OUT
- c) Address bus
- d) Both b and c

Answer: b) Specific I/O instructions like IN and OUT

2923. In memory-mapped I/O, the I/O devices are treated as:

- a) Separate from memory
 - b) Part of the memory address space
 - c) Only accessed by IN/OUT instructions
 - d) Not accessible by the processor
- Answer: b) Part of the memory address space

2924. Which of the following is an advantage of memory-mapped I/O over I/O-mapped I/O?

- a) Uses separate I/O instructions
- b) Fewer address lines required
- c) Same instructions can be used for both I/O and memory
- d) Faster data transfer

Answer: c) Same instructions can be used for both I/O and memory

2925. In I/O mapped I/O, the I/O devices are assigned addresses in the range:

- a) 0000H to FFFFH
 - b) 0000H to 3FFFH
 - c) 0000H to 7FFFH
 - d) 0000H to FFFFFH
- Answer: b) 0000H to 3FFFH

2926. Which of the following is used in memory-mapped I/O to identify whether the read/write operation is on memory or I/O?

- a) I/O instructions

- b) Address decoding
- c) Control signals
- d) Both b and c

Answer: d) Both b and c

2927. Address decoding is used to:

- a) Assign a unique address to each memory location
- b) Determine which device (memory or I/O) the microprocessor is accessing
- c) Direct data flow through the data bus
- d) Set the direction of data transfer

Answer: b) Determine which device (memory or I/O) the microprocessor is accessing

2928. In address decoding, when the address is decoded, it activates:

- a) A chip select signal
- b) An interrupt signal
- c) A read/write signal
- d) A clock signal

Answer: a) A chip select signal

2929. Which of the following techniques is used in address decoding for activating a specific memory or I/O device?

- a) Boolean expressions
- b) Address comparison
- c) Address range allocation
- d) All of the above

Answer: d) All of the above

2930. A common method of address decoding in microprocessor systems is to use:

- a) A comparator circuit
- b) A combination of logic gates
- c) A microcontroller
- d) A counter circuit

Answer: b) A combination of logic gates

2931. Which of the following interrupts is hardware-generated in the 8085 microprocessor?

- a) RST7.5
- b) TRAP
- c) INTR
- d) All of the above

Answer: d) All of the above

2932. Which of the following interrupts is software-generated in the 8085 microprocessor?

- a) TRAP
- b) INTR
- c) RST7.5
- d) None of the above

Answer: d) None of the above

2933. The TRAP interrupt in the 8085 microprocessor is:

- a) Maskable and low-priority

- b) Non-maskable and high-priority
- c) Maskable and high-priority
- d) Non-maskable and low-priority

Answer: b) Non-maskable and high-priority

2934. The INTR (Interrupt Request) signal is a:

- a) Maskable interrupt
- b) Non-maskable interrupt
- c) Fixed priority interrupt
- d) Software interrupt

Answer: a) Maskable interrupt

2935. The 8085 microprocessor has how many interrupt lines?

- a) 3
- b) 5
- c) 6
- d) 8

Answer: b) 5

2936. Which of the following interrupts has the highest priority in the 8085 microprocessor?

- a) INTR
- b) TRAP
- c) RST7.5
- d) RST6.5

Answer: b) TRAP

2937. What is the function of the RST (Restart) instructions in 8085?

- a) They act as software interrupts
- b) They initiate a jump to a specific memory address
- c) They are used for hardware communication
- d) Both a and b

Answer: d) Both a and b

2938. Interrupt Vector Table

Q8. The interrupt vector table stores:

- a) Interrupt service routine addresses
- b) Interrupt status
- c) Masking instructions
- d) Interrupt acknowledgment signals

Answer: a) Interrupt service routine addresses

2939. The interrupt vector table for RST7.5, RST6.5, and RST5.5 in the 8085 starts from memory address:

- a) 0024H
- b) 0040H
- c) 002C
- d) 003C

Answer: a) 0024H

2940. In the 8085, the TRAP interrupt has an associated vector address of:

- a) 0034H
- b) 0024H
- c) 0044H
- d) 0064H

Answer: a) 0034H

2941. In the timing diagram of the 8085, which signal is used to indicate that the microprocessor is reading data from memory?

- a) RD
- b) WR
- c) M/IO
- d) ALE

Answer: a) RD

2942. Which of the following signals is used to synchronize the data transfer between the microprocessor and memory in the 8085?

- a) ALE
- b) RD
- c) WR
- d) CLK

Answer: a) ALE

2943. In the timing diagram of 8085, the ALE signal indicates:

- a) The presence of data on the data bus
- b) The address is available on the address bus
- c) A read operation
- d) A write operation

Answer: b) The address is available on the address bus

2944. The M/IO signal in the 8085 indicates:

- a) Whether the operation is a memory or I/O operation
- b) Whether the data is being read or written
- c) The timing for the memory read
- d) The direction of data transfer

Answer: a) Whether the operation is a memory or I/O operation

2945. In the timing diagram for 8085, the WR signal is used to:

- a) Indicate a memory write operation
- b) Indicate a memory read operation
- c) Indicate an I/O read operation
- d) Indicate an I/O write operation

Answer: a) Indicate a memory write operation

2946. The 8255 is used for interfacing:

- a) Memory
- b) Keyboard
- c) I/O devices
- d) Display

Answer: c) I/O devices

2947. The 8255 has how many I/O ports?

- a) 2
- b) 4
- c) 8
- d) 16

Answer: b) 4

2948. In 8255, each I/O port can be configured as:

- a) Input or Output
- b) Only Output
- c) Only Input
- d) Both A and B

Answer: a) Input or Output

2949. The 8255 microprocessor peripheral interface is used to provide communication between:

- a) Microprocessor and keyboard
- b) Microprocessor and display
- c) Microprocessor and external I/O devices
- d) Microprocessor and memory

Answer: c) Microprocessor and external I/O devices

2950. In 8255, the Control Word is used to:

- a) Enable data transfer
- b) Select mode of operation for each port
- c) Select the interrupt source
- d) All of the above

Answer: b) Select mode of operation for each port

2951. The 8253 is a programmable timer used for:

- a) Interrupt generation
- b) Clock generation
- c) Frequency division
- d) All of the above

Answer: d) All of the above

2952. The 8253 timer has how many counters?

- a) 1
- b) 2
- c) 3
- d) 4

Answer: c) 3

2953. In the 8253, the mode of operation is selected by:

- a) Control word
- b) Data bus
- c) Interrupt vector
- d) Clock signal

Answer: a) Control word

2954. Which of the following is NOT a mode of operation in the 8253?

- a) Mode 0 - Interrupt on terminal count
- b) Mode 1 - Programmable square wave generator
- c) Mode 2 - Rate generator
- d) Mode 3 - Pulse width modulation

Answer: d) Mode 3 - Pulse width modulation (This is an invalid mode for the 8253)

2955. The 8279 is used for interfacing:

- a) Keyboard and display
 - b) Printer
 - c) I/O devices
 - d) Memory
- Answer: a) Keyboard and display

INSTRUMENTATION

2956. Instrumentation is primarily concerned with:

- A) Power generation
- B) Measurement and control of variables
- C) Electrical wiring
- D) Mechanical design

Answer: B

2957. Which of the following is a static characteristic of a measuring instrument?

- A) Time constant
- B) Sensitivity
- C) Response time
- D) Rise time

Answer: B

2958. The accuracy of an instrument is defined as:

- A) Ability to detect small changes
- B) Closeness to the true value
- C) Time to reach final value
- D) Degree of oscillation

Answer: B

2959. Which one is a dynamic characteristic with respect to instrumentation?

- A) Resolution
- B) Repeatability
- C) Dead time
- D) Linearity

Answer: C

2960. The repeatability of an instrument refers to:

- A) Variation with time
- B) Ability to produce same output under identical conditions
- C) Stability in long term

D) None of the above

Answer: B

2961. The response of a thermometer to a sudden change in temperature is an example of:

A) Static characteristic

B) Dynamic characteristic

C) Error

D) Drift Answer:

B

2962. If an instrument has poor resolution, it:

A) Responds slowly

B) Cannot detect small changes in input

C) Gives high errors

D) Is unstable

Answer: B

2963. The difference between the measured value and the true value is:

A) Resolution

B) Drift

C) Error

D) Sensitivity

Answer: C

2964. An instrument that consistently gives higher readings than actual has a:

A) Drift error

B) Systematic error

C) Random error

D) Dynamic error

Answer: B

2965. The ability of an instrument to remain unaffected by small disturbances is:

A) Stability

B) Sensitivity

C) Accuracy

D) Linearity

Answer: A

2966. The sensitivity of an instrument is defined as:

A) Minimum input that causes detectable change

B) Ratio of output signal to input change

C) Maximum deviation in output

D) Total error

Answer: B

2967. A calibration of an instrument is needed to:

A) Increase sensitivity

B) Adjust drift

C) Ensure accuracy

D) Control time constant

Answer: C

2968. Which of the following is NOT a source of error in instrumentation?

- A) Environmental changes
- B) Aging of components
- C) Proper calibration
- D) Manufacturing tolerances

Answer: C

2969. A zero error refers to:

- A) No error in measurement
- B) Error when input is zero
- C) Random fluctuation
- D) Error in maximum range

Answer: B

2970. Instruments used only to indicate a value and not control are called:

- A) Control instruments
- B) Indicating instruments
- C) Feedback devices
- D) Digital instruments

Answer: B

2971. The dead zone of an instrument is the range where:

- A) Output is maximum
- B) No output change occurs with input
- C) It is linear
- D) Instrument resets

Answer: B

2972. Which of the following improves accuracy?

- A) Poor calibration
- B) High hysteresis
- C) Shielding and grounding
- D) Frequent drift

Answer: C

2973. Linearity in instrumentation means:

- A) Straight scale
- B) Input-output relation is a straight line
- C) Logarithmic behavior
- D) Random output

Answer: B

2974. Dynamic response is influenced by:

- A) Hysteresis
- B) Time constant
- C) Zero error
- D) Sensitivity

Answer: B

2975. A good instrumentation system should have:

- A) High drift and noise
- B) Low sensitivity
- C) High accuracy, good dynamic response, and reliability
- D) Poor linearity

Answer: C

2976. The main purpose of a temperature controller in the control system is to:

- A) Display measured values
- B) Maintain process variable at set point
- C) Convert signals
- D) Increase error

Answer: B

2977. In a proportional controller, the output is:

- A) Proportional to the rate of error
- B) Constant for all errors
- C) Proportional to the magnitude of error
- D) Inversely proportional to error

Answer: C

2978. Integral control action helps eliminate:

- A) Oscillation
- B) Offset (steady-state error)
- C) Delay
- D) Proportional gain

Answer: B

2979. Derivative control is mainly used to:

- A) Remove error completely
- B) Predict future error
- C) Increase steady-state error
- D) Eliminate drift

Answer: B

2980. A PID controller combines:

- A) Position, indication, and direction control
- B) Proportional, Integral, and Derivative control
- C) Pressure, input, and discharge
- D) Power, inertia, and delay

Answer: B

2981. A major drawback of pure P control is:

- A) Slow response
- B) Offset error
- C) Instability
- D) High overshoot

Answer: B

2982. The Ziegler-Nichols method is used for:

- A) Sensor calibration
- B) Tuning controllers
- C) Converting signals
- D) Amplifying current

Answer: B

2983. In on-off control, the output is:

- A) Analog
- B) Discrete (either full on or full off)
- C) Proportional to error
- D) Smoothly increasing

Answer: B

2984. Which of the following is the fastest-acting controller?

- A) Proportional
- B) Integral
- C) Derivative
- D) On-off

Answer: D

2985. In a control system, offset is a steady-state error found in:

- A) P controller only
- B) I controller only
- C) PI controller
- D) All types

Answer: A

2986. A pneumatic controller operates using:

- A) Hydraulic oil
- B) Electric current
- C) Compressed air
- D) Steam

Answer: C

2987. The main disadvantage of derivative control is:

- A) Offset error
- B) Drift
- C) Sensitivity to noise
- D) Slow response

Answer: C

2988. A PI controller improves:

- A) Noise filtering
- B) Speed of response
- C) Offset elimination
- D) Anticipation of error

Answer: C

2989. A PD controller is best suited for:

- A) Removing offset
- B) Systems with high delay
- C) Fast disturbance rejection
- D) Reducing setpoint

Answer: C

2990. Tuning of a controller involves adjusting:

- A) Process variables
- B) Output valves
- C) Gain constants
- D) Feedback sensors

Answer: C

2991. The main advantage of a PID controller is:

- A) Simplicity
- B) Manual operation
- C) High precision and fast correction
- D) Low cost

Answer: C

2992. For a slow process with large dead time, the preferred controller is:

- A) Derivative only
- B) On-off
- C) PI
- D) PID

Answer: D

2993. The control action in electronic controllers is usually achieved by:

- A) Relays
- B) Operational amplifiers
- C) Manual switches
- D) Pressure gauges

Answer: B

2994. Reset action is another name for:

- A) Proportional
- B) Integral
- C) Derivative
- D) On-off

Answer: B

2995. Which controller provides the most stable control for all process types?

- A) P only
- B) I only
- C) PID
- D) On-off

Answer: C

2996. A recorder in instrumentation is primarily used to:

- A) Control process variables
- B) Measure pressure
- C) Record the value of a parameter over time
- D) Calibrate instruments

Answer: C

2997. Strip chart recorders record data on:

- A) Circular charts
- B) Moving paper strips
- C) Digital screens
- D) Magnetic tapes

Answer: B

2998. In a circular chart recorder, the paper rotates:

- A) Linearly
- B) Intermittently
- C) Continuously in circular motion
- D) Randomly

Answer: C

2999. An XY recorder plots:

- A) Time vs. voltage
- B) X-input vs. Y-input
- C) Temperature vs. time
- D) Pressure vs. current

Answer: B

3000. A major advantage of digital recorders over analog ones is:

- A) Slow recording
- B) Low accuracy
- C) High precision and storage capability
- D) Fragile design

Answer: C

3001. Which of the following recorders is best suited for laboratory use in two-variable plotting?

- A) Circular chart recorder
- B) Strip chart recorder
- C) XY recorder
- D) Data logger

Answer: C

3002. Data loggers store data in:

- A) Paper rolls
- B) Ink cartridges
- C) Electronic memory
- D) Mechanical relays

Answer: C

3003. A servo motor in a recorder is used for:

- A) Producing heat
- B) Moving the pen/stylus
- C) Operating the sensor
- D) Displaying the value

Answer: B

3004. Pen drive or memory card storage is commonly used in:

- A) Strip chart recorders
- B) XY recorders
- C) Digital recorders
- D) Pneumatic recorders

Answer: C

3005. The time base in a recorder determines:

- A) Voltage sensitivity
- B) Paper speed or plotting interval
- C) Current range
- D) Chart color

Answer: B

3006. In a potentiometric recorder, the input signal is compared with:

- A) A thermocouple
- B) A reference voltage
- C) A microcontroller
- D) A capacitor

Answer: B

3007. The measuring pen in analog recorders moves based on:

- A) Air pressure
- B) Magnetic field
- C) Electrical signal
- D) Manual control

Answer: C

3008. One disadvantage of strip chart recorders is:

- A) Cannot record temperature
- B) Slow data retrieval
- C) Small display
- D) Not used in industry

Answer: B

3009. Recorders that use computer interfaces (USB/RS232) are classified as:

- A) Mechanical recorders
- B) Paper chart recorders
- C) Digital data loggers
- D) XY plotters

Answer: C

3010. Hybrid recorders combine:

- A) Analog and digital features
- B) Flow and temperature displays
- C) Manual and automatic tuning
- D) Ink and thermal paper

Answer: A

3011. The chart rotation speed in a circular recorder is usually:

- A) 1 second
- B) 1 hour
- C) 24 hours or 7 days
- D) 1 month

Answer: C

3012. A recorder with multiple channels is used to:

- A) Record a single signal
- B) Plot only digital data
- C) Record multiple parameters simultaneously
- D) Plot only temperature

Answer: C

3013. Thermal printers in modern recorders are preferred due to:

- A) Ink-based operation
- B) Silent and fast printing
- C) Bulky construction
- D) High power usage

Answer: B

3014. Recorders are mostly used in control systems for:

- A) Display only
- B) Feedback signal generation
- C) Logging and analysis
- D) Tuning controllers

Answer: C

3015. The difference between recorders and indicators is:

- A) Recorders display real-time data only
- B) Indicators store data
- C) Indicators display, recorders store data
- D) Both do the same function

Answer: C

3016. A voltage-to-current converter (V-I converter) converts:

- A) Current to power
- B) Voltage signal into proportional current
- C) Voltage to frequency
- D) AC to DC

Answer: B

3017. The most common application of a V-I converter is in:

- A) Battery charging
- B) Audio amplification
- C) Transducer excitation and 4–20 mA current loops
- D) UPS systems

Answer: C

3018. In a current loop system, a 4–20 mA signal typically represents:

- A) Frequency
- B) Voltage input
- C) Measured process variable
- D) Error signal

Answer: C

3019. A V-I converter is often implemented using:

- A) Relay
- B) Transformer
- C) Operational amplifier (Op-Amp)
- D) Motor

Answer: C

3020. The output current in a V-I converter is:

- A) Inversely proportional to input voltage
- B) Not related to input
- C) Directly proportional to input voltage
- D) Constant always

Answer: C

3021. In a simple Op-Amp V-I converter, the load is usually connected at:

- A) Inverting input
- B) Output terminal
- C) Ground terminal
- D) Power supply

Answer: B

3022. Which of the following is an advantage of current signal transmission?

- A) Affected by noise
- B) Voltage drop in wires
- C) Immune to long-distance interference
- D) Poor accuracy

Answer: C

3023. The input impedance of an ideal V-I converter is:

- A) Infinite
- B) Very high
- C) Very low (ideally 0)
- D) Equal to load resistance

Answer: C

3024. In industry, the 4 mA base level in a 4–20 mA system represents:

- A) No signal (off)
- B) System fault
- C) Minimum measurable value
- D) Power supply value

Answer: C

3025. The 20 mA level in a standard V-I current loop indicates:

- A) System failure
- B) Maximum value of measurement range
- C) Zero offset
- D) Minimum setpoint

Answer: B

3026. In a current loop, current remains constant:

- A) Only in analog systems
- B) Regardless of loop resistance (within limits)
- C) Only at low temperatures
- D) During calibration only

Answer: B

3027. A sourcing type V-I converter:

- A) Accepts current from the load
- B) Provides current to the load
- C) Works only with voltage input
- D) Acts like a resistor

Answer: B

3028. The linear range of a V-I converter refers to:

- A) Constant current operation
- B) Input voltage range that produces linear current
- C) Non-usable voltage range
- D) Frequency range

Answer: B

3029. Which of these is true about Op-Amp based V-I converters?

- A) Output depends on temperature
- B) Output current can flow through grounded load
- C) Requires digital signal input
- D) Works without feedback

Answer: B

3030. The transfer function of an ideal V-I converter is:

- A) $V_{out} = V_{in}$
- B) $I_{out} = V_{in} / R$
- C) $I_{out} = R \times V_{in}$
- D) $I_{out} = \sqrt{V_{in}}$

Answer: B

3031. A current transmitter in process control typically includes:

- A) Thermistor
- B) V-I converter
- C) Relay
- D) Battery

Answer: B

3032. The advantage of using 4 mA instead of 0 mA as the base level is:

- A) To save energy
- B) For increased voltage
- C) To detect wire break/fault
- D) To reduce noise

Answer: C

3033. A typical V-I converter circuit requires:

- A) Only a capacitor
- B) Op-Amp, resistor, and power supply
- C) Thermocouple
- D) Triac and diode

Answer: B

3034. In a 4–20 mA current loop, if the loop is open (broken wire), the current will be:

- A) 4 mA
- B) 20 mA
- C) 0 mA
- D) Undefined

Answer: C

3035. Which parameter primarily decides the output current in a V-I converter?

- A) Feedback voltage
- B) Input voltage and resistor value
- C) Supply frequency
- D) Load inductance

Answer: B

3036. An Electro-Pneumatic (EP) actuator converts:

- A) Electric signal to temperature
- B) Pneumatic signal to electrical output
- C) Electrical signal into pneumatic motion
- D) Hydraulic pressure into torque

Answer: C

3037. EP actuators are widely used in:

- A) Automobile engines
- B) Pneumatic brakes
- C) Industrial control valves
- D) Thermostats

Answer: C

3038. The electrical signal in an EP actuator usually controls:

- A) Valve opening only
- B) Air flow directly
- C) Solenoid or I/P converter
- D) Motor direction

Answer: C

3039. In an EP actuator system, “I/P” stands for:

- A) Input/Pressure
- B) Insulation/Power
- C) Current-to-Pressure
- D) Inverse Potential

Answer: C

3040. The most common signal used for EP actuators in industry is:

- A) 0–5 V
- B) 4–20 mA
- C) 110 V AC
- D) 0–100 psi

Answer: B

3041. The pneumatic section of the EP actuator typically involves:

- A) Electric field control
- B) Movement of compressed air
- C) Heating element
- D) Laser guidance

Answer: B

3042. An EP actuator is preferred over a manual actuator for:

- A) Simplicity
- B) Remote and automatic control
- C) Lower cost
- D) Compact size

Answer: B

3043. The main advantage of EP actuators is:

- A) No power needed
- B) Accurate and remote positioning
- C) Use of refrigerant
- D) High noise operation

Answer: B

3044. The response time of EP actuators compared to hydraulic actuators is generally:

- A) Slower
- B) Same
- C) Faster
- D) Not comparable

Answer: A

3045. Position feedback in EP actuators is obtained using:

- A) Bimetallic strips
- B) Potentiometer or position sensor
- C) Bulb and capillary
- D) Relay contacts

Answer: B

3046. A smart EP actuator includes:

- A) Only pneumatic control
- B) Manual override
- C) Microcontroller with diagnostics
- D) No feedback loop

Answer: C

3047. EP actuators are commonly used with which kind of control valves?

- A) Ball valves
- B) Globe valves
- C) Safety relief valves
- D) Check valves

Answer: B

3048. In a fail-safe EP actuator, upon power failure, the valve will:

- A) Stay in last position
- B) Open fully
- C) Close fully
- D) Move to a predefined safe position

Answer: D

3049. The main energy source required by the pneumatic side of an EP actuator is:

- A) Steam
- B) Compressed air
- C) Battery
- D) Solar energy

Answer: B

3050. EP actuators are NOT typically used where:

- A) Explosion-proof operation is required
- B) Remote control is needed
- C) Continuous high torque is needed
- D) Precise flow control is

required Answer: C

3051. A typical I/P converter uses a:

- A) Thermistor
- B) Piezoelectric crystal
- C) Electromagnetic coil and nozzle-flapper mechanism
- D) Hydraulic cylinder

Answer: C

3052. Deadband in an EP actuator system refers to:

- A) Time when the actuator is powered off
- B) Range where input change produces no output change
- C) Peak overshoot
- D) Output oscillation

Answer: B

3053. Which material is commonly used for diaphragms in EP actuators?

- A) Glass
- B) Rubber or synthetic elastomer
- C) Steel
- D) PVC

Answer: B

3054. A double-acting actuator requires:

- A) Only spring return
- B) Air pressure on both sides of piston
- C) No air at all
- D) Electronic displacement sensor

Answer: B

3055. The pneumatic pressure range for EP actuators is typically:

- A) 0–5 psi
- B) 3–15 psi
- C) 20–100 psi
- D) 50–150 psi

Answer: B

3056. A **transmitter** in instrumentation is primarily used to:

- A) Display values
- B) Send processed signals to control systems
- C) Increase voltage
- D) Store data

Answer: B

3057. A **flow transmitter** measures:

- A) Voltage
- B) Distance
- C) Rate of fluid movement
- D) Light intensity

Answer: C

3058. A **pressure transmitter** converts pressure into:

- A) Current or voltage signal
- B) Flow signal
- C) Resistance value
- D) Mechanical vibration

Answer: A

3059. The most commonly used signal standard for transmitters in industry is:

- A) 0–10 V
- B) 4–20 mA
- C) 5–15 V
- D) 220 V AC

Answer: B

3060. A **differential pressure transmitter** is used in:

- A) Motor control
- B) Flow measurement using orifice plates
- C) Voltage regulation
- D) Pressure relief valves

Answer: B

3061. A **smart transmitter** includes:

- A) Only analog output
- B) Digital communication and self-diagnostics
- C) Relay output only
- D) Manual tuning knobs

Answer: B

3062. The **zero drift** in a transmitter refers to:

- A) Total signal loss
- B) Sudden pressure spike
- C) Shift in zero reading over time
- D) Electrical short

Answer: C

3063. **Span** of a pressure transmitter refers to:

- A) Operating voltage range
- B) Time delay
- C) Difference between maximum and minimum measured values
- D) Air volume

Answer: C

3064. Which of the following is a **primary element** used with flow transmitters?

- A) Thermocouple
- B) Orifice plate
- C) Op-amp
- D) Diode

Answer: B

3065. **Calibration** of a transmitter involves:

- A) Installing software
- B) Adjusting input-output relation to standard
- C) Removing the transmitter
- D) Using a multimeter only

Answer: B

3066. A **gauge pressure transmitter** measures pressure relative to:

- A) Zero
- B) Atmospheric pressure
- C) Vacuum
- D) Sea level

Answer: B

3067. **Absolute pressure** is measured with respect to:

- A) Atmospheric pressure
- B) Vacuum (zero reference)
- C) Water pressure
- D) Line pressure

Answer: B

3068. A **flow nozzle** is a device used to:

- A) Increase current
- B) Introduce signal noise
- C) Create differential pressure for flow measurement
- D) Purify fluids

Answer: C

3069. In a **4–20 mA loop**, 4 mA typically represents:

- A) Overflow condition
- B) No pressure
- C) Minimum measurable value
- D) Full scale

Answer: C

3070. A transmitter used in **hazardous areas** should be:

- A) Non-metallic
- B) Non-intrinsically safe
- C) Intrinsically safe or explosion-proof
- D) Water cooled

Answer: C

3071. A **piezoresistive sensor** in pressure transmitters changes resistance with:

- A) Light
- B) Mechanical stress (pressure)
- C) Voltage
- D) Time

Answer: B

3072. The **output** of most modern transmitters is:

- A) Only visual
- B) Analog and/or digital
- C) Hydraulic pressure
- D) Manual reading

Answer: B

3073. The **linear output** of a transmitter ensures:

- A) Constant pressure
- B) Easy calibration and predictable response
- C) Resistance to corrosion
- D) Self-healing circuit

Answer: B

3074. A **multivariable transmitter** can measure:

- A) Only temperature
- B) Only flow
- C) Flow, pressure, and temperature
- D) Light and sound

Answer: C

3075. **HART protocol** is used in smart transmitters for:

- A) Analog-to-digital conversion
- B) Wireless transmission
- C) Digital communication over analog signal lines
- D) Power regulation

Answer: C

3076. A transducer is a device that:

- A) Stores energy
- B) Converts one form of energy into another
- C) Generates high voltage
- D) Filters signals

Answer: B

3077. A thermocouple generates voltage based on:

- A) Pressure difference
- B) Light intensity
- C) Temperature difference between junctions
- D) Resistance change

Answer: C

3078. The phenomenon used in thermocouples is known as:

- A) Joule effect
- B) Piezoelectric effect
- C) Seebeck effect
- D) Faraday's law

Answer: C

3079. In a thermocouple, the two junctions are:

- A) Electrically connected
- B) Magnetically coupled
- C) Hot and cold (reference) junctions
- D) Oppositely polarized

Answer: C

3080. A Resistance Temperature Detector (RTD) works based on:

- A) Thermal expansion
- B) Change in resistance with temperature
- C) Generation of current
- D) Pressure variation

Answer: B

3081. The most commonly used metal in RTDs is:

- A) Copper
- B) Nickel
- C) Platinum
- D) Aluminum

Answer: C

3082. The resistance of a platinum RTD at 0°C is typically:

- A) 100 Ω
- B) 50 Ω
- C) 10 Ω
- D) 200 Ω

Answer: A

3083. RTDs are preferred over thermocouples for:

- A) Low cost
- B) High-temperature ranges
- C) Higher accuracy and stability
- D) Faster response time

Answer: C

3084. A thermistor has a temperature-dependent:

- A) Voltage
- B) Capacitance
- C) Resistance
- D) Frequency

Answer: C

3085. Thermistors are typically made of:

- A) Metallic alloys
- B) Platinum
- C) Semiconductor materials
- D) Glass

Answer: C

3086. A NTC thermistor exhibits:

- A) Resistance increases with temperature
- B) Resistance decreases with temperature
- C) Constant resistance
- D) No change in resistance

Answer: B

3087. A PTC thermistor is used where:

- A) Temperature stability is unwanted
- B) Sudden current drop is needed
- C) Overcurrent protection is required
- D) Battery charging is disabled

Answer: C

3088. The temperature range for a standard thermocouple (e.g., Type K) is:

- A) -10 to 100°C
- B) -200 to 1250°C
- C) 0 to 400°C
- D) 100 to 500°C

Answer: B

3089. RTDs have a linear response over:

- A) Narrow range
- B) Wide temperature range
- C) No range
- D) High-pressure range

Answer: B

3090. Which device offers the fastest response time to temperature change?

- A) RTD
- B) Thermistor
- C) Thermocouple
- D) Mercury thermometer

Answer: C

3091. A cold junction compensation is required in:

- A) RTDs
- B) Thermistors
- C) Thermocouples
- D) All temperature sensors

Answer: C

3092. Which sensor type is best suited for precise laboratory measurements?

- A) Thermistor
- B) RTD
- C) Thermocouple
- D) Bimetallic strip

Answer: B

3093. RTDs are more expensive than thermocouples due to:

- A) High resistance
- B) Use of platinum and precision manufacturing
- C) Smaller size
- D) Longer wires

Answer: B

3094. A thermistor is non-linear, meaning:

- A) Output is proportional to time
- B) Resistance changes randomly
- C) Resistance vs. temperature curve is not straight
- D) It can't be used with a display

Answer: C

3095. Instrumentation engineers usually deal with:

- A) Digital marketing
- B) Physical parameter measurement (temperature, flow, pressure)
- C) Network design
- D) Welding schedules

Answer: B

3096. Which controller is best suited for systems with no steady-state error and fast response?

- a) On-Off Controller
- b) Proportional Controller (P)
- c) Integral Controller (I)
- d) Derivative Controller (D)

Answer: B

3097. The PI controller eliminates

- a)Overshoot
- b)Stability
- c)Steady-state error
- d)Time delay

Answer: C

3098. Which of the following controllers provides anticipatory action?

- a)P
- b)PI
- c)I
- d)D

e)Answer: D

3099. A PID controller is mainly used for

- a)Reducing hardware complexity
- b)High-speed applications only
- c)Cost reduction

d)Accurate and stable control of dynamic systems

Answer: D

3100. In field instrumentation, controllers are typically installed in

- a)Software only
- b)Operator panels
- c)Field transmitters or control panels
- d)Actuators

Answer: C

3101. In process industries, the most common control loop implemented is

- a)On-Off
- b)P
- c)PID
- d)Manual

Answer: C

3102. The main advantage of PLC-based controller implementation is

- a)Low voltage operation
- b)Compact design
- c)Flexibility and re-programmability
- d)None of the above

Answer: C

3103. In PLC programming, PID control is typically implemented using

- a)Binary Input Blocks
- b)Boolean Operators
- c)PID Function Block
- d)Timers only

Answer: C

3104. Which controller type reacts only to the current error?

- a)PI
- b)P
- c)I
- d)PID

Answer: B

3105. Which controller type eliminates steady-state error but may introduce overshoot?

- a)P
- b)D
- c)PI
- d)PD

Answer: C

3106. The derivative term in a PID controller is used to:

- a)Remove steady-state error
- b)Reduce noise
- c)Predict future error
- d)Increase response time

Answer: C

3107. Which of the following controllers reacts to both the magnitude and rate of change of error?

- a)PI
- b)P
- c)PD
- d)I

Answer: C

3108. In PLC programming, PID control is usually implemented through:

- a)Latches
- b)Shift Registers
- c)Function Blocks
- d)Pulse Width Modulation

Answer: C

3109. Which of the following controller types is least commonly implemented in PLCs due to slow response?

- a)P
- b)D
- c)I
- d)PD

Answer: C

3110. In PLCs like Siemens or Allen-Bradley, PID tuning is often adjusted using:

- a)Relay settings
- b)Encoder values
- c)HMI or SCADA interface
- d)Analog input address

Answer: C

3111. Which of the following is not required in implementing PID in a PLC?

- a) Error signal calculation
- b) Timer or scan cycle time
- c) Proportional gain
- d) EPROM chip

Answer: D

3112. If a temperature control loop overshoots the setpoint repeatedly, the issue might be:

- a) Low integral gain
- b) High proportional gain
- c) Low derivative time
- d) Excessive dead time

Answer: B

3113. In flow control using a PLC, which control mode is typically most effective?

- a) On-Off
- b) PI or PID
- c) PD
- d) I only

Answer: B

3114. For pressure control loops, derivative action is usually added to:

- a) Eliminate steady-state error
- b) Increase system delay
- c) Reduce sudden changes
- d) Increase scan time

Answer: C

3115. A high integral gain (K_i) in a PLC PID loop may cause:

- a) Fast decay
- b) Oscillations or instability
- c) Low response
- d) Increased dead time

Answer: B

3116. The PLC scan time affects PID control because:

- a) PID works only in analog
- b) Control calculations depend on consistent update intervals
- c) Derivative is disabled
- d) Setpoint becomes invalid

Answer: B

3117. In PLCs, automatic PID tuning typically adjusts which parameters?

- a) Sampling frequency only
- b) K_p , K_i , K_d
- c) Sensor gain
- d) PID timer

Answer: B

3118. Which of the following is the primary purpose of calibration?

- a) To adjust an instrument to read zero.
- b) To determine the accuracy of an instrument by comparing it to a known standard.
- c) To increase the precision of a measuring instrument.
- d) To make an instrument easier to use.

Answer: B

3119. A traceable standard is one that:

- a) Can be easily transported.
- b) Is directly calibrated against a primary standard.
- c) Has an unbroken chain of comparisons linking it to a recognized national or international standard.
- d) Is less expensive than other types of standards.

Answer: C

3120. What is a primary standard?

- a) A standard used for daily calibrations in a workshop.
- b) The highest level of standard, usually maintained by national metrology institutes.
- c) A standard that is calibrated against a secondary standard.
- d) A commercially available, off-the-shelf calibration tool.

Answer: B

3121. The uncertainty of a measurement:

- a) Should always be zero after calibration.
- b) Indicates the range within which the true value is believed to lie.
- c) Is only important for primary standards.
- d) Can be completely eliminated through careful calibration.

Answer: B

3122. The frequency of calibration for an instrument should be determined by factors such as:

- a) The color of the instrument.
- b) The weight of the instrument.
- c) The required accuracy, usage frequency, and environmental conditions.
- d) The operator's preference.

Answer: C

3123. A secondary standard is:

- a) Used to calibrate primary standards.
- b) Directly realized from the definition of a measurement unit.
- c) Calibrated against a primary standard.
- d) Less accurate than a working standard.

Answer: C

3124. What is the purpose of a calibration certificate?

- a) To provide instructions on how to use the instrument.
- b) To document the results of the calibration and provide evidence of traceability.
- c) To guarantee the instrument will never go out of calibration.

d) To advertise the capabilities of the calibration laboratory.

Answer: B

3125. Which functional element of a measurement system is the first to interact with the quantity being measured?

- a) Data Presentation Element
- b) Variable Manipulation Element
- c) Primary Sensing Element
- d) Data Transmission Element

Answer: C

3127. A thermocouple, which converts temperature into a voltage, is an example of a:

- a) Variable Manipulation Element
- b) Data Presentation Element
- c) Primary Sensing Element
- d) Data Transmission Element

Answer: C

3128. An amplifier used to increase the amplitude of a sensor's output signal is a:

- a) Primary Sensing Element
- b) Variable Conversion Element
- c) Variable Manipulation Element
- d) Data Presentation Element

Answer: C

3129. What is the purpose of the Data Transmission Element in a measurement system?

- a) To convert the signal into a different form.
- b) To modify the signal for better processing.
- c) To carry the signal between physically separated components.
- d) To display the final measured value.

Answer: C

3130. A digital display showing the measured temperature is an example of a:

- a) Variable Manipulation Element
- b) Primary Sensing Element
- c) Data Transmission Element
- d) Data Presentation Element

Answer: D

3131. Which element might be used to convert a current signal from a sensor into a voltage signal for further processing?

- a) Variable Manipulation Element
- b) Variable Conversion Element
- c) Data Presentation Element
- d) Primary Sensing Element

Answer: C

3132. Filtering unwanted noise from a measurement signal is a function of the:

- a) Data Transmission Element

- b) Primary Sensing Element
- c) Variable Manipulation Element
- d) Data Presentation Element

Answer: C

3133. In a simple mercury-in-glass thermometer, the mercury bulb acting as the temperature-sensitive part is analogous to the:

- a) Variable Manipulation Element
- b) Data Presentation Element
- c) Primary Sensing Element
- d) Data Transmission Element

Answer: C

3134. Telemetry systems used to transmit data from a remote sensor are examples of:

- a) Variable Conversion Elements
- b) Variable Manipulation Elements
- c) Data Transmission Elements
- d) Data Presentation Elements

Answer: C

3135. A chart recorder that plots the change in pressure over time is a type of:

- a) Variable Manipulation Element
- b) Primary Sensing Element
- c) Data Transmission Element
- d) Data Presentation Element

Answer: D

3136. Which of the following is a static characteristic of an instrument?

- a) Speed of Response
- b) Fidelity
- c) Accuracy
- d) Measuring Lag

Answer : c) Accuracy

3137. The ability of an instrument to consistently give the same reading for repeated measurements of the same quantity is known as:

- a) Accuracy
- b) Sensitivity
- c) Precision
- d) Resolution

Answer : c) Precision

3138. The smallest change in the input quantity that will cause a detectable change in the instrument's output is its:

- a) Sensitivity
- b) Range
- c) Resolution
- d) Linearity

Answer : c) Resolution

3139. Hysteresis in an instrument means that the output for a given input:

- a) Changes rapidly with time.
- b) Depends on whether the input is increasing or decreasing.
- c) Has a constant offset from the true value.
- d) Is not linearly proportional to the input.

Answer : b) Depends on whether the input is increasing or decreasing.

3140. Which of the following is a dynamic characteristic of an instrument?

- a) Threshold
- b) Drift
- c) Frequency Response
- d) Tolerance

Answer : c) Frequency Response

3141. The rapidity with which an instrument responds to changes in the measured quantity is its:

- a) Fidelity
- b) Speed of Response
- c) Measuring Lag
- d) Dynamic Error

Answer : b) Speed of Response

3142. The delay in the response of an instrument to a sudden change in the input is called:

- a) Drift b) Hysteresis c) Measuring Lag d) Sensitivity

Answer : c) Measuring Lag

3143. The degree to which an instrument indicates changes in the measured quantity without dynamic error is its:

- a) Precision b) Accuracy c) Fidelity d) Resolution

Answer : c) Fidelity

3144. A gradual and unwanted shift in the instrument's output over time, not due to a change in input, is known as:

- a) Hysteresis b) Drift c) Lag d) Threshold

b) Answer : Drift

3145. The range of input values over which an instrument is designed to operate is its:

- a) Resolution b) Sensitivity c) Range d) Accuracy

Answer : c) Range

3146. Which of the following is an active transducer?

- a) Thermistor
- b) **Thermocouple**
- c) Strain gauge
- d) LVDT

Answer B

3147. A passive transducer requires:

- a) No input power

b)External excitation

c)Amplifier

d)Sensor driver

Answer B

3148. Which of the following generates electrical output without external power?

a)RTD

b)Piezoelectric crystal

c)Capacitive sensor

d)Phototransistor

Answer B

3149. Which of the following is NOT an active transducer?

a)Photovoltaic cell

b)Thermocouple

c)Strain gauge

d)Piezoelectric sensor

Answer C

3150. Which of the following is a resistive transducer?

a)Potentiometer

b)LVDT

c)Capacitive microphone

d)Thermocouple

Answer A

3151. Strain gauges work on the principle of:

a)Change in inductance

b)Change in capacitance

c)Change in resistance

d)Photoelectric effect

Answer C

3152. A thermistor is used for measuring:

a)Pressure

b)Temperature

c)Flow

d)Displacement

Answer B

3153. The resistance of an RTD:

a)Decreases with temperature

b)Remains constant

c)Is not measurable

d)Increases with temperature

Answer D

3154. LVDT stands for:

a)Linear Variable Displacement Transducer

b) Linear Variable Differential Transformer

c) Light Variable Displacement Transducer

d) Low Voltage Displacement Transducer

Answer B

3155. The LVDT converts:

a) Temperature into voltage

b) Pressure into resistance

c) Linear displacement into voltage

d) Voltage into current

Answer C

3156. In inductive transducers, the output is based on:

a) Change in inductance

b) Change in resistance

c) Light absorption

d) Voltage generation

Answer A

3157. Which of the following is NOT true about inductive transducers?

a) Used for displacement

b) Works on Faraday's Law

c) Works on piezoelectric effect

d) May use magnetic coupling

Answer C

3158. Capacitive transducers change capacitance due to:

a) Change in distance or area

b) Change in current

c) Change in pressure only

d) Change in conductivity

Answer A

3159. A capacitive transducer can be used for:

a) Temperature measurement

b) Displacement and pressure measurement

c) Vibration analysis only

d) Frequency generation

Answer B

3160. In capacitive sensors, if distance between plates increases, capacitance:

a) Increases

b) Decreases

c) Remains constant

d) Becomes zero

Answer B

3161. Thermocouples work on the principle of:

- a) Seebeck effect
- b) Piezoelectric effect
- c) Photoelectric effect
- d) Hall effect

Answer: a

3162. In thermocouples, the emf generated depends on:

- a) Length of the wires
- b) Current passing through the wire
- c) Temperature difference between junctions**
- d) Voltage applied to the junction
- e) Answer C**

3163. Which of the following thermocouples has the highest temperature range?

- a) Type J
- b) Type K
- c) Type T
- d) Type R**

Answer D

3164. The cold (reference) junction of a thermocouple is usually maintained at:

- a) 0°C
- b) Room temperature
- c) Known fixed temperature**
- d) 100°C

Answer C

3165. RTDs work on the principle that the resistance of a metal:

- a) Decreases with temperature
- b) Remains constant
- c) Increases with temperature**
- d) Is not affected by temperature

Answer C

3166. The most commonly used material for RTD is:

- a) Copper
- b) Iron
- c) Platinum**
- d) Nickel

Answer C

3167. Which configuration of RTD compensates best for lead wire resistance?

- a) 1-wire
- b) 2-wire
- c) 3-wire**
- d) 4-wire

Answer C

3168. The temperature range of a standard platinum RTD (Pt100) is typically:

- a) 0°C to 100°C
- b) 0°C to 250°C
- c) -200°C to +850°C**
- d) -50°C to +500°C

Answer C

3169. The output voltage of a thermocouple is typically in the order of:

- a) Volts
- b) Millivolts
- c) Amperes
- d) Ohms

Answer B

3170. Which of the following is an advantage of using thermocouples for temperature measurement?

- a) High accuracy over a narrow temperature range.
- b) Requirement of an external power source.
- c) Wide temperature measurement range.
- d) High output impedance.

Answer C

3171. Thermistors are usually made from:

- a) Metal alloys
- b) Semiconductors**
- c) Copper wire
- d) Plastic

Answer B

3172. In thermistors, resistance typically:

- a) Increases with temperature
- b) Decreases with temperature**
- c) Remains constant
- d) Is unaffected by temperature

Answer B

3173. A thermistor with negative temperature coefficient (NTC) is used for:

- a) Light sensing
- b) Pressure measurement
- c) Temperature measurement**
- d) Flow measurement

Answer C

3174. Thermistors are best suited for:

- a) Small temperature ranges with high sensitivity**
- b) Large industrial temperature ranges
- c) Nuclear temperature measurement
- d) High-voltage applications

Answer A

3175. Which of the following thermocouple types is a "noble metal" thermocouple, typically

used for high-temperature applications?

- a) Type K (Chromel-Alumel)
- b) Type J (Iron-Constantan)
- c) Type T (Copper-Constantan)
- d) Type S (Platinum-Rhodium)

Answer D

3176. What are the primary metallic components of a Type N thermocouple?

- a) Nickel-Chromium and Nickel-Aluminum
- b) Iron and Constantan
- c) Nicrosil (Nickel-Chromium- Silicon alloy) and Nisil (Nickel-Silicon-Magnesium alloy)
- d) Platinum and Platinum-Rhodium alloy

Answer C

3177. What is a significant advantage of noble metal thermocouples (like Type S and R) over base metal thermocouples at very high temperatures?

- a) Higher EMF output.
- b) Lower cost.
- c) Better resistance to oxidation and corrosion in harsh environments.
- d) Higher sensitivity at low temperatures.

Answer C

3178. Compared to Type S thermocouples, Type R thermocouples generally have:

- a) Lower cost.
- b) Higher sensitivity.
- c) A slightly higher maximum operating temperature.
- d) Better resistance to reducing atmospheres.

Answer C

3179. Type S thermocouples are primarily used for:

- a) Low-temperature applications below 0°C.
- b) General-purpose applications up to 1200°C.
- c) High- temperature measurements, often in the range of 1000°C to 1600°C.
- d) Applications requiring very high sensitivity

Answer C

3180. Which thermocouple type is often preferred for applications in the aerospace industry and cryogenics due to its non-magnetic properties and good performance at low temperatures?

- a) Type J (Iron-Constantan)
- b) Type K (Chromel-Alumel)
- c) Type E (Chromel-Constantan)
- d) Type N (Nicrosil-Nisil)

Answer C

3181. Which thermocouple type is well-suited for cryogenic temperature measurements?

- a) Type K (Chromel-Alumel)
- b) Type J (Iron-Constantan)
- c) Type T (Copper-Constantan)
- d) Type S (Platinum-Rhodium)

Answer C

3182. The fundamental principle of a strain gauge is the change in its ____ with applied strain.

- a) Voltage
- b) Current
- c) Resistance
- d) Capacitance

Answer C

3183. Which of the following materials is commonly used for the resistive element in metallic strain gauges due to its low-temperature sensitivity?

- a) Copper
- b) Aluminum
- c) Constantan
- d) Iron

Answer C

3184. The purpose of electrical isolation in measurement systems is to:

- a) Increase current flow
- b) Improve power factor
- c) **Protect circuits and prevent ground loops**
- d) Reduce wire length

Answer C

3185. Which of the following provides electrical isolation in a circuit?

- a) Low-pass filter
- b) Reactor
- c) **Opto-isolator**
- d) Resistor

e) Answer C

3186. Isolation amplifiers are used to:

- a) Reduce voltage
- b) Multiply signal strength
- c) **Prevent interaction between input and output**
- d) Connect sensors directly to actuators

Answer C

3187. Ground loops can be avoided using:

- a) Shielded cable
- b) Common ground for all systems
- c) **Galvanic isolation**
- d) Increasing signal voltage

Answer C

3188. In instrumentation, signal grounding should ideally be:

- a) Connected to equipment body
- b) **At a single point (single-point ground)**
- c) Connected at multiple points
- d) Avoided completely

Answer B

3189. Improper grounding can lead to:

- a) High frequency generation
- b) **Signal noise and interference**
- c) Voltage spike filtering
- d) Zero signal transmission

Answer B

3190. The primary reason for grounding electronic instruments is:

- a) Reduce power consumption
- b) Safety and signal reference**
- c) Signal amplification
- d) Data storage

Answer B

3191. Shielding is mainly used to:

- a) Increase signal bandwidth
- b) Reduce power losses
- c) Block electromagnetic interference (EMI)**
- d) Amplify low signals

Answer C

3192. In shielded cables, the shield is usually connected to:

- a) Ground at one end**
- b) Both ends
- c) Neutral line
- d) Power line

Answer A

3193. Twisted pair wires help reduce:

- a) Voltage drops
- b) Electromagnetic interference (EMI)**
- c) Current loss
- d) Signal delay

Answer B

3194. Faraday cage is an example of:

- a) Grounding technique
- b) Optical shielding
- c) Electromagnetic shielding**
- d) Electrical insulation

Answer C

3195. Which of the following is an open-loop control system?

- a) Automatic electric iron
- b) Washing machine timer**
- c) Air conditioner with thermostat
- d) Cruise control in car

Answer B

3196. A closed-loop control system uses:

- a) Time delay
- b) Feedback**
- c) High voltage input
- d) Manual operation

Answer B

3197. Which of the following is an example of a closed-loop system?

- a) Traffic light system

- b) Electric heater with timer
 - c) Automatic room temperature control**
 - d) Water pump without float switch
- Answer C

3198. The main advantage of closed-loop control is:

- a) Low cost
 - b) Simple structure
 - c) Accuracy and disturbance rejection**
 - d) No need for sensors
- Answer C

3199. In open-loop systems, the output is:

- a) Not compared with the desired input**
 - b) Used for feedback
 - c) Always stable
 - d) Regulated by sensors
- Answer A

3200. A PD controller improves:

- a) Offset
 - b) System response speed and stability**
 - c) Integral action
 - d) On-off timing
- Answer B

3201. An On-Off controller works by:

- a) Continuously adjusting output
 - b) Modulating output based on time
 - c) Switching fully ON or OFF**
 - d) Using integral-only action
- Answer C

3202. Ziegler–Nichols tuning is based on:

- a) Mathematical modeling
 - b) Ultimate gain and oscillation period**
 - c) Time delay only
 - d) Trial circuits
- Answer B

3203. In trial-and-error tuning, the parameters are adjusted:

- a) Mathematically
 - b) Manually based on system response**
 - c) Using simulation tools
 - d) Automatically via microcontroller
- Answer B

3204. Which tuning method gives faster results but may cause temporary instability?

- a) Root locus

- b) Pole-zero tuning
- c) Ziegler–Nichols**
- d) Bode plot method

Answer C

3205. In Ziegler–Nichols method, the system is tuned until it:

- a. Completely stops
- b. Oscillates with constant amplitude**
- c. Loses input
- d. Drifts slowly

Answer B

3206. Trial-and-error tuning is best suited for:

- a) Non-critical or lab-scale systems**
- b) Highly sensitive control systems
- c) Automated feedback loops
- d) Satellite control

Answer A

3207. The Bourdon tube pressure gauge works on the principle of:

- a) Electromagnetic induction
- b) Thermal expansion
- c) Elastic deformation of a curved tube**
- d) Piezoelectric effect

Answer C

3208. What is the typical shape of a Bourdon tube?

- a) Spiral
- b) C-shaped**
- c) Flat
- d) Cylindrical

Answer B

3209. The Bourdon tube is best suited for:

- a) Measuring atmospheric pressure
- b) Measuring high pressures**
- c) Vacuum only
- d) Low-temperature measurements

Answer B

3210. When pressure is applied inside a Bourdon tube, it tends to:

- a) Shrink
- b) Stay the same
- c) Straighten**
- d) Collapse

Answer C

3211. Bourdon tube gauges are commonly used in:

- a) Electronic labs only

b)Industrial hydraulics and pneumatics

- c) Sound engineering
- d) Medical applications only

Answer B

3212. A diaphragm pressure sensor measures pressure by:

- a) Rotating a coil
- b)Flexing a thin membrane**
- c) Expanding a fluid
- d)Measuring vibration

Answer b

3213. Diaphragm sensors are particularly suitable for:

- a) Measuring voltage
- b)Low pressure or differential pressure**
- c) High AC current
- d)Corrosion monitoring

Answer B

3214. Which material is commonly used for diaphragm construction?

- a) Plastic
- b) Paper
- c)Stainless steel or silicon**
- d)Rubber only

Answer C

3215. Diaphragm elements are often used in:

- a) Open-loop speed control
- b)Digital manometers**
- c) Piezo buzzers
- d)Photo sensors

Answer B

3216. The main advantage of diaphragm pressure sensors is:

- a) Low accuracy
- b)High voltage requirement
- c)Sensitivity to low pressures**
- d)Heat resistance

Answer C

3217. Strain gauge pressure sensors work on the principle of:

- a) Piezoelectric effect
- b)Change in electrical resistance with deformation**
- c) Inductive reactance
- d)Capacitance variation

Answer B

3218. Strain gauges are usually mounted on a:

- a) Rubber sleeve

- b) Battery strip
- c) Flexible diaphragm or metallic element**
- d) Glass tube

Answer C

3219. Which circuit is commonly used to measure strain gauge output?

- a) RC circuit
- b) Oscillator circuit
- c) Wheatstone bridge**
- d) PID controller

Answer C

3220. The output of a strain gauge is typically in:

- a) Millivolts**
- b) Amperes
- c) Ohms
- d) Degrees

Answer A

3221. Strain gauge pressure transducers are used when:

- a) High current is involved
- b) Precise and linear measurement is needed**
- c) Long-range transmission is required
- d) Low cost is the priority

Answer B

3222. Thermocouples are best suited for:

- a) Measuring low pressure
- b) Measuring high temperatures (up to 1800°C)**
- c) Measuring humidity
- d) Measuring voltage drop

Answer B

3223. Which of the following is a common thermocouple type?

- a) Type A
- b) Type W
- c) Type K**
- d) Type Z

Answer B

3224. In thermocouples, the voltage produced is proportional to:

- a) Magnetic flux
- b) Temperature difference between junctions**
- c) Current through the wires
- d) Wire thickness

Answer B

3225. Cold junction compensation in thermocouples is used to:

- a) Cancel signal noise

b)Correct the reference junction temperature

c) Eliminate resistance

d) Amplify voltage

Answer B

3226. RTDs work on the principle that:

a) **Resistance of metals increases with temperature**

b) Voltage increases with pressure

c) Capacitance increases with time

d) Current decreases with light

Answer A

3227. Which metal is commonly used in RTDs?

a) Copper

b) Iron

c) Platinum

d) Silver

Answer C

3228. RTDs are typically more accurate than:

a) Resistors

b) Relays

c) Thermocouples

d) Batteries

e) Answer C

3229. What is a common RTD standard resistance at 0°C?

a) 50 Ω

b) 100 Ω (PT100)

c) 10 Ω

d) 1 k Ω

Answer C

3230. RTDs are not preferred for:

a) Precision measurements

b) Stability

c) Very high temperatures (>600°C)

d) Repeatability

Answer C

3231. A pyrometer is used for:

a) Low voltage measurement

b) Non-contact temperature measurement

c) AC frequency analysis

d) Humidity detection

Answer B

3232. Optical pyrometers work by comparing:

a) Resistance values

- b) Thermoelectric voltage
- c) Brightness of filament to target**
- d) Sound velocity

Answer C

3233. Infrared pyrometers detect:

- a) Sound waves
- b) Thermal radiation from the object**
- c) Pressure pulses
- d) Electric fields

Answer B

3234. Pyrometers are ideal for measuring temperature of:

- a) Moving or inaccessible objects**
- b) Cold storage units
- c) RTDs
- d) Gas flow rate

Answer A

3235. Limitation of optical pyrometer is that it cannot measure:

- a) Red-hot metal
- b) Steady temperature
- c) Transparent or non-luminous objects**
- d) Surface roughness

Answer C

3236. The principle behind the Venturi meter is based on:

- a) Newton's Law
- b) Bernoulli's principle**
- c) Pascal's Law
- d) Boyle's Law

Answer B

3237. The pressure drop in a Venturi meter occurs at:

- a) Inlet
- b) Throat section**
- c) Outlet
- d) Expansion cone

Answer B

3238. Venturi meters are generally used for:

- a) Solid measurement
- b) Vacuum testing
- c) Measuring fluid flow with low pressure loss**
- d) Measuring humidity

Answer C

3239. Main advantage of Venturi meter over orifice plate is:

- a) High cost

- b) Large size
 - c) Lower permanent pressure loss**
 - d) Use with gases only
- Answer C

3240. A Venturi meter consists of:

- a) Orifice and float
 - b) Flange and pipe
 - c) Converging cone, throat, and diverging cone**
 - d) U-tube and manometer
- Answer C

3241. An orifice plate measures flow by creating:

- a) Vibration
 - b) Pressure drop across a restriction**
 - c) Magnetic field
 - d) Thermal change
- Answer B

3242. Compared to a Venturi meter, an orifice plate:

- a) Is more accurate
 - b) Is less expensive and easier to install**
 - c) Requires more space
 - d) Cannot be used with water
- Answer B

3243. Disadvantage of orifice plate is:

- a) Simplicity
 - b) High permanent pressure loss**
 - c) Cost
 - d) Linear output
- Answer B

3244. The orifice plate is placed between:

- a) Thermocouples
 - b) Flanges**
 - c) Batteries
 - d) Electrical contacts
- Answer B

3245. Flow through orifice plate is proportional to:

- a) Area squared
 - b) Pressure
 - c) Square root of differential pressure**
 - d) Temperature
- Answer C

3246. Rotameter is a type of:

- a) Variable area flowmeter**

- b) Fixed-area flowmeter
- c) Magnetic sensor
- d) Ultrasonic gauge

Answer C

3247. In a rotameter, the float rises when:

- a) Pressure increases
- b) Flow rate increases**
- c) Temperature decreases
- d) Resistance increases

Answer B

3248. The float in a rotameter comes to rest when:

- a) Frictional forces are maximum
- b) Drag force equals weight of float**
- c) Fluid stops
- d) Pressure is zero

Answer B

3249. Rotameters are generally mounted:

- a) Horizontally
- b) Diagonally
- c) Vertically with fluid flowing bottom to top**
- d) Upside-down

Answer C

3250. Rotameter is not suitable for:

- a) Measuring air
- b) Opaque or dirty fluids**
- c) Measuring low pressure
- d) Lab-scale flow rates

Answer B

3251. Electromagnetic flowmeters work on:

- a) Piezoelectric effect
- b) Faraday's law of electromagnetic induction**
- c) Doppler shift
- d) Capacitance change

Answer B

3252. Electromagnetic flowmeters can measure:

- a) Only conductive fluids**
- b) Only gases
- c) Solids and slurries
- d) All types of flows

Answer A

3253. Main advantage of electromagnetic flowmeter is:

- a) High pressure loss

- b) Complex calibration
 - c) No moving parts and accurate reading**
 - d) Works with steam
- Answer C

3254. Ultrasonic flowmeters measure flow by using:

- a) Magnetic field strength
 - b) Optical sensors
 - c) Time of flight or Doppler effect**
 - d) Friction loss
- Answer C

3255. Ultrasonic flowmeters are suitable for:

- a) Static liquids
 - b) Clean or dirty liquids, including slurries**
 - c) Solid particles
 - d) Magnetic fluids only
- Answer B

3256. A strip chart recorder records:

- a) In binary form
 - b) In decimal only
 - c) Continuously on a paper roll**
 - d) In time intervals only
- Answer C

3257. Which type of recorder is commonly used to monitor 24-hour temperature cycles?

- a) Strip chart recorder
 - b) Circular chart recorder**
 - c) X-Y recorder
 - d) Digital oscilloscope
- Answer B

3258. In a digital recorder, data is recorded as:

- a) Analog signals
 - b) Digital signals (binary data)**
 - c) Sound waves
 - d) Mechanical movement
- Answer B

3259. An X-Y recorder is used to:

- a) Record time series only
 - b) Measure voltage only
 - c) Plot one variable against another**
 - d) Measure flow rate
- Answer C

3260. Which recorder offers both analog chart and digital display?

- a) Strip chart recorder

- b) Circular chart recorder
- c) Digital recorder
- d) Hybrid recorder**

Answer D

3261. Which of the following is NOT a function of a recorder?

- a) Data logging
- b) Process visualization
- c) Real-time control**
- d) Historical analysis

Answer C

3262. In a circular chart recorder, the paper usually completes one rotation in:

- a) 10 minutes
- b) 1 hour
- c) 24 hours**
- d) 1 second

Answer C

3263. Modern recorders often include:

- a) Only pens
- b) Only paper rolls
- c) USB data export, memory, and alarms**
- d) Mercury thermometers

Answer C

3264. Which component in a strip chart recorder moves to represent the variable?

- a) Chart paper
- b) Pen mechanism**
- c) Thermocouple
- d) Magnet

Answer B

3265. Which of these recorders would best record a variable vs variable graph?

- a) Strip chart
- b) Digital recorder
- c) Circular chart
- d) X-Y recorder**

Answer D

3266. The main function of an actuator is to:

- a) Sense temperature
- b) Generate electricity
- c) Perform mechanical action based on control signal**
- d) Store data

Answer C

3267. Which type of actuator uses compressed air for operation?

- a) Electric actuator

- b) Hydraulic actuator
- c) Pneumatic actuator**
- d) Piezoelectric actuator

Answer C

3268. Electric actuators are commonly used in:

- a) Manual valves
- b) Motor-operated valves**
- c) Magnetic flowmeters
- d) Fluid level sensing

Answer B

3269. Hydraulic actuators are preferred when:

- a) Low force is required
- b) Manual operation is sufficient
- c) High force and precision are required**
- d) Systems are lightweight

Answer C

3270. A control valve in a chemical plant is most commonly operated by:

- a) Thermocouple
- b) RTD
- c) Pneumatic actuator**
- d) Current transformer

Answer C

3271. Which actuator type provides the fastest response time?

- a) Hydraulic
- b) Electric
- c) Pneumatic**
- d) Thermal

Answer C

3272. The actuator system is generally controlled by a:

- a) Sensor
- b) Controller (PLC/DCS)**
- c) Motor starter
- d) Battery

Answer B

3273. Which actuator is most suitable for micro-positioning tasks?

- a) Pneumatic
- b) Hydraulic
- c) Piezoelectric**
- d) Thermal

Answer C

3274. An electric actuator converts:

- a) Thermal energy to motion

- b) Pressure to current
 - c) Electrical energy to motion**
 - d) Sound to voltage
- Answer C

3275. In HVAC systems, actuators are used to control:

- a) Sensors
 - b) Displays
 - c) Air dampers and valves**
 - d) Signal conditioning circuits
- Answer C

3276. A thermal actuator typically works on the principle of:

- a) Magnetism
 - b) Thermal expansion of materials**
 - c) Electrical resistance
 - d) Optical sensing
- Answer B

3277. Which of the following is an example of a thermal actuator?

- a) Solenoid valve
 - b) Wax motor**
 - c) Stepper motor
 - d) Ultrasonic sensor
- Answer B

3278. Thermal actuators are commonly used in:

- a) Audio amplifiers
 - b) Thermostatic radiator valves**
 - c) Electric drives
 - d) Optical encoders
- Answer B

3279. In a wax-type thermal actuator, the actuator movement occurs due to:

- a) Expansion of wax with temperature**
 - b) Flow of electric current
 - c) Compression spring action
 - d) Pressure drop
- Answer A

3280. The main advantage of a thermal actuator is:

- a) High speed
 - b) No need for external power once triggered by temperature**
 - c) Heavy-load capacity
 - d) High frequency switching
- Answer B

3281. Which characteristic is true for thermal actuators?

- a) Instant response

- b) Slow but smooth motion**
- c) High-frequency operation
- d) No hysteresis

Answer B

3282. Thermal actuators are mostly used in:

- a) Digital circuits
- b) Temperature control systems**
- c) High-speed robotics
- d) Power factor correction

Answer B

3283. A voltage-to-current converter produces an output current that is:

- a) Independent of input voltage
- b) Proportional to input voltage**
- c) Inversely proportional to load resistance
- d) Dependent only on supply voltage

Answer B

3284. Which type of amplifier is most commonly used in V-I converter circuits?

- a) Differential amplifier
- b) Operational amplifier**
- c) Class-D amplifier
- d) Isolation amplifier

Answer B

3285. The main reason to use a 4–20 mA current loop instead of voltage in industrial instrumentation is:

- a) Cost saving
- b) Better noise immunity and long-distance reliability**
- c) Faster transmission
- d) Higher power output

Answer B

3286. In a simple op-amp based V-I converter, the feedback resistor determines the:

- a) Supply voltage
- b) Output voltage swing
- c) Conversion ratio (gain)**
- d) Frequency response

Answer C

3287. Which one of the following is true for a voltage-to-current converter?

- a) Input is current, output is voltage
- b) Output current is constant for all loads
- c) Load current is controlled regardless of load resistance**
- d) Only works with AC signals

Answer C

3288. The transconductance of a V-I converter is expressed in:

- a) Ohms

- b) Volts
- c) Amps
- d) Siemens (A/V)**

Answer D

3289. A V-I converter with 1 V input and 100 Ω feedback resistor produces:

- a) 1 A
- b) 10 mA**
- c) 0.1 mA
- d) 100 A

Answer B

3290. In analog signal transmission, a V-I converter helps to:

- a) Eliminate distortion
- b) Maintain signal strength over long cables**
- c) Convert AC to DC
- d) Multiply voltage levels

Answer B

3291. Which of the following is NOT a typical application of V-I converters?

- a) Sensor data transmission
- b) Process control loops
- c) Wireless communication systems**
- d) Analog signal conditioning

Answer C

3292. The circuit that converts current back to voltage is called a:

- a) Amplifier
- b) Differentiator
- c) Current-to-voltage (I-V) converter**
- d) Comparator

Answer C

3293. An Electro-Pneumatic actuator converts an electrical signal to:

- a) Voltage output
- b) Pneumatic motion**
- c) Mechanical pressure
- d) Thermal energy

Answer b

3294. The I/P converter in an EP actuator converts:

- a) Pressure to current
- b) Voltage to resistance
- c) Current signal to pneumatic pressure**
- d) Flow to voltage

Answer C

3295. Which current range is typically used in EP actuator control?

- a) 0–5 V

- b) 220 V AC
 - c) 0–10 mA
 - d) 4–20 mA**
- Answer D

3296. In an EP system, the actuator moves the valve based on:

- a) Set pressure
- b) Manual rotation
- c) Electrical control signal**
- d) Pulse width modulation

Answer C

3297. Why are EP actuators preferred in process industries?

- a) Easy to install
- b) Compatible with standard control signals and safer in hazardous zones**
- c) Less expensive
- d) Require no power

Answer B

3298. The device that ensures correct valve position in EP systems is called:

- a) I/V converter
- b) Amplifier
- c) Positioner**
- d) Rectifier

Answer C

3299. A typical pneumatic pressure output range in EP actuators is:

- a) 0–10 bar
- b) 3–15 psi**
- c) 20–30 psi
- d) 1–2 psi

Answer B

3300. EP actuators are classified as:

- a) Manual control devices
- b) Final control elements**
- c) Primary sensors
- d) Display units

Answer B

3301. In which environment are EP actuators most beneficial?

- a) Vacuum
- b) Explosive or flammable areas**
- c) Clean room
- d) High voltage rooms

Answer B

3302. What is the main advantage of using a pneumatic actuator over an electric one?

- a) Less responsive

- b) Needs more maintenance
- c) Can operate in explosive environments**
- d) Requires high voltage

Answer C

3303. A flow transmitter typically gives output in the range of:

- a) 1–5 V
- b) 0–10 V
- c) 4–20 mA**
- d) 220 V AC

Answer C

3304. An orifice plate-based flow transmitter works on the principle of:

- a) Capacitance change
- b) Magnetic induction
- c) Differential pressure**
- d) Ultrasonic pulses

Answer C

3305. Which flow transmitter is best suited for conductive fluids?

- a) Turbine
- b) Electromagnetic**
- c) Ultrasonic
- d) Thermal

Answer b

3306. Coriolis flow transmitters are mainly used to measure:

- a) Pressure
- b) Mass flow rate**
- c) Level
- d) Temperature

Answer B

3307. Which of the following is NOT a primary element used in flow transmitters?

- a) Orifice plate
- b) Venturi tube
- c) Flow nozzle
- d) Strain gauge**

Answer D

3308. A pressure transmitter converts pressure into:

- a) Frequency
- b) Electrical signal**
- c) Voltage fluctuation
- d) Mechanical displacement

Answer B

3309. Gauge pressure is measured relative to:

- a) Vacuum
- b) Atmospheric pressure**

- c) Absolute zero
 - d) Sealed chamber
- Answer B

3310. A differential pressure transmitter can be used to measure:

- a) Flow only
- b) Vacuum only
- c) Both flow and level**
- d) Only static pressure

Answer C

3311. The output signal of most industrial pressure transmitters is:

- a) 4–20 mA**
- b) 24 V DC
- c) 0–5 V
- d) 10–50 mA

Answer A

3312. A smart pressure transmitter provides:

- a. Only analog output
- b. Digital output only
- c. Analog + digital (HART or Fieldbus) output**
- d. No output

Answer C

3313. DP flow transmitters work on which principle?

- a) Bernoulli's theorem
- b) Faraday's law
- c) Piezoelectric effect
- d) Doppler effect

Answer: a

3314. Which primary elements are used with DP flow transmitters?

- a) RTD and Thermistor
- b) Orifice plate, Venturi tube, Flow nozzle**
- c) Piezoelectric sensors
- d) Thermocouples

Answer: b

3315. In a DP flow meter, flow rate is proportional to:

- a) Pressure only
- b) Square root of pressure drop
- c) Square root of differential pressure**
- d) Inverse of pressure

Answer: c

3316. Electromagnetic flow transmitters operate on:

- a) Piezoelectric effect

- b) Doppler principle
- c) Faraday's law of electromagnetic induction**
- d) Bernoulli's principle

Answer: c

3317. What is the key requirement for using an electromagnetic flow transmitter?

- a) Clean air as medium
- b) Non-conductive fluid
- c) Conductive liquid**
- d) Transparent fluid

Answer: c

3318. The electrodes in a magmeter are used to measure:

- a) Temperature of fluid
- b) Flow direction
- c) Induced voltage proportional to flow rate**
- d) Electric field strength

Answer: c

3319. Ultrasonic flow meters are most suitable for:

- a) Dirty and viscous fluids
- b) Clean liquids and gases**
- c) Cryogenic liquids
- d) Magnetic fluids

Answer: b

3320. Which of the following techniques is used in ultrasonic flow measurement?

- a) Doppler and Thermal
- b) Transit-time and Doppler**
- c) Venturi and Rotameter
- d) Piezo and Pulse-width

Answer: b

3321. In ultrasonic flow meters, transducers are used to:

- a) Measure pressure
- b) Generate voltage
- c) Transmit and receive sound waves**
- d) Control temperature

Answer: c

3322. Coriolis flow meters measure:

- a) Volume flow
- b) Mass flow**
- c) Differential pressure
- d) Level

Answer: b

3323. Coriolis meters are widely used due to their:

- a) Simplicity

- b) Cost-effectiveness
- c) High accuracy and mass flow measurement**
- d) Low power usage

Answer: c

3324. The Coriolis effect in flow measurement causes:

- a) Voltage generation
- b) Tube deflection due to fluid inertia**
- c) Temperature change
- d) Magnetic field creation

Answer: b

3325. Turbine flow meters measure flow by sensing:

- a) Pressure head
- b) Electrical conductivity
- c) Rotational speed of a turbine blade**
- d) Sonic wave reflection

Answer: c

3326. Which type of fluid is ideal for turbine flow meters?

- a) Gas only
- b) Highly viscous oils
- c) Clean, low-viscosity liquids**
- d) Acidic slurries

Answer: c

3327. Turbine flow transmitters produce which type of output?

- a) Analog voltage
- b) 4–20 mA current
- c) Pulses proportional to flow**
- d) Temperature signals

Answer: c

3328. Gauge pressure is measured relative to:

- a) Vacuum
- b) Sealed chamber
- c) Atmospheric pressure**
- d) Differential reference

Answer: c

3329. If atmospheric pressure changes, gauge pressure readings:

- a) Remain unchanged
- b) May vary**
- c) Drop to zero
- d) Always increase

Answer: B

3330. Which of the following applications uses gauge pressure?

- a) Spacecraft cabin pressure

b) Tire pressure measurement

c) Barometric altitude

d) Absolute vacuum systems

Answer: B

3331. Absolute pressure is measured relative to:

a) Atmospheric pressure

b) Internal sensor reference

c) Gauge pressure

d) Perfect vacuum (zero pressure)

Answer: D

3332. Absolute pressure transmitters are used in:

a) HVAC systems

b) Vacuum chambers and altimeters

c) Car engine oil measurement

d) Level measurement only

Answer: B

3333. Which pressure type includes atmospheric pressure in its value?

a) Gauge pressure

b) Differential pressure

c) Absolute pressure

d) None

Answer: c

3334. Differential pressure transmitters measure the difference between:

a) Temperature and humidity

b) Absolute and gauge pressure

c) Two pressure points

d) Flow and pressure

Answer: c

3335. DP transmitters are widely used for:

a) Voltage regulation

b) Thermocouple sensing

c) Flow and level measurement

d) Conductivity measurement

Answer: c

3336. Which of the following primary elements is used with DP transmitters for flow?

a) Thermistor

b) Orifice plate

c) Rotameter

d) Strain gauge

Answer: b

3337. A differential pressure transmitter installed across a tank can measure:

a) Ambient pressure

- b) Liquid level**
- c) Gas concentration
- d) Pipe diameter

Answer: B

3338. In instrumentation, what type of sensors are usually connected to PLC analog inputs?

- a) Contact sensors
- b) Transmitters (temperature, pressure, level)**
- c) Relay coils
- d) Proximity switches

Answer: b

3339. A thermocouple signal must be connected to a PLC via:

- a) Digital input module
- b) Signal conditioner or temperature transmitter**
- c) Diode bridge
- d) Direct AC contactor

Answer: b

3340. A PID controller implemented in PLC is used for:

- a) Switching only
- b) Maintaining process variables like temperature, flow, pressure**
- c) Data logging
- d) PLC communication

Answer: b

3341. Which PLC instruction is commonly used for ON-OFF control in instrumentation?

- a) ADD
- b) CMP
- c) OUT (coil) with contacts**
- d) PID

Answer: c

3342. In PLC-based instrumentation, scaling 4–20 mA to engineering units (e.g., 0–100 °C) is done using:

- a) PID block
- b) Timer
- c) Scaling block or formula (math instruction)**
- d) Counter

Answer: c

3343. In a flow control loop, which element sends feedback to the PLC?

- a. VFD
- b. Pump
- c. Flow transmitter**
- d. Control valve

Answer: c

3344. When the PLC analog input reads 0 mA instead of 4 mA, it indicates:

- a) Sensor is healthy
- b) Input overload
- c) Sensor is disconnected or faulty**
- d) PLC is in STOP mode

Answer: c

3345. A fail-safe design in instrumentation using PLC ensures that:

- a) PLC restarts automatically
- b) Outputs go to safe state during power or signal failure**
- c) PLC never stops
- d) All alarms are ignored

Answer: b

3346. A load cell in a CNC press machine senses:

- a) Vibration
- b) Force or weight**
- c) Speed
- d) Flow

Answer: b

3347. In a CNC machine, position feedback is commonly provided by:

- a) RTD
- b) Linear encoder**
- c) Flow transmitter
- d) Pressure gauge

Answer: b

3348. Which device records temperature, pressure, or flow over time in a control room?

- a) VFD
- b) Digital data logger**
- c) Encoder
- d) Proximity sensor

Answer: b

3349. In modern PLC/CNC setups, data logging is handled by:

- a) Analog timers
- b) Relays
- c) SCADA or HMI systems with internal memory**
- d) Pneumatic recorders

Answer: c

3350. In CNC systems, noise in encoder signals is reduced by:

- a) Ignoring pulses
- b) Using signal filters (low-pass)**
- c) Using transformers
- d) None of these

Answer: b

3351. What is the role of an analog-to-digital converter in a PLC?

- a) Send signals
- b) Convert analog sensor values for digital processing**
- c) Provide 24 V DC
- d) Amplify signals

Answer: b

3352. Which of the following is a standard for industrial data transmission in PLC/CNC?

- a) HDMI
- b) Modbus or Profibus**
- c) USB
- d) RS-131

Answer: b

3353. What presents real-time process values to the operator in an automated industry?

- a) Encoder
- b) Recorder
- c) HMI (Human-Machine Interface)**
- d) Load cell

Answer: c

SPECIFIC APPLICATION IN SHOP AREAS

a) Block Schematic of temperature Control in Axle Shop

3354. The type of temperature sensor used in quench tank at Axle shop/RWF?

- a) RTD
- b) S type
- c) N type
- d) J type**

Answer :A

3355. The furnaces temperature in Old forge shop is controlled with the help of

- a) Open loop control system
- b) Closed loop control system
- c) Both A and B
- d) None of these

Answer :B

3356. The type of thermocouple used in Normalising Furnace of Axle Shop is

- a) S Type.
- b) K type.
- c) N type
- d) J type**

3357. The type of Thermocouple used in RHF of New Axle Forge Shop?

- a) S type
- b) R type
- c) J type
- d) N type

Answer: A

3358. PLC used for Temperature control in Old forge Complex is

- a) Allen Bradley
- b) Siemens
- c) Mitsubishi
- d) Fanuc

Answer: A

3359. PLC used for Temperature control in New forge Complex is

- a) Allen Bradley
- b) Siemens
- c) Mitsubishi
- d) Fanuc

Answer: B

3360. In the Schematic for Temperature Control for RHF, which element is responsible for measurement of Temperature

- a) Thermocouple
- b) PNG Pressure Transmitter
- c) Gas Control Valve
- d) Furnace pressure transmitter

3361. What is the main function of PLC(Allen Bradley) in Temperature Control system of RHF (Old Forge)

- a) Measure gas pressure
- b) Transmit Temperature Data to SCADA
- c) PID control to control temperature
- d) Increase gas supply

Answer : C

3362. In RHF , PID Controller output is used to modulate _____to control temperature

- a) HMI Display Value
- b) Thermocouple Voltage
- c) Flue gas measurement
- d) Gas & Air Control Valves

Answer : D

3363. What is the function of HMI display in Temperature Control system at Old forge complex

- a) To Send signal to control valves
- b) Measure Pressure
- c) Act as a back up controller
- d) Display process values & Set Point Entry

Answer : D

3364. In Temperature Control System at Forge shop, Which parameter is the process variable

(PV) for the PID loop

- a) Gas Valve opening percentage
- b) PNG Pressure
- c) Temperature measured by thermocouple
- d) Air pressure Answer : C

3365. The Flue gas temperature is measured, mainly in temperature control system of Forge shop mainly to

- a) Protect Thermocouple
- b) Adjust Combustion Air/Fuel for efficiency
- c) Regulate Cooling system
- d) Open bypass Valve Answer : B

3366. The Energy saving system used in RHF

- a) Recuperator
- b) Blower
- c) Compressor
- d) Charging Arm Answer :A

3367. Which of the following is not a part of Temperature control system

- a) PID Controller
- b) Thermocouple
- c) Furnace Door
- d) Gas flow control Valve Answer : C

3368. What is the typical working temperature of RHF in Axle shop

- a) Around 400 Deg C
- b) Around 700 Deg C
- c) Around 1000 Deg C
- d) Around 1200 Answer D

3369. What is the primary function of the Burner Control Unit (BCU) in a RHF system?

- A) To regulate furnace pressure
- B) To manage ignition, flame sensing, and burner safety interlocks
- C) To control air-fuel mixing ratios
- D) To monitor load temperature Answer: B)

3370. In RHF-NF-TF Temperature control system, the ignition transformer is used to:

- A) Increase flame detection sensitivity
- B) Control flue gas temperature
- C) Generate high-voltage spark for burner ignition
- D) Convert analog signals to digital

Answer: C)

3371. In the RHF control schematic, the flame sensor is used to:

- A) Detect thermocouple faults
- B) Verify successful burner ignition and continuous flame presence
- C) Measure oxygen levels in flue gas
- D) Monitor air pressure in the burner line

Answer: B)

3372. The Normalizing Furnace (NF) in axle treatment is primarily used to:

- A) Cool the axle rapidly
- B) Soften the axle for machining
- C) Refine the grain structure by heating above transformation temperature and air-cooling
- D) Harden the axle surface only

Answer: C)

3373. What happens if the flame sensor fails to detect a flame after ignition in RHF ?

- A) The PLC ignores it and continues
- B) The BCU continues gas flow
- C) The BCU shuts off fuel supply and generates a fault
- D) The thermocouple adjusts temperature

Answer: C

3374. Which device ensures that the burner does not operate when there's no flame or unsafe condition used for temperature control in RHF?

- A) PID controller
- B) Burner Control Unit (BCU)
- C) Furnace damper
- D) Air regulator

Answer: B

3375. In Old Forge Shop __ Which is True

- a) RHF, NF & TF Temperature is controlled by single PLC
- b) RHF & NF Temperature is controlled by single PLC
- c) NF & TF Temperature is controlled by single PLC
- d) All furnace Temperature controlled individually

Answer: A

3376. The Software required to Troubleshoot PLC of Temperature Control system in Old Forge Complex

a) Step 7	b) TIA Portal
c) Studio Logix 5000	c) Rs logic 500

Answer : C

3377. The software required to edit / modify HMI Screen of Temperature Control System

of RHF

- a) Factory Talk View
- c) TIA Portal

- b) HMI Advance
- c) Step7

Answer A

3378. In an RHF control system, the Air-Fuel Ratio (AFR) is maintained electronically to:

- A) Maximize flue gas temperature
 - B) Ensure complete combustion and optimize thermal efficiency
 - C) Increase furnace load quickly
 - D) Improve ignition transformer output
- Answer: B)

3379. What is the effect of an improper AFR (too rich or too lean) in a gas-fired furnace?

- A) PID controller resets automatically
 - B) Lower burner life and increased unburned fuel emissions
 - C) Enhanced thermal efficiency
 - D) Improved PLC scan time
- Answer: B)

3380. In PID-based electronic control for PNG burning(NF), what does the integral term (I) primarily help to eliminate?

- A) Overshoot
- B) High frequency noise
- C) Steady-state error
- D) Sensor drift

Answer: C)

3381. The operator claims that temperature is not attaining 1200 Degree C In RHF. It was noticed that SP of Temperature is 1020 Degree & PV is 1025 Degree. Possible Cause for Temperature not attaining 1200 Degree.

- A) Operator has wrongly set 1020 Degree instead of 1200
- B) Burner Trips
- C) Less Gas pressure
- D) Low Air Pressure

Answer : A

3382. In a PLC-based PID loop used in RHF , the derivative term (D) is used to:

- A) Eliminate steady-state error
 - B) Reduce overshoot
 - C) Convert analog input to digital
 - D) Stabilize voltage fluctuations
- Answer: B)

3383. Which of the following is used as the manipulated variable in a PID loop controlling NF temperature in a PLC?

- A) S-type thermocouple
- B) Gas/Air control valve position
- C) Furnace door actuator
- D) PLC scan cycle timer

Answer: B)

3384. A PID block in PLC gets its process variable (PV) from:

- A) The output of the burner
- B) The HMI
- C) The connected sensor (thermocouple)
- D) The operator panel

Answer: C

3385. In a PLC logic diagram, the setpoint (SP) for temperature control is:

- A) Always hardcoded in the PLC firmware
- B) The maximum value from the thermocouple
- C) User-defined input through HMI or SCADA
- D) Measured by the flame sensor

Answer: C)

3386. typical advantage of using PLC-based PID control in furnaces is:

- A) Higher gas pressure output
- B) Constant furnace temperature regardless of load
- C) Real-time control with flexibility for tuning and interlocks
- D) Automatic replacement of faulty sensors

Answer C

3387. In New Forge Complex, RHF Control system

- a) Displays all zone temperature & Burner Status
- b) Displays only zone wise temperature
- c) Displays only Burner Status
- D) Display Only Specific zones status

Answer :A

3388. In NAFL, RHF Temperature control system exchanges signals with

- a) Long Forging Machine's Control System
- b) Distributed Control System Used for Conveyor & Coordination
- c) Both A&B
- d) None

Answer :C

3389. What is the main goal of temperature control in axle and wheel shop furnaces?

- A) To improve fuel economy
- B) To maintain accurate and consistent heating
- C) To reduce noise
- D) To cool down components faster

Correct Answer: B

3390. In a basic temperature control block schematic, the **sensor** function is to:

- A) Control power to the heater
- B) Detect the current furnace temperature
- C) Move the axle
- D) Rotate the wheel

Correct Answer: B

3391. What is the **setpoint** in a temperature control system?

- A) Current temperature
- B) Target temperature to maintain
- C) Oil pressure
- D) Speed of cooling fan

Correct Answer: B

3392. The **controller** in the block schematic:

- A) Opens the furnace door
- B) Compares actual temperature with setpoint and sends signal to actuator
- C) Measures air pressure
- D) Maintains room temperature

Correct Answer: B

3393. Which component adjusts fuel or power supply to maintain the desired temperature?

- A) Thermometer
- B) Sensor
- C) Actuator (e.g., burner or heating element)
- D) Switch

Correct Answer: C

3394. The **feedback loop** in a control system helps to:

- A) Keep a constant voltage
- B) Compare input and output for correction
- C) Increase heating rate only
- D) Maintain humidity

Correct Answer: B

3395. A **thermocouple** is commonly used in furnaces because it:

- A) Provides fast response and high accuracy
- B) Measures pressure
- C) Works without electricity
- D) Acts as a heating coil

Correct Answer: A

3396. A **PID controller** is often used in temperature control because it:

- A) Reacts instantly to setpoint change only
- B) Provides stable and accurate temperature control
- C) Is the cheapest option
- D) Requires no sensors

Correct Answer: B

3397. In the block schematic, the **error signal** is:

- A) A hardware fault
- B) The difference between setpoint and actual temperature
- C) The average of all temperatures
- D) The cooling time

Correct Answer: B

3398. In a wheel shop furnace, overheating can result in:

- A) Better fuel efficiency
- B) Metallurgical damage or soft wheels
- C) Faster cooling
- D) Improved axle strength

Correct Answer: B

3399. The **actuator** in an electric furnace may include:

- A) Thermostat
- B) Relay or contactor for heater
- C) Load cell
- D) Pressure sensor

Correct Answer: B

3400. Which is **NOT** a common component in a simple block diagram of temperature control?

- A) Sensor
- B) Controller
- C) Air compressor
- D) Actuator

Correct Answer: C

3401. What type of signal is typically sent from the sensor to the controller?

- A) Mechanical signal
- B) Analog electrical signal
- C) Hydraulic signal
- D) Light signal

Correct Answer: B

3402. The **process variable** in temperature control systems is:

- A) Target temperature
- B) Current measured temperature
- C) Control knob setting
- D) Door position

Correct Answer: B

3403. A common output from the controller to the actuator is:

- A) Manual switch signal
- B) Control voltage or current
- C) Heat sensor feedback
- D) Wheel rotation data

Correct Answer: B

3404. In axle shop furnaces, temperature uniformity is crucial for:

- A) Preventing corrosion
- B) Proper hardening and stress relief
- C) Increasing axle diameter
- D) Avoiding paint failure

Correct Answer: B

3405. The **simplest control method** in temperature systems is:

- A) ON-OFF control
- B) PID control
- C) Fuzzy logic control
- D) Neural network control

Correct Answer: A

3406. Which control method avoids large temperature swings better than ON-OFF?

- A) Manual control
- B) Proportional control
- C) Visual control
- D) Relay control

Correct Answer: B

3407. In a simple block schematic, the output of the sensor is routed to the:

- A) Actuator
- B) Heater
- C) Controller
- D) Air compressor

Correct Answer: C

3408. Which of the following is a typical **disturbance** in furnace temperature control?

- A) Furnace door opening
- B) Fan switching
- C) Temperature sensor failure
- D) All of the above

Correct Answer: D

3409. If the actual temperature is lower than the setpoint, the controller will:

- A) Turn off heating
- B) Increase fuel or electrical power to the heater
- C) Open the door
- D) Turn on the fan

Correct Answer: B

3410. Which parameter in a PID controller removes steady-state error?

- A) Proportional
- B) Integral
- C) Derivative
- D) Modulating

Correct Answer: B

3411. Why is **real-time feedback** necessary in wheel and axle shop furnaces?

- A) To control water flow
- B) To monitor operator breaks
- C) To maintain the exact temperature required for treatment
- D) To count number of axles

Correct Answer: C

3412. The **scan cycle** of a digital temperature controller includes:

- A) Sensor reading → Logic computation → Output control
- B) Heating → Cooling → Reset
- C) Program load → Shutdown → Alarm
- D) Operator start → Manual override

Correct Answer: A

3413. Which system is more reliable for precise furnace control in wheel and axle shops?

- A) Manual control
- B) Closed-loop temperature control
- C) Fan control
- D) Pressure switch

Correct Answer: B

b) Block System of Thyristor Controls in Cranes/DC Drives

3414. What is the full form of SCR?

- A) Silicon Controlled Rectifier
- B) Sequential Current Relay
- C) Series Controlled Resistor
- D) Silicon Capacitor Rectifier

Correct: A

3415. A thyristor can be turned on by:

- A) Increasing supply voltage
- B) Decreasing supply voltage
- C) Applying a gate pulse
- D) Opening the anode circuit

Correct: C

3416. Once turned on, an SCR remains conducting until:

- A) Gate signal is removed
- B) Anode current falls below holding current

- C) Anode voltage increases
- D) Gate voltage reaches zero

Correct: B

3417. **Which of the following is a three-terminal device?**

- A) Diode
- B) SCR
- C) MOSFET
- D) Triac

Correct: B

3418. **Holding current is defined as:**

- A) Minimum gate current to turn on the thyristor
- B) Maximum gate current
- C) Minimum anode current to keep SCR conducting
- D) Peak reverse current

Correct: C

3419. **Latching current in SCR is:**

- A) Always equal to holding current
- B) Less than holding current
- C) Greater than holding current
- D) Equal to peak current

Correct: C

3420. **Gate triggering current is generally:**

- A) AC current
- B) High-frequency current
- C) Low-magnitude DC current
- D) Very high-magnitude current

Correct: C

3421. **The forward blocking mode of SCR occurs when:**

- A) Anode is negative w.r.t cathode
- B) Gate current is zero
- C) Anode is positive w.r.t cathode but no gate signal is applied
- D) Gate current is high

Correct: C

3422. **The typical on-state voltage drop across an SCR is:**

- A) 0.1V
- B) 1V to 2V
- C) 10V
- D) 5V

Correct: B

3423. **Which one of the following determines the maximum current rating of an SCR?**

- A) Gate current
- B) Forward breakover voltage
- C) Thermal resistance
- D) Peak reverse voltage

Correct: C

3424. **Which is not a method of triggering an SCR?**

- A) Thermal triggering
- B) Light triggering
- C) Gate triggering
- D) Magnetic triggering

Correct: D

3425. **Natural commutation occurs in:**

- A) DC circuits
- B) AC circuits
- C) Choppers
- D) Inverters

Correct: B

3426. **In class-F commutation:**

- A) External capacitor is used
- B) Line voltage assists commutation
- C) Gate current is reversed
- D) RC network is used

Correct: B

3427. **Which method of commutation is used in HVDC transmission?**

- A) Natural commutation
- B) Forced commutation
- C) Line commutation
- D) Voltage commutation

Correct: B

3428. **Turn-off time of a thyristor is defined as:**

- A) Time required to switch ON
- B) Time between gate signal and conduction
- C) Time taken to regain forward blocking state
- D) Time to build up reverse voltage

Correct: C

3429. **A full-wave rectifier using thyristors is also known as:**

- A) Uncontrolled rectifier
- B) Controlled bridge rectifier
- C) Half converter
- D) Chopper

Correct: B

3430. **In a half-wave controlled rectifier, the output depends on:**

- A) Load impedance
- B) Firing angle
- C) Supply frequency
- D) Reverse recovery time

Correct: B

3431. **In a single-phase full converter, how many SCRs are used?**

- A) 1
- B) 2
- C) 4

D) 6

Correct: C

3432. **In a full converter, if firing angle $\alpha = 90^\circ$, the average output voltage is:**

- A) Zero
- B) Maximum
- C) Negative
- D) Infinity

Correct: A

3433. **The main disadvantage of using thyristors in power circuits is:**

- A) High efficiency
- B) Unidirectional conduction
- C) High-speed switching
- D) Compact size

Correct: B

3434. **Snubber circuits are used to protect SCRs from:**

- A) High temperature
- B) High gate current
- C) High dv/dt
- D) High power factor

Correct: C

3435. **A typical snubber circuit includes:**

- A) Diode only
- B) Resistor and inductor
- C) Resistor and capacitor
- D) Capacitor and diode

Correct: C

3436. **The function of a freewheeling diode is to:**

- A) Reduce voltage
- B) Allow negative cycle
- C) Provide a path for inductive load current
- D) Protect gate terminal

Correct: C

3437. **SCRs are protected from overcurrent using:**

- A) RC snubber
- B) Series fuse
- C) Zener diode
- D) Filter capacitor

Correct: B

3438. **Which of the following faults is a thyristor most sensitive to?**

- A) Low-frequency noise
- B) dv/dt and overcurrent
- C) High-frequency switching
- D) Gate leakage

Correct: B

3439. **Choppers convert:**

- A) AC to DC
- B) DC to AC
- C) Fixed DC to variable DC
- D) DC to constant voltage

Correct: C

3440. **In voltage commutated chopper, turn-off is achieved by:**

- A) Interrupting gate current
- B) Applying a reverse voltage
- C) Using zero crossing
- D) None of the above

Correct: B

3441. **An inverter is a circuit that converts:**

- A) DC to AC
- B) AC to DC
- C) AC to AC
- D) DC to DC

Correct: A

3442. **Which type of thyristor is used in high-frequency inverter circuits?**

- A) SCR
- B) TRIAC
- C) GTO
- D) DIAC

Correct: C

3443. **The main challenge in thyristor-based inverters is:**

- A) Size
- B) Weight
- C) Commutation
- D) Input voltage

Correct: C

3444. **Thyristors are primarily used in:**

- A) Signal processing
- B) Power control
- C) Data storage
- D) Communication circuits

Correct: B

3445. **A TRIAC is a:**

- A) Bidirectional SCR
- B) Unidirectional diode
- C) Type of transistor
- D) DC chopper

Correct: A

3446. **The gate terminal of SCR is used to:**

- A) Block current
- B) Cool the device
- C) Initiate conduction

D) Measure voltage

Correct: C

3447. **Reverse blocking mode of SCR is when:**

- A) Gate current is applied
- B) Anode is negative w.r.t cathode
- C) SCR is turned on
- D) Anode is positive w.r.t cathode

Correct: B

3448. **Which component can turn off a thyristor without external commutation?**

- A) TRIAC
- B) GTO
- C) DIAC
- D) SCR

Correct: B

3449. **dv/dt protection prevents:**

- A) False turn-off
- B) False turn-on
- C) Excessive power loss
- D) Gate noise

Correct: B

3450. **Which device is not suitable for bidirectional control?**

- A) TRIAC
- B) DIAC
- C) SCR
- D) MOSFET

Correct: C

3451. **The forward breakover voltage is the voltage at which:**

- A) SCR turns off
- B) SCR conducts without gate signal
- C) Gate resistance burns out
- D) Reverse leakage increases

Correct: B

3452. **In thyristor terminology, "GTO" stands for:**

- A) Gate-Turn-Off
- B) Gate-Time-On
- C) General Turn-Off
- D) Gate-Triggered Oscillator

Correct: A

3453. **Which device helps in turning ON the TRIAC?**

- A) MOSFET
- B) DIAC
- C) IGBT
- D) BJT

Correct: B

3454. **The holding current of an SCR is:**

- A) The current needed to turn it on
- B) The minimum current to keep it on after firing
- C) The maximum current it can handle
- D) The gate current required to trigger

Correct: B

3455. **Which of the following is a two-terminal bidirectional device?**

- A) SCR
- B) DIAC
- C) TRIAC
- D) GTO

Correct: B

3456. **The main function of a commutation circuit is to:**

- A) Trigger the SCR
- B) Turn off the SCR
- C) Protect the SCR from voltage spikes
- D) Amplify the output signal

Correct: B

3457. **Which parameter limits the rate of rise of anode current?**

- A) dv/dt
- B) di/dt
- C) Holding current
- D) Latching current

Correct: B

3458. **In a phase-controlled rectifier, power control is done by:**

- A) Varying frequency
- B) Varying firing angle
- C) Changing load resistance
- D) Changing supply voltage

Correct: B

3459. **A DIAC is mainly used as a:**

- A) Trigger device for TRIAC
- B) High power rectifier
- C) Voltage regulator
- D) Frequency modulator

Correct: A

3460. **Which of the following devices has four layers of P and N type material?**

- A) Diode
- B) BJT
- C) SCR
- D) MOSFET

Correct: C

3461. **What is the typical turn-on time of an SCR?**

- A) A few microseconds
- B) A few milliseconds
- C) A few seconds

D) Several nanoseconds

Correct: A

3462. **A GTO thyristor is different from an SCR in that it can be:**

- A) Turned on by gate current
- B) Turned off by gate current
- C) Triggered by light
- D) Triggered by heat

Correct: B

3463. **Which device can conduct current in both directions when triggered?**

- A) SCR
- B) TRIAC
- C) GTO
- D) Diode

Correct: B

3464. **The thyristor turns on when:**

- A) Gate current is zero
- B) Anode voltage is negative
- C) Gate pulse is applied and anode is positive
- D) Cathode is more positive than anode

Correct: C

3465. **Thyristor acts as a:**

- A) Voltage controlled switch
- B) Current controlled switch
- C) Gate controlled rectifier
- D) Light controlled amplifier

Correct: C

3466. **In a thyristor, when gate current is increased:**

- A) Turn-on time decreases
- B) Turn-on time increases
- C) Holding current increases
- D) Breakover voltage increases

Correct: A

3467. **The gate of SCR is always connected to:**

- A) Cathode
- B) Anode
- C) Positive terminal
- D) Negative terminal

Correct: A

3468. **Which of these is a bidirectional device?**

- A) SCR
- B) TRIAC
- C) GTO
- D) UJT

Correct: B

3469. **The reverse recovery time of a thyristor is the time it takes to:**

- A) Turn on
- B) Turn off
- C) Recover from short-circuit
- D) Restore blocking state

Correct: B

3470. **TRIAC can conduct in:**

- A) Only positive half cycle
- B) Only negative half cycle
- C) Both positive and negative half cycles
- D) Forward blocking mode

Correct: C

3471. **SCR is made of how many layers of semiconductor material?**

- A) 2
- B) 3
- C) 4
- D) 5

Correct: C

3472. **The DIAC is used primarily to:**

- A) Trigger a TRIAC
- B) Filter DC supply
- C) Rectify AC
- D) Reduce frequency

Correct: A

3473. **The device which can be turned ON and OFF using gate signals is:**

- A) SCR
- B) TRIAC
- C) GTO
- D) DIAC

Correct: C

3474. **A thyristor is turned off by:**

- A) Applying gate pulse
- B) Reversing supply
- C) Reducing anode current below holding current
- D) Increasing gate voltage

Correct: C

3475. **Thyristors are mainly used in:**

- A) Audio amplifiers
- B) Low power circuits
- C) Digital memory
- D) Power electronics

Correct: D

3476. **In an SCR, forward breakover voltage is the minimum voltage at which:**

- A) It turns off
- B) It conducts without gate signal
- C) It reverses polarity

D) Gate burns out

Correct: B

3477. **Which of the following is used to commutate a thyristor in a chopper circuit?**

- A) Resistor
- B) Capacitor
- C) Inductor
- D) Diode

Correct: B

3478. **Class D commutation is also known as:**

- A) Load commutation
- B) Resonant commutation
- C) Auxiliary commutation
- D) Voltage commutation

Correct: C

3479. **In Class A commutation, the commutation is achieved by:**

- A) AC supply
- B) External supply
- C) Load current itself
- D) Gate signal

Correct: C

3480. **In a TRIAC, conduction is controlled in:**

- A) One direction
- B) Both directions
- C) Only during positive cycle
- D) Only during negative cycle

Correct: B

3481. **For turning off a conducting TRIAC, we need to:**

- A) Reduce voltage
- B) Apply gate current
- C) Reduce current below holding current
- D) Reverse the gate polarity

Correct: C

3482. **In an SCR, reverse recovery time is important for:**

- A) Commutation
- B) Triggering
- C) Holding
- D) Latching

Correct: A

3483. **The static dv/dt rating of SCR indicates its:**

- A) Thermal stability
- B) Latching current
- C) Susceptibility to false triggering
- D) Gate triggering sensitivity

Correct: C

3484. **Which is the correct order of SCR terminals (left to right)?**

- A) Gate, Anode, Cathode
- B) Anode, Cathode, Gate
- C) Cathode, Gate, Anode
- D) Anode, Gate, Cathode

Correct: D

3485. **Which device is most commonly used for AC voltage control in fan regulators?**

- A) SCR
- B) MOSFET
- C) TRIAC
- D) BJT

Correct: C

3486. **TRIACs are suitable for:**

- A) DC-only loads
- B) AC-only loads
- C) High-frequency loads
- D) Battery chargers

Correct: B

3487. **SCRs are preferred in power control because of:**

- A) High switching speed
- B) High gain
- C) High efficiency
- D) High frequency

Correct: C

3488. **Which of the following devices is used for triggering TRIACs in phase control circuits?**

- A) Zener diode
- B) UJT
- C) DIAC
- D) LED

Correct: C

3489. **UJT is used in thyristor circuits mainly for:**

- A) Amplification
- B) Protection
- C) Triggering
- D) Commutation

Correct: C

3490. **Which of the following thyristors can be turned off using a gate signal?**

- A) TRIAC
- B) DIAC
- C) GTO
- D) SCR

Correct: C

3491. **What happens if dv/dt across a thyristor exceeds its rating?**

- A) Thyristor turns off
- B) Thyristor turns on unintentionally

- C) Device fails instantly
- D) Device operates normally

Correct: B

3492. **The main function of a heat sink in thyristor circuits is to:**

- A) Reduce conduction losses
- B) Control gate signal
- C) Dissipate heat
- D) Limit voltage

Correct: C

3493. **Gate characteristics of SCR relate gate current with:**

- A) Anode voltage
- B) Cathode voltage
- C) Gate voltage
- D) Anode current

Correct: C

3494. **TRIACs are triggered by:**

- A) Gate current only in positive cycle
- B) Voltage across main terminals
- C) Gate current in either polarity
- D) Reverse voltage

Correct: C

3495. **Which triggering method uses a pulse transformer?**

- A) Capacitive triggering
- B) Optical triggering
- C) Pulse triggering
- D) DC triggering

Correct: C

3496. **During reverse blocking mode, SCR behaves like a:**

- A) Short circuit
- B) Open circuit
- C) Diode
- D) Zener

Correct: B

3497. **What controls the output of a phase-controlled rectifier?**

- A) Load resistance
- B) Firing angle
- C) Output current
- D) Input frequency

Correct: B

3498. **The turn-on time of an SCR depends on:**

- A) Gate width
- B) Gate power
- C) Gate current
- D) All of the above

Correct: D

3499. **Thyristor protection circuits include:**

- A) Filters
- B) RC snubber
- C) EMI suppressor
- D) Rectifiers

Correct: B

3500. **An SCR conducts when:**

- A) Gate is positive and anode is positive
- B) Gate is negative
- C) Anode is negative
- D) Gate is open

Correct: A

3501. **The SCR characteristic curve is plotted between:**

- A) Voltage and frequency
- B) Current and voltage
- C) Gate voltage and resistance
- D) Current and power

Correct: B

3502. **Which device can control AC power in both directions?**

- A) SCR
- B) GTO
- C) TRIAC
- D) BJT

Correct: C

3503. **The gate power loss in SCRs is typically:**

- A) High
- B) Negligible
- C) Medium
- D) Depends on load

Correct: B

3504. **In SCR, breakover voltage is highest when:**

- A) Gate is shorted
- B) Gate is open
- C) Load is resistive
- D) Gate current is maximum

Correct: B

3505. **Commutation means:**

- A) Applying forward voltage
- B) Increasing gate pulse
- C) Turning off the thyristor
- D) Providing snubber

Correct: C

3506. **The holding current is always:**

- A) Higher than latching current
- B) Equal to latching current
- C) Lower than latching current

D) Irrelevant in SCRs

Correct: C

3507. **The main function of the gate in SCR is to:**

- A) Switch off device
- B) Trigger device
- C) Control voltage
- D) Reduce current

Correct: B

3508. **The load current in a controlled rectifier depends on:**

- A) Anode voltage only
- B) Supply frequency
- C) Load impedance and firing angle
- D) Commutation method

Correct: C

3509. **A high-frequency thyristor trigger circuit often uses:**

- A) Relay
- B) Pulse transformer
- C) Inductor
- D) Thermistor

Correct: B

3510. **Thyristor can be triggered by:**

- A) Gate voltage
- B) Heat
- C) Light
- D) All of the above

Correct: D

3511. **For AC voltage control using thyristor, which is most suitable?**

- A) Chopper
- B) Inverter
- C) TRIAC
- D) Diode

Correct: C

3512. **The value of latching current is typically:**

- A) 10x holding current
- B) Equal to gate current
- C) Slightly higher than holding current
- D) Zero

Correct: C

3513. **Which of the following is not a type of commutation?**

- A) Natural
- B) Forced
- C) Resonant
- D) Synchronous

Correct: D

3514. **The number of PN junctions in an SCR is:**

- A) 1
- B) 2
- C) 3
- D) 4

Correct: C

3515. **A TRIAC can be triggered in:**

- A) Only one quadrant
- B) Two quadrants
- C) Three quadrants
- D) All four quadrants

Correct: D

3516. **In SCR, latching current is the minimum current required to:**

- A) Turn off the device
- B) Keep the device off
- C) Maintain conduction after gate signal is removed
- D) Reverse the current flow

Correct: C

3517. **Which device is most suitable for switching high current loads in AC circuits?**

- A) BJT
- B) TRIAC
- C) MOSFET
- D) UJT

Correct: B

3518. **During the off-state of an SCR, the current flowing is called:**

- A) Latching current
- B) Holding current
- C) Leakage current
- D) Triggering current

Correct: C

3519. **The turn-off process in a thyristor is also known as:**

- A) Triggering
- B) Firing
- C) Commutation
- D) Conduction

Correct: C

3520. **Which thyristor family member can be turned off via gate signal?**

- A) GTO
- B) TRIAC
- C) SCR
- D) DIAC

Correct: A

3521. **A light-triggered thyristor is known as:**

- A) LASCR
- B) DIAC
- C) TRIAC

D) Opto-isolator

Correct: A

3522. **Which SCR parameter must be exceeded to cause unintentional turn-on?**

A) Latching current

B) Holding current

C) dv/dt

D) Peak current

Correct: C

3523. **TRIACs can be triggered by applying gate current in:**

A) Only one polarity

B) Positive polarity only

C) Negative polarity only

D) Either polarity

Correct: D

3524. **Which component is commonly used to suppress high dv/dt in thyristor circuits?**

A) Capacitor

B) Fuse

C) Resistor

D) RC Snubber

Correct: D

3525. **Which thyristor has symmetrical V-I characteristics?**

A) SCR

B) TRIAC

C) DIAC

D) GTO

Correct: B

3526. **In a TRIAC, MT1 and MT2 refer to:**

A) Gate terminals

B) Main terminals

C) Trigger terminals

D) Transformer taps

Correct: B

3527. **The gate current required for triggering is usually:**

A) AC

B) DC

C) High-frequency

D) Reverse-polarity

Correct: B

3528. **The breakover voltage of an SCR decreases when:**

A) Gate current increases

B) Gate current decreases

C) Anode voltage increases

D) Anode current increases

Correct: A

3529. **The purpose of DIAC in triggering circuit is to:**

A) Block gate current

- B) Limit gate voltage
 - C) Provide symmetrical switching
 - D) Reduce frequency
- Correct: C**

3530. **TRIAC can be used for:**

- A) Only DC circuits
 - B) Both AC and DC
 - C) Only AC circuits
 - D) High-frequency circuits
- Correct: C**

3531. **Which of the following is a unidirectional device?**

- A) TRIAC
 - B) DIAC
 - C) SCR
 - D) GTO
- Correct: C**

3532. **A DIAC conducts when the applied voltage exceeds:**

- A) Forward breakover voltage
 - B) Reverse voltage
 - C) Breakover voltage in either direction
 - D) Holding current
- Correct: C**

3533. **In a resistive load, current and voltage are:**

- A) Out of phase
 - B) In phase
 - C) Opposite in direction
 - D) Zero
- Correct: B**

3534. **Which device is best suited for AC light dimmer control?**

- A) SCR
 - B) DIAC
 - C) TRIAC
 - D) BJT
- Correct: C**

3535. **Triggering angle control in TRIAC circuits is achieved using:**

- A) Transformer
 - B) RC Network
 - C) Inductor
 - D) Heat sink
- Correct: B**

3536. **Gate triggering circuit using UJT is preferred because:**

- A) UJT is cheap
 - B) UJT is a switching device
 - C) UJT provides sharp pulse
 - D) UJT is linear
- Correct: C**

3537. **The main terminals of a TRIAC are labeled as:**

- A) Emitter and collector
- B) Source and drain
- C) MT1 and MT2
- D) Anode and cathode

Correct: C

3538. **Which parameter ensures safe operation of SCR under high frequency?**

- A) di/dt rating
- B) dv/dt rating
- C) Gate current
- D) Forward voltage

Correct: A

3539. **In a single-phase full converter, the average output voltage is zero when firing angle is:**

- A) 0°
- B) 90°
- C) 120°
- D) 180°

Correct: B

3540. **Which of the following is a natural commutation method?**

- A) Class A
- B) Class B
- C) Class C
- D) Class E

Correct: A

3541. **In power electronics, SCR is mostly used as a:**

- A) Signal amplifier
- B) Current booster
- C) Controlled rectifier
- D) Transistor substitute

Correct: C

3542. **Which of the following is not a thyristor family device?**

- A) GTO
- B) TRIAC
- C) DIAC
- D) BJT

Correct: D

3543. **The average power output of a controlled rectifier increases with:**

- A) Increasing load
- B) Increasing firing angle
- C) Decreasing firing angle
- D) Constant frequency

Correct: C

3544. **GTO requires what type of gate pulse to turn off?**

- A) Positive
- B) AC

- C) Negative
- D) Pulsed DC

Correct: C

3545. **In phase angle control of SCR, power is controlled by:**

- A) Varying frequency
- B) Varying gate voltage
- C) Varying firing angle
- D) Changing load resistance

Correct: C

3546. **Turn-off time in an SCR is measured in:**

- A) Seconds
- B) Milliseconds
- C) Microseconds
- D) Nanoseconds

Correct: C

3547. **Thyristor ratings are usually given for:**

- A) DC only
- B) AC only
- C) Both AC and DC
- D) Variable frequency

Correct: C

3548. **In a full converter, the output voltage is negative when firing angle is:**

- A) $>90^\circ$
- B) $=90^\circ$
- C) $<90^\circ$
- D) $=0^\circ$

Correct: A

3549. **dv/dt effect can be minimized using:**

- A) Heat sink
- B) RC snubber
- C) Inductor
- D) Pulse transformer

Correct: B

3550. **Class B commutation is also called:**

- A) Voltage commutation
- B) Current commutation
- C) Load commutation
- D) Resonant commutation

Correct: A

3551. **TRIAC replaces:**

- A) Two SCRs in antiparallel
- B) One BJT
- C) Two BJTs
- D) One MOSFET

Correct: A

3552. Which device is turned on by gate current and turned off by load current?

- A) SCR
- B) TRIAC
- C) GTO
- D) DIAC

Correct: A

3553. To isolate control and power circuits, which device is used?

- A) GTO
- B) UJT
- C) Opto-coupler
- D) TRIAC

Correct: C

3554. In Class C commutation, the commutation is achieved using:

- A) Load
- B) Capacitor and SCR
- C) Transformer
- D) Freewheeling diode

Correct: B

3555. Which device can be used for zero-crossing detection in SCR firing?

- A) UJT
- B) DIAC
- C) Opto-isolator
- D) Zero-crossing detector

Correct: D

3556. The conduction angle in a controlled rectifier is:

- A) 360°
- B) 180°
- C) $(180^\circ - \alpha)$
- D) $(180^\circ + \alpha)$

Correct: C

3557. In dual converters, the control technique used is:

- A) Voltage commutation
- B) Complementary firing
- C) Series resonance
- D) Zero-voltage switching

Correct: B

3558. A GTO can be used in:

- A) Low power AC drives
- B) High power DC drives
- C) Communication systems
- D) Audio amplifiers

Correct: B

3559. In half-wave rectifier using SCR, output frequency is:

- A) Same as input
- B) Double the input
- C) Half the input

D) Zero

Correct: A

3560. **A commutation circuit is used to:**

- A) Trigger SCR
- B) Turn off SCR
- C) Protect from overvoltage
- D) Amplify signal

Correct: B

3561. **Reverse blocking capability is essential in:**

- A) TRIAC
- B) GTO
- C) SCR
- D) DIAC

Correct: C

3562. **The junction temperature of a thyristor should be:**

- A) As high as possible
- B) Very low
- C) Within rated limits
- D) Equal to room temperature

Correct: C

3563. **A thyristor is in forward blocking mode when:**

- A) Gate is triggered
- B) Anode is positive, no gate signal
- C) Anode is negative
- D) Holding current flows

3564. **In a TRIAC, conduction begins when:**

- A) Anode voltage exceeds gate voltage
- B) Gate signal is applied
- C) Main terminal 1 is positive
- D) Capacitor is charged

Correct: B

3565. **The latching current of an SCR is typically:**

- A) Higher than holding current
- B) Lower than holding current
- C) Equal to holding current
- D) Equal to gate current

Correct: A

3566. **Which one is not a turn-off method of SCR?**

- A) Forced commutation
- B) Natural commutation
- C) Gate commutation
- D) Line commutation

Correct: C

3567. **The turn-on time of an SCR is in the range of:**

- A) 1-5 seconds

- B) 1-10 ms
 - C) 1-10 μ s
 - D) 1-10 ns
- Correct: C**

3568. **What is the function of a snubber circuit?**

- A) Amplification
- B) Noise generation
- C) dv/dt protection
- D) Boosting power

Correct: C

3569. **The phase control method in thyristors is based on varying the:**

- A) Load resistance
- B) Frequency
- C) Firing angle
- D) Supply voltage

Correct: C

3570. **Which device is turned off when anode current < holding current?**

- A) GTO
- B) TRIAC
- C) SCR
- D) All of the above

Correct: D

3571. **Which type of load is most critical for SCR commutation?**

- A) Resistive
- B) Capacitive
- C) Inductive
- D) Linear

Correct: C

3572. **TRIAC triggering uses a DIAC to:**

- A) Delay conduction
- B) Provide pulse shaping
- C) Provide symmetrical triggering
- D) Increase power

Correct: C

3573. **In AC circuits, SCR commutation is simpler because of:**

- A) Constant voltage
- B) Voltage zero-crossing
- C) Current spikes
- D) High power

Correct: B

3574. **GTO is most suitable for:**

- A) Small signal amplification
- B) Low power switching
- C) High power, high voltage applications
- D) Oscillator circuits

Correct: C

3575. **Thyristor protection circuits are necessary to prevent failure due to:**

- A) Overvoltage
- B) Overcurrent
- C) Excessive dv/dt and di/dt
- D) All of the above

Correct: D

3576. **Which is used for triggering a high-power SCR?**

- A) Capacitor
- B) Transformer
- C) Pulse transformer
- D) DIAC

Correct: C

3577. **The forward current rating of a thyristor refers to:**

- A) Peak gate current
- B) Peak anode current
- C) Maximum safe operating current
- D) Reverse leakage current

Correct: C

3578. **Which of these is not part of an SCR structure?**

- A) P-layer
- B) N-layer
- C) Gate junction
- D) Collector

Correct: D

3579. **SCR commutation is the process of:**

- A) Latching the device
- B) Triggering it
- C) Turning it off
- D) Turning it on

Correct: C

3580. **Which thyristor is most suitable for high-speed switching?**

- A) TRIAC
- B) LASCR
- C) GTO
- D) SCR

Correct: C

3581. **A dual converter consists of:**

- A) Two TRIACs
- B) Two GTOs
- C) Two full converters in anti-parallel
- D) A full and half converter

Correct: C

3582. **Which is used to sense zero-crossing for firing SCRs?**

- A) RC snubber
- B) Opto-isolator
- C) Zero crossing detector

D) Diode bridge

Correct: C

3583. **A freewheeling diode is used in:**

A) Capacitive load

B) Pure resistive load

C) Inductive load

D) Constant power load

Correct: C

3584. **In forced commutation, thyristor is turned off by:**

A) Reducing gate current

B) Forcing reverse current

C) Triggering DIAC

D) Reducing voltage

Correct: B

3585. **Which of the following is a disadvantage of SCRs?**

A) High speed

B) Inability to turn off by gate

C) Bidirectional conduction

D) High efficiency

Correct: B

3586. **The most important characteristic of a power thyristor is:**

A) Low gain

B) Triggering time

C) High power handling

D) Small size

Correct: C

3587. **Which is the most common method to trigger an SCR?**

A) Light triggering

B) dv/dt triggering

C) Gate triggering

D) Voltage triggering

Correct: C

3588. **LASCR is a thyristor that is:**

A) Gate-controlled

B) Light-activated

C) Logic-controlled

D) Line-commutated

Correct: B

3589. **The gate current required for firing an SCR is typically in the range of:**

A) Nanoamperes

B) Microamperes

C) Milliamperes

D) Amperes

Correct: C

3590. **Which thyristor-based device is commonly used in power control of domestic appliances?**

- A) DIAC
- B) TRIAC
- C) GTO
- D) LASCR

Correct: B

3591. **Gate triggering is not required in SCR if:**

- A) It is used in a chopper
- B) Forward breakover voltage is exceeded
- C) Load is capacitive
- D) dv/dt is high

Correct: B

3592. **SCRs used in AC voltage regulators control:**

- A) RMS value of voltage
- B) Frequency
- C) Current
- D) Load resistance

Correct: A

3593. **The gate cathode junction of SCR is always:**

- A) Forward biased during conduction
- B) Reverse biased during conduction
- C) Reverse biased during triggering
- D) Forward biased in reverse blocking

Correct: A

3594. **Thyristors are not preferred in:**

- A) Relay control
- B) Frequency control
- C) Power switching
- D) Controlled rectifiers

Correct: B

3595. **An SCR remains on as long as the anode current is:**

- A) Less than holding current
- B) More than latching current
- C) Greater than holding current
- D) Less than gate current

Correct: C

3596. **TRIAC is equivalent to:**

- A) Two SCRs in series
- B) Two SCRs in parallel
- C) Two SCRs in anti-parallel
- D) One SCR and one BJT

Correct: C

3597. **The SCR must be triggered into conduction in which region?**

- A) Reverse blocking
- B) Forward blocking
- C) Conduction region

D) Cut-off
Correct: B

3598. **Which device offers symmetrical bidirectional control with a gate?**

- A) SCR
- B) GTO
- C) TRIAC
- D) DIAC

Correct: C

3599. **To ensure proper turn-off, an SCR must be:**

- A) Heated
- B) Reverse biased
- C) Forward biased
- D) Gate pulsed

Correct: B

3600. **Which of the following can protect thyristors from surge currents?**

- A) RC snubber
- B) Pulse transformer
- C) Series inductor
- D) Fuse

Correct: D

3601. **Which is a characteristic of SCR in the on-state?**

- A) Acts as open switch
- B) Low voltage drop
- C) High resistance
- D) Reverse biased gate

Correct: B

3602. **Which of the following is a major application of thyristors?**

- A) Logic gates
- B) Voltage clamping
- C) Phase control
- D) Audio signal filtering

Correct: C

3603. **Commutation circuits are used in:**

- A) UJTs
- B) BJTs
- C) SCRs
- D) DIACs

Correct: C

3604. **The turn-off process of a GTO requires:**

- A) High voltage
- B) Negative gate current
- C) Reverse polarity supply
- D) High-frequency pulses

Correct: B

3605. **The process of applying gate signal in synchronism with AC supply is called:**

- A) Phase synchronization

- B) Natural firing
- C) Synchronous triggering
- D) Load commutation

Correct: C

3606. **A TRIAC remains on until:**

- A) Gate signal is removed
- B) Voltage drops
- C) Current through it drops below holding current
- D) Phase angle resets

Correct: C

3607. **The maximum repetitive reverse voltage in an SCR is termed:**

- A) VRRM
- B) VBO
- C) VBR
- D) VDRM

Correct: D

3608. **In a single-phase full converter, the firing angle can vary between:**

- A) 0° to 90°
- B) 0° to 180°
- C) 90° to 180°
- D) 180° to 360°

Correct: B

3609. **Which device is known as a bidirectional trigger diode?**

- A) DIAC
- B) TRIAC
- C) SCR
- D) LASCR

Correct: A

3610. **An SCR is turned on by:**

- A) Applying voltage across anode and cathode only
- B) Applying gate current with forward anode voltage
- C) Applying reverse voltage
- D) Heating the device

Correct: B

3611. **Holding current in SCR is:**

- A) Minimum anode current to keep SCR ON
- B) Maximum current before damage
- C) Gate current level
- D) Leakage current

Correct: A

3612. **Which thyristor device can be switched off by applying a negative gate current?**

- A) SCR
- B) GTO
- C) TRIAC
- D) DIAC

Correct: B

3613. **The forward blocking voltage in an SCR is also called:**

- A) Peak reverse voltage
- B) Peak forward voltage
- C) Breakover voltage
- D) Holding voltage

Correct: C

c) Block Schematic of Closed Loop Control System in measuring and boring station

3614. What is the primary function of a closed-loop control system in a boring station?

- A) Ensure tool rotation
- B) Automatically adjust boring depth based on measurement feedback
- C) Control coolant flow
- D) Generate CAD designs

Correct Answer: B

3615. The **setpoint** in a boring station control system refers to:

- A) Actual position of the tool
- B) Desired depth or dimension
- C) Motor RPM
- D) Vibration threshold

Correct Answer: B

3616. The **feedback device** in a measuring and boring station typically includes:

- A) Laser sensor
- B) LVDT (Linear Variable Differential Transformer)
- C) Encoder
- D) All of the above

Correct Answer: D

3617. The **controller** in a closed-loop boring station performs:

- A) Data logging
- B) Comparison of setpoint and measured value to generate control signal
- C) Safety diagnostics
- D) Tool sharpening

Correct Answer: B

3618. Which actuator is commonly used to move the boring tool in a closed-loop system?

- A) Stepper motor
- B) Servo motor
- C) Pneumatic piston
- D) All of the above

Correct Answer: D

3619. What is the role of the comparator in a closed-loop system?

- A) It stores programs
- B) It compares measured output to the reference
- C) It moves the cutting tool

D) It cools the spindle

Correct Answer: B

3620. In measuring stations, closed-loop control improves:

- A) Aesthetic finish only
- B) Dimensional accuracy and repeatability
- C) Tool wear rate
- D) Coolant flow

Correct Answer: B

3621. A feedback signal is essential in a closed-loop system to:

- A) Initiate emergency shutdown
- B) Monitor spindle temperature
- C) Ensure correction of tool position
- D) Synchronize lighting

Correct Answer: C

3622. Which type of feedback is most commonly used for tool position in CNC boring machines?

- A) Thermal feedback
- B) Visual feedback
- C) Encoder-based feedback
- D) Manual measurement

Correct Answer: C

3623. The actuator responds to:

- A) Operator input
- B) Control signal from controller
- C) Tool temperature
- D) Material hardness

Correct Answer: B

3624. Closed-loop control is **preferable** over open-loop in boring stations because:

- A) It is cheaper
- B) It allows automatic tool wear compensation
- C) It is easier to program
- D) It uses fewer components

Correct Answer: B

3625. Tool offset errors can be minimized in a closed-loop system using:

- A) Manual gauge blocks
- B) Real-time sensor correction
- C) Blueprint checks
- D) None of the above

Correct Answer: B

3626. In a CNC boring station, backlash errors are compensated by:

- A) Encoder feedback and software correction
- B) Operator estimation
- C) Extra feed pressure

D) Slower cutting speed

Correct Answer: A

3627. The purpose of the measurement unit in the system is to:

- A) Cut material
- B) Display machine status
- C) Provide real-time feedback to the controller
- D) Store tools

Correct Answer: C

3628. Closed-loop control systems improve surface finish by:

- A) Controlling tool vibration
- B) Reducing operator error
- C) Adjusting feed rate dynamically
- D) All of the above

Correct Answer: D

3629. A high-resolution **linear encoder** in the measuring station measures:

- A) RPM
- B) Spindle torque
- C) Tool displacement
- D) Machine temperature

Correct Answer: C

3630. Which part of the control system interprets and applies correction signals?

- A) Sensor
- B) Actuator
- C) Controller
- D) Comparator

Correct Answer: C

3631. Deadband in a closed-loop system refers to:

- A) The temperature range of stability
- B) Range within which no control action occurs
- C) A safety buffer
- D) Memory allocation

Correct Answer: B

3632. In closed-loop boring systems, tool deflection compensation is handled by:

- A) Sensors and feedback algorithms
- B) Operator intervention
- C) Lower spindle speeds
- D) Coolant adjustment

Correct Answer: A

3633. If the feedback signal indicates overcutting, the controller will:

- A) Increase tool speed
- B) Halt operation
- C) Reduce tool feed

D) Reverse spindle direction

Correct Answer: C

3634. Which signal initiates tool movement in a closed-loop boring station?

- A) Feedback signal
- B) Error signal from comparator
- C) Voltage signal from battery
- D) Coolant flow signal

Correct Answer: B

3635. The block diagram of a closed-loop system includes all EXCEPT:

- A) Actuator
- B) Controller
- C) Sensor
- D) Battery backup

Correct Answer: D

3636. Measured deviation from the setpoint is called:

- A) Hysteresis
- B) Offset
- C) Error signal
- D) Drift

Correct Answer: C

3637. Repeatability in a boring station refers to:

- A) Tool change frequency
- B) Ability to reach the same final position consistently
- C) Spindle restart time
- D) Power-on delay

Correct Answer: B

3638. Closed-loop control systems in boring machines enhance automation by:

- A) Eliminating manual measurement and adjustment
- B) Improving operator workload
- C) Reducing power consumption
- D) Increasing complexity

Correct Answer: A

d) Block Schematic of Pouring Systems

3639. What is the main objective of a pouring control system in casting?

- A) Improve mold temperature
- B) Control the flow of molten metal into the mold
- C) Reduce fuel consumption
- D) Shape the mold cavity

Correct Answer: B

3640. In a pouring control system, the **setpoint** typically refers to:

- A) Mold temperature
- B) Desired pouring rate or volume

- C) Ladle pressure
- D) Pouring gate size
- Correct Answer: B**

3641. The **sensor** in the pouring control block diagram measures:

- A) Ladle temperature
- B) Flow rate or weight of molten metal poured
- C) Air pressure
- D) Mold hardness
- Correct Answer: B**

3642. What component receives the feedback signal and makes decisions in the control system?

- A) Furnace
- B) Controller
- C) Thermocouple
- D) Ladle
- Correct Answer: B**

3643. The **actuator** in a pouring system commonly controls:

- A) Mold rotation
- B) Opening of the pouring nozzle or stopper rod
- C) Pouring basin temperature
- D) Mold cooling fans
- Correct Answer: B**

3644. The **feedback signal** in pouring control typically represents:

- A) Flow rate or poured weight
- B) Furnace power
- C) Mold temperature
- D) Ambient humidity
- Correct Answer: A**

3645. Closed-loop control in pouring ensures:

- A) Faster mold filling
- B) Manual control
- C) Consistent pouring volume and speed
- D) Larger molds
- Correct Answer: C**

3646. A **discrepancy between setpoint and feedback** generates:

- A) Load signal
- B) Process error
- C) Voltage spike
- D) Cooling time
- Correct Answer: B**

3647. The **output** of the controller is sent to the:

- A) Furnace
- B) Actuator
- C) Mold cavity

D) Flow sensor

Correct Answer: B

3648. Which sensor is commonly used in pouring control for weight measurement?

A) LVDT

B) Thermocouple

C) Load cell

D) Tachometer

Correct Answer: C

3649. The function of the **comparator** in a block schematic is to:

A) Mix molten metal

B) Compare setpoint and measured value

C) Display pouring temperature

D) Heat the ladle

Correct Answer: B

3650. A **ladle tilting mechanism** is controlled by:

A) Furnace operator

B) Actuator signal from the controller

C) Mold pressure

D) Manual lever

Correct Answer: B

3651. **Flow control valves** in pouring systems regulate:

A) Mold temperature

B) Volume of molten metal delivered

C) Water cooling rate

D) Air flow only

Correct Answer: B

3652. Why is **real-time feedback** essential in pouring control?

A) To detect cooling rate

B) To detect mold filling status and stop at the right time

C) To adjust lighting

D) To alert the operator of ambient noise

Correct Answer: B

3653. An **open-loop system** in pouring may lead to:

A) Precise control

B) Over-pouring or under-pouring

C) More feedback loops

D) PID control

Correct Answer: B

3654. A **servo motor** in the pouring system is used for:

A) Heating molten metal

B) Opening or tilting ladles precisely

C) Sensing the fill level

D) Filtering impurities

Correct Answer: B

3655. The control system helps reduce:

A) Tool wear

B) Pouring time

C) Material waste and spillage

D) Sand temperature

Correct Answer: C

3656. The **dead time** in a pouring system refers to:

A) Time between pouring and cooling

B) Delay between actuator command and molten metal flow

C) Mold life span

D) Thermal gradient measurement

Correct Answer: B

3657. The **primary disturbance** in pouring control is:

A) Furnace vibration

B) Inconsistent mold sizes

C) Variation in metal flow characteristics

D) Manual operator presence

Correct Answer: C

3658. What role does a **PLC (Programmable Logic Controller)** play in pouring systems?

A) Generates molten metal

B) Measures the mold weight

C) Executes control logic and signal processing

D) Opens furnace door

Correct Answer: C

3659. The **pouring stop point** is determined by:

A) Operator's judgment

B) Mold vibration sensor

C) Feedback reaching setpoint

D) Color sensor

Correct Answer: C

3660. **PID control** in pouring is used to:

A) Delay heating

B) Stabilize and fine-tune pouring rate and amount

C) Limit actuator range

D) Stop mold cooling

Correct Answer: B

3661. The **block schematic** of pouring control includes all EXCEPT:

A) Sensor

B) Controller

C) Foundry walls

D) Actuator

Correct Answer: C

3662. Which of the following improves pouring **repeatability**?

A) Manual timing

B) Feedback loop and automated controller

C) Pouring by operator feel

D) Mold preheating

Correct Answer: B

3663. A common **output variable** in pouring control is:

A) Air temperature

B) Ladle weight

C) Volume or weight of molten metal poured

D) Length of sprue

Correct Answer: C

e) Block Schematic of temperature control in wheel shop oil fired furnaces

3664. What is the main objective of a temperature control system in an oil-fired furnace in a wheel shop?

A) Maintain furnace humidity

B) Control temperature accurately for heat treatment

C) Reduce metal hardness

D) Increase oil viscosity

Correct Answer: B

3665. In the block schematic, the **setpoint** refers to:

A) The temperature of cooling air

B) The target furnace temperature

C) Oil level in the tank

D) The speed of the fan

Correct Answer: B

3666. Which device typically acts as the **sensor** in a temperature control system?

A) Pressure gauge

B) Flowmeter

C) Thermocouple or RTD

D) Ultrasonic transducer

Correct Answer: C

3667. The **controller** in the system processes:

A) Voltage readings

B) Error signal (difference between setpoint and actual temperature)

C) Oil flow

D) Fan speed only

Correct Answer: B

3668. What component receives the controller's output and adjusts the furnace conditions?

- A) Sensor
- B) Actuator (e.g., oil valve or burner modulator)
- C) Mold
- D) Thermometer

Correct Answer: B

3669. In oil-fired furnaces, the **actuator** commonly adjusts:

- A) Fuel oil flow and air supply to burners
- B) Mold shape
- C) Wheel casting pressure
- D) Coolant pump

Correct Answer: A

3670. The **feedback signal** in this system represents:

- A) Oil pressure
- B) Air speed
- C) Actual furnace temperature
- D) Wheel size

Correct Answer: C

3671. A **PID controller** is preferred in furnace systems because it:

- A) Cools the furnace faster
- B) Offers precise and stable temperature control
- C) Replaces thermocouples
- D) Increases oil consumption

Correct Answer: B

3672. The **process variable** in the temperature control block schematic is:

- A) Desired temperature
- B) Fan current
- C) Actual furnace temperature
- D) Operator input

Correct Answer: C

3673. What is the role of a **comparator** in a closed-loop temperature control system?

- A) Measures fuel level
- B) Compares setpoint with feedback temperature
- C) Filters air supply
- D) Switches off the burner

Correct Answer: B

3674. A **thermocouple** is best suited for furnace control because:

- A) It has low cost and fast response
- B) It needs no calibration
- C) It controls pressure
- D) It runs the actuator

Correct Answer: A

3675. The **output** of the controller is used to:

- A) Open the furnace door

- B) Adjust burner intensity or oil valve
- C) Increase wheel speed
- D) Reduce mold flow

Correct Answer: B

3676. **Disturbances** in the furnace control loop can be caused by:

- A) Fluctuating oil supply
- B) Ambient temperature changes
- C) Heat loss during door opening
- D) All of the above

Correct Answer: D

3677. The **input** to the control system in block schematic terms is:

- A) Power supply voltage
- B) Desired temperature (setpoint)
- C) Sensor calibration
- D) Furnace material type

Correct Answer: B

3678. In temperature control, the **dead time** refers to:

- A) Delay between turning off the fan and cooling
- B) Time between controller output and temperature response
- C) Sensor calibration time
- D) Burner ignition delay

Correct Answer: B

3679. In wheel shops, maintaining precise furnace temperature is critical for:

- A) Aesthetic finish of wheels
- B) Metallurgical properties and structural integrity
- C) Wheel diameter
- D) Noise control

Correct Answer: B

3680. The **actuator** can be:

- A) Modulating burner
- B) Servo-controlled oil valve
- C) Variable air damper
- D) All of the above

Correct Answer: D

3681. What type of control action may result in the system responding too quickly and overshooting?

- A) Integral only
- B) Proportional only
- C) Derivative only
- D) PID

Correct Answer: B

3682. In an oil-fired furnace, temperature control failure could lead to:

- A) Incomplete heat treatment
- B) Fuel wastage

- C) Component damage
- D) All of the above

Correct Answer: D

3683. **Closed-loop control** is preferred in furnace systems because:

- A) It is cheaper
- B) It eliminates the need for sensors
- C) It continuously adjusts to reach and maintain setpoint
- D) It allows manual override

Correct Answer: C

3684. A **burner control unit** in the actuator block regulates:

- A) Combustion air and fuel mixture
- B) Wheel speed
- C) Mold position
- D) Exhaust fan noise

Correct Answer: A

3685. A **digital temperature controller** typically uses:

- A) Bimetallic strip
- B) Relay logic
- C) Microprocessor-based logic
- D) Magnetic compass

Correct Answer: C

3686. The **output signal** from a PID controller could be:

- A) ON/OFF
- B) Analog (4–20 mA or 0–10 V)
- C) Binary
- D) None of the above

Correct Answer: B

3687. The **response time** of the control system affects:

- A) Visual appearance of wheels
- B) Furnace structure
- C) Accuracy of temperature control
- D) Fuel tank size

Correct Answer: C

3688. In modern wheel shops, temperature control systems are often integrated with:

- A) Conveyor belts
- B) SCADA or HMI systems for real-time monitoring
- C) Gear systems
- D) Water pumps

Correct Answer: B

f) Block schematic of closed loop control system - arc furnace electrode control

3689. In an Electric Arc Furnace (EAF), the primary function of the electrode control system is to:

- A) Maintain a constant arc length
- B) Regulate the furnace temperature
- C) Control the power supply voltage
- D) Monitor the gas emissions

Correct Answer: A

3690. Which component in the EAF electrode control system is responsible for adjusting the position of the electrodes?

- A) Hydraulic cylinder
- B) Servo valve
- C) Electrode arm
- D) All of the above

Correct Answer: D

3691. In the block diagram of an EAF electrode control system, the feedback signal typically comes from:

- A) Arc voltage sensor
- B) Electrode position sensor
- C) Arc current sensor
- D) All of the above

Correct Answer: D

3692. The controller in the EAF electrode control system compares the feedback signal with the:

- A) Setpoint
- B) Measured arc current
- C) Electrode wear rate
- D) Furnace temperature

Correct Answer: A

3693. Which of the following is NOT typically part of the closed-loop control system in an EAF?

- A) Electrode position system
- B) Arc impedance controller
- C) Electrode wear sensor
- D) Gas emission monitor

Correct Answer: D

3694. In the EAF electrode control system, the hydraulic system's role is to:

- A) Provide power to the servo valve
- B) Adjust the electrode position
- C) Control the arc current
- D) Monitor the furnace temperature

Correct Answer: B

3695. The purpose of the arc impedance controller in the EAF system is to:

- A) Maintain a constant arc length
- B) Adjust the electrode position based on arc voltage
- C) Regulate the furnace temperature
- D) Monitor the gas emissions

Correct Answer: B

3696. In a typical EAF electrode control system, the power supply is connected to:

- A) The electrode arms
- B) The arc voltage sensor
- C) The furnace transformer
- D) The servo valve

Correct Answer: C

3697. Which of the following is a key advantage of using a closed-loop control system in EAF electrode positioning?

- A) Improved energy efficiency
- B) Reduced electrode wear
- C) Enhanced arc stability
- D) All of the above

Correct Answer: D

3698. The feedback signal in the EAF electrode control system is typically obtained from:

- A) Arc voltage sensor
- B) Electrode position sensor
- C) Arc current sensor
- D) All of the above

Correct Answer: D

3699. Which of the following components is essential for energy storage and filtering in the EAF electrode control system?

- A) Capacitor
- B) Inductor
- C) Transformer
- D) Resistor

Correct Answer: A

3700. The controller in the EAF electrode control system typically uses which type of control strategy?

- A) Proportional-Integral-Derivative (PID)
- B) On/Off control
- C) Fuzzy logic control
- D) Model Predictive Control (MPC)

Correct Answer: A

3701. Which of the following sensors is used to measure the position of the electrodes in the EAF system?

- A) Linear variable differential transformer (LVDT)
- B) Rotary encoder
- C) Capacitive sensor
- D) All of the above

Correct Answer: D

3702. The arc voltage in the EAF electrode control system is typically measured using:

- A) Voltage divider
- B) Potential transformer
- C) Hall effect sensor
- D) Optical sensor

Correct Answer: B

3703. Which of the following is a common disturbance in the EAF electrode control system?

- A) Electrode wear
- B) Scrap composition variations
- C) Furnace slag formation
- D) All of the above

Correct Answer: D

3704. The primary purpose of the servo valve in the EAF electrode control system is to:

- A) Control the flow of hydraulic fluid to the electrode actuator
- B) Measure the electrode position
- C) Regulate the arc voltage
- D) Monitor the furnace temperature

Correct Answer: A

3705. Which of the following is a typical characteristic of the hydraulic system used in EAF electrode control?

- A) High response time
- B) Low power consumption
- C) High force output
- D) Low maintenance requirements

Correct Answer: C

3706. The arc impedance in the EAF electrode control system is calculated as:

- A) Arc voltage divided by arc current
- B) Arc current divided by arc voltage
- C) Arc power divided by arc voltage
- D) Arc voltage divided by arc power

Correct Answer: A

3707. Which of the following is a disadvantage of using a closed-loop control system in EAF electrode positioning?

- A) Increased system complexity
- B) Higher energy consumption
- C) Reduced control accuracy
- D) Increased electrode wear

Correct Answer: A

3708. The setpoint in the EAF electrode control system typically represents:

- A) Desired arc voltage
- B) Desired electrode position
- C) Desired arc current
- D) Desired furnace temperature

Correct Answer: B

3709. Which of the following is a key performance indicator for the EAF electrode control system?

- A) Arc stability
- B) Electrode wear rate
- C) Energy efficiency
- D) All of the above

Correct Answer: D

3710. The hydraulic actuator in the EAF electrode control system is typically powered by:

- A) Electric motor
- B) Pneumatic system
- C) Hydraulic pump
- D) Manual operation

Correct Answer: C

3711. Which of the following is a common method for controlling the arc length in the EAF electrode control system?

- A) Adjusting the electrode position
- B) Regulating the arc voltage
- C) Controlling the arc current
- D) All of the above

Correct Answer: D

3712. The closed-loop control system in the EAF electrode control typically operates in which mode?

- A) Open-loop mode
- B) Closed-loop mode
- C) Hybrid mode

D) Manual mode

Correct Answer: B

3713. Which of the following is a typical input to the EAF electrode control system?

A) Arc voltage

B) Electrode position

C) Arc current

D) All of the above

g) Block schematic of control in electrical furnaces of wheel unit

3714. The main purpose of the control system in an electric furnace for a wheel unit is to:

A) Control ambient temperature

B) Monitor wheel diameter

C) Maintain precise furnace temperature

D) Regulate furnace lighting

Correct Answer: C

3715. In the block schematic, the **controller** is responsible for:

A) Sensing the temperature

B) Generating error signal and controlling actuator

C) Heating the material

D) Cooling the furnace

Correct Answer: B

3716. The **actuator** in the furnace control system typically controls:

A) Furnace door

B) Heating element power supply

C) Wheel balancing system

D) Lubrication system

Correct Answer: B

3717. The **temperature sensor** in an electrical furnace is commonly a:

A) Thermistor

B) Thermocouple

C) Pressure gauge

D) Tachometer

Correct Answer: B

3718. What is the typical **control variable** in a furnace system?

A) Voltage

B) Current

C) Temperature

D) Wheel load

Correct Answer: C

3719. In the block diagram of the control system, the **feedback loop** helps to:

- A) Increase heating rate
- B) Maintain steady-state temperature
- C) Speed up cooling
- D) Load wheels

Correct Answer: B

3720. An **error signal** is generated when:

- A) Setpoint = Output
- B) Feedback = Noise
- C) Setpoint $\neq$ Feedback
- D) Sensor fails

Correct Answer: C

3721. What does the **setpoint** represent in furnace temperature control?

- A) Measured temperature
- B) Ambient temperature
- C) Desired temperature to maintain
- D) Cooling fan speed

Correct Answer: C

3722. A **PID controller** is often used because:

- A) It reduces noise
- B) It manages on/off switching
- C) It improves accuracy and stability
- D) It replaces thermocouples

Correct Answer: C

3723. The heating element in an electric furnace acts as the:

- A) Controller
- B) Actuator
- C) Feedback device
- D) Comparator

Correct Answer: B

3724. Which of the following is a common **disturbance** in a furnace control system?

- A) Variation in input material mass
- B) Setpoint change
- C) Thermocouple calibration
- D) Operator fatigue

Correct Answer: A

3725. In a wheel unit furnace, feedback signal is derived from:

- A) Heating coil
- B) Control relay
- C) Temperature sensor
- D) Furnace door sensor

Correct Answer: C

3726. Furnace overshoot occurs when:

- A) Temperature never reaches setpoint
- B) Temperature rises above setpoint before stabilizing
- C) Controller is inactive
- D) Sensor is disconnected

Correct Answer: B

3727. Why is **closed-loop control** preferred over open-loop in wheel unit furnaces?

- A) Cheaper to install
- B) No sensors required
- C) More precise temperature regulation
- D) Faster preheating

Correct Answer: C

3728. The block schematic of the furnace control system includes:

- A) Sensor, controller, actuator, furnace
- B) Furnace, thermometer, bulb
- C) Relay, door, gauge
- D) None of the above

Correct Answer: A

3729. Which component measures actual process value in the furnace?

- A) Controller
- B) Sensor
- C) Relay
- D) Power supply

Correct Answer: B

3730. In control systems, **stability** refers to:

- A) Time to reach setpoint
- B) Resistance to external disturbances
- C) Maintaining output without oscillation
- D) System cooling rate

Correct Answer: C

3731. The **final control element** in a furnace system is typically:

- A) Operator panel
- B) Heating element
- C) Thermostat
- D) Sensor

Correct Answer: B

3732. The process of adjusting controller parameters for optimal response is called:

- A) Looping
- B) Commissioning
- C) Tuning
- D) Resetting

Correct Answer: C

3733. In the context of wheel unit furnaces, a **programmable logic controller (PLC)** is used for:

- A) Manual control
- B) Real-time monitoring and control
- C) Fuel adjustment
- D) Power supply backup

Correct Answer: B

3734. What type of signal is usually sent from the temperature sensor to the controller?

- A) Digital frequency
- B) Analog voltage or current
- C) Binary pulse
- D) Mechanical vibration

Correct Answer: B

3735. If a wheel leaves the furnace too early due to system error, it's called:

- A) Overshoot
- B) Disturbance
- C) Undershoot or underheating
- D) Reset time

Correct Answer: C

3736. The role of **feedback** in furnace control is to:

- A) Interrupt the heating process
- B) Provide actual process status to controller
- C) Display temperature on screen
- D) Replace manual input

Correct Answer: B

3737. A **dead time** in furnace systems is defined as:

- A) Time for temperature to stabilize
- B) Delay between control action and process response
- C) Time to load wheels
- D) Sensor boot-up time

Correct Answer: B

3738. Why is temperature uniformity important in wheel unit furnace operations?

- A) Aesthetic reasons
- B) Furnace insulation
- C) Metallurgical properties and structural integrity of the wheel
- D) Electrical noise reduction

Correct Answer: C

h) Block schematic of programmable logic controllers

3739. What is the main function of a PLC in industrial automation?

- A) Store large databases
- B) Control and automate machinery based on logic
- C) Print output labels

D) Perform manual switching

Correct Answer: B

3740. The basic block diagram of a PLC includes:

A) Processor, memory, input/output modules, power supply

B) Sensor, actuator, printer, monitor

C) Fan, belt, motor, chain

D) Server, keyboard, mouse, screen

Correct Answer: A

3741. In a PLC, the **CPU** primarily:

A) Powers the sensors

B) Controls input voltage

C) Executes control program logic

D) Maintains temperature

Correct Answer: C

3742. The **input module** of a PLC:

A) Sends signals to sensors

B) Receives field signals from switches, sensors, etc.

C) Stores PLC software

D) Controls output relays

Correct Answer: B

3743. Which module in the PLC block schematic sends signals to actuators?

A) CPU

B) Input module

C) Output module

D) Power supply

Correct Answer: C

3744. The **power supply** in a PLC does what?

A) Stores program memory

B) Powers external motors

C) Provides operating voltage to internal PLC components

D) Controls analog I/O

Correct Answer: C

3745. In the PLC block schematic, the **memory unit** stores:

A) Network passwords

B) Control logic programs and data

C) Sensor wiring diagrams

D) Ladder diagrams on paper

Correct Answer: B

3746. PLCs are most commonly programmed using:

A) C++

B) Python

C) Ladder Logic

D) Java

Correct Answer: C

3747. A **digital input** module is used for:

- A) Analog sensors like temperature
- B) Discrete signals like ON/OFF from switches
- C) High-frequency signals
- D) Video input

Correct Answer: B

3748. In a PLC block schematic, **I/O modules** are considered:

- A) Power processing units
- B) Interfaces to the external world
- C) Internal buses
- D) Operating systems

Correct Answer: B

3749. The **scan cycle** of a PLC includes:

- A) Read inputs → Execute program → Update outputs
- B) Write outputs → Execute program → Read inputs
- C) Check power → Run fan → Log data
- D) Charge → Discharge → Reset

Correct Answer: A

3750. PLC output modules can be of which type?

- A) Only analog
- B) Only digital
- C) Digital or analog depending on need
- D) None of the above

Correct Answer: C

3751. In the PLC schematic, the **programming device** is used to:

- A) Provide cooling
- B) Interface human operator to the machine
- C) Write and load control logic into the PLC
- D) Create mechanical movement

Correct Answer: C

3752. Which of the following is **NOT** a part of a basic PLC block diagram?

- A) Input module
- B) Output module
- C) CPU
- D) Hard disk drive

Correct Answer: D

3753. What connects the CPU with input and output modules in a PLC?

- A) Data cable
- B) Serial ports
- C) System bus
- D) Antenna

Correct Answer: C

3754. Which memory type stores user-written PLC programs?

- A) ROM
- B) RAM
- C) EEPROM/Flash memory
- D) Cache

Correct Answer: C

3755. Analog input modules convert:

- A) Binary to decimal
- B) Digital to analog
- C) Voltage or current to digital values
- D) Mechanical force to motion

Correct Answer: C

3756. A relay-type output module is best suited for:

- A) High-speed motors
- B) Digital display only
- C) Switching AC/DC loads
- D) Sound alarms only

Correct Answer: C

3757. The ladder diagram used in PLC programming is similar to:

- A) Assembly language
- B) Electrical wiring diagrams
- C) Flowcharts
- D) Network topology

Correct Answer: B

3758. PLCs replace which of the following in older control systems?

- A) Manual logbooks
- B) Relay-based logic circuits
- C) Human workers
- D) Hydraulic systems

Correct Answer: B

3759. In a PLC block schematic, real-time status of inputs is stored in the:

- A) Output register
- B) Input image table
- C) Control bus
- D) ROM

Correct Answer: B

3760. PLCs can communicate with other devices using:

- A) Wi-Fi only
- B) SCADA, Modbus, Ethernet
- C) Smoke signals
- D) Morse code

Correct Answer: B

3761. The **watchdog timer** in a PLC ensures:

- A) System doesn't crash due to stuck scan cycle
- B) Operator can take breaks
- C) Input pulses are amplified
- D) Signals are filtered

Correct Answer: A

3762. Which of the following PLC types is best for small machines?

- A) Modular PLC
- B) Rack-mounted PLC
- C) Compact or fixed PLC
- D) Distributed PLC

Correct Answer: C

3763. What is the main advantage of using PLCs in industrial automation?

- A) Low electricity bill
- B) Quick hardware repair
- C) Flexible and programmable logic control
- D) Free software licenses

Correct Answer: C

i) Functions of components used in instrumentation wheel and axle unit, photocells, proximity switches, plugging switch, tacho generators, synchros etc, used in shops

3764. What is the main function of a photocell in an axle shop?

- a) Count pulses
- b) Detect axle/Wheel presence or position using light
- c) Generate torque
- d) Limit voltage

Answer: b)

3765. The type of photocell sensor used in Axle shop is?

- a) Diffuse
- b) Through-beam
- c) Retro-reflective
- d) Capacitive

Answer: c)

3766. In Axle shop Photoelectric sensors typically fails/ Sequence disturbs due to:

- a) Excess voltage
- b) Obstructed light path (dirt/oil)
- c) Rust
- d) Motor overload

Answer: b)

3767. Photocells are used in wheel conveyors ns to:

- a) Drill holes

- b) Provide braking
- c) Confirm Wheel positioning
- d) Polish axle ends

Answer: c) Confirm Wheel positioning

3768. The proximity switch operates by detecting changes in:

- a) Temperature
- b) Light
- c) Magnetic or electric field
- d) Humidity

Answer: c) Magnetic or electric field

3769. Which type of proximity switch is used to detect axles?

- a) Capacitive
- b) Inductive
- c) Optical
- d) Ultrasonic Answer: b)

3770. Proximity switches are mainly used in axle shop to:

- a) Cut metal
- b) Sense axle ends for limit or presence
- c) Perform ultrasonic testing
- d) Mix lubricants

Answer: b) Sense axle ends for limit or presence

3771. In Gantry Gripper used in 3rd line, Proximity Sensors are used to detect

- a) Axles Presence
- b) Closing
- c) Opening
- d) All of the above Answer: a)

3772. Plunger switches are used to Cup turning Lathes in Machine shop:

- a) Increase speed motor
- b) Reduce friction
- c) Stop motor by reverse torque
- d) Detect Home position or Over travel of Any Axis Answer: d)

3773. The typical issue with proximity switch is that

- a) Wrong detection due to metal dust
- b) Missing detection due to mis alignment
- c) Both A&B
- d) None of the above

Answer: c)

3774. What triggers a plunger switch?

- a) Mechanical push due to axis movement
- b) Phase loss
- c) Reversal of rotation
- d) Lubrication failure

Answer: a)

3775. Tacho generators are used for measuring:

- a) Voltage only
- b) Pressure
- c) Shaft speed (RPM)
- d) Vibration

Answer: c) Shaft speed (RPM)

3776. The output of a tacho generator is typically:

- a) AC current
- b) Constant voltage
- c) Voltage proportional to speed
- d) Digital pulses

Answer: c) Voltage proportional to speed

3777. In Wheel Borer, a tachogenerator helps in:

- a) Detecting temperature
- b) Monitoring tool wear
- c) Feedback for EBB Motor speed control
- d) Detecting crack length

Answer: c)

3778. encoders are used to:

- a) Generate heat
- b) Transmit angular position data
- c) Detect pressure
- d) Clean the shaft

Answer: b) Transmit angular position data

3779. Which application uses encoders in an axle shop?

- a) Positioning of Gantries via feedback
- b) Axle presence
- c) Speed boosting
- d) Displaying weight

Answer: a)

3780. Encoders convert:

- a) Pressure into electrical signals
- b) Angular position into electrical signals
- c) Light into heat
- d) Torque into voltage

Answer: b) Angular position into electrical signals

3781. Limit switches are typically used to:

- a) Limit air flow
- b) Detect end of motion/travel
- c) Check conductivity
- d) Count voltage spikes

Answer: b) Detect end of motion/travel

3782. In MPT Bridge Crane, limit switches prevent:

- a) Overheating
- b) Overtravel
- c) Lubrication
- d) Short-circuit

Answer: b)

3783. What is the output type of a mechanical limit switch?

- a) Analog current
- b) Relay contact open/close
- c) Voltage ramp
- d) RF signal

Answer: b) Relay contact open/close

3784. What does an encoder measure in an axle shop?

- a) Load
- b) Shaft rotation/distance
- c) Crack length
- d) Pressure

Answer: b) Shaft rotation/distance

3785. Rotary encoders give output in the form of:

- a) AC frequency
- b) Analog pulses
- c) Digital pulses per revolution
- d) Air pressure

Answer: c) Digital pulses per revolution

3786. In Wheel Borer Machine (SMTC) encoders is of __PPR:

- a) 2
- b) 20
- c) 200
- d) 2000

Answer: C

3787. Pressure switches are used to monitor:

- a) Axle weight
- b) Hydraulic or pneumatic pressure
- c) Electrical load
- d) Conveyor length

Answer: b) Hydraulic or pneumatic pressure

3788. What happens when pressure exceeds a set limit in a pressure switch?

- a) It changes color
- b) It trips the circuit or gives signal
- c) It vibrates
- d) It breaks

Answer: b) It trips the circuit or gives signal

3789. Which system uses pressure switches in axle shop?

- a) Lathes
- b) Hydraulic press
- c) Gantries
- d) All of the above

Answer: d

3790. A VFD receives feedback from which component to control motor speed?

- a) Pressure switch
- b) Tacho generator or encoder
- c) Limit switch
- d) Photocell

Answer: b) Tacho generator or encoder

3791. Which sensor is used for indexing axle on a pallet conveyor in Axle shop?

- a) Thermocouple
- b) Proximity Switch
- c) Load cell
- d) Encoder

Answer: b) Photocell

3792. In Rough turning lathes . to get position feed back for screw rods it is connected to

- a) Encoder
- b) Proximity switch
- c) Limit Switch
- d) Photocell

Answer: A

3793. Measuring station (SMTC) linear scale outputs are connected in PLC to

- a) Analog Input
- b) Analog Output
- c) High Speed Pulse counter
- d) Digital output

Answer: C

3794. Which sensor is used to detect tool lock/Unlock positions on turret in SPM?

- a) Pressure switch
- b) Encoder
- c) Photocell
- d) Proximity switch

Answer: d)

3795. In Grinding machine which component measures axle diameter continuously?

- a) Limit switch
- b) Unimar gauge
- c) Encoder
- d) Proximity switch

Answer: b)

3796. The Wheel Press Recorder (now used in SMTC) uses

- a) Pressure Transmitter for Pressure
- b) Linear Scale for Distance
- c) Both A&B
- D) Only A

Answer: C

3797. The Wheel Press Recorder (now used in SMTC) is based on

- a) PLC based measurement
- b) CNC System
- c) LabView based software used for measurement
- d) None of these

Answer C

3798. Stepper Motors are used in

- a) New Measuring Station (2019)
- b) Long Gantry Machine Shop-X Axis
- c) RHF -Hearth Rotation
- d) Crane -MH Motor

Answer A

3799. The device used for balancing grinding wheels and to reduce vibration during grinding in Grinding Machine is

- a) Wheel Balancer
- b) Ummar gauge
- c) Limit switch
- d) Photocell

Answer: a

3800. In SMTC Press, HT / LT displayed during pressing is based on the feedback from?

- a) Proximity switch
- b) Encoder
- c) Linear Scale
- d) Pressure Transmitter

Answer: d

3801. For detecting small cracks on axle surface in MPT Machine, which is used?

- a) Pressure switch
- b) Limit switch
- c) Magnetic Field
- d) Proximity switch

Answer B

3802. In Rough turning Machine B Shop, Gantry Position Feedback is using

- a) Encoder only
- b) Encoder with Cam operated switch additionally (for defined positions)
- c) Cam operated switch only
- d) Limit switch

Answer: b)

3803. Which system uses all: photocells, encoders, and pressure switches?

- a) Radial Scanning Machine
- b) Crack testing station
- c) Automated axle pressing & transfer system
- d) EOT Crane

Answer: c

Indian Electricity Rules, Acts, Standard Codes, Tariffs

3804. Which regulatory body in India is responsible for determining tariffs for inter-state electricity generation and transmission?

- (a) State Electricity Regulatory Commissions (SERCs)
- (b) Central Electricity Regulatory Commission (CERC)
- (c) Tariff Advisory Committee
- (d) Central Electricity Authority (CEA)

Ans: (b)

3805. What is the primary purpose of the Central Electricity Regulatory Commission (CERC)?

- (a) To regulate the production and distribution of electricity within states.
- (b) To regulate the tariff and conditions of supply of electricity between states.
- (c) To oversee the construction of power plants.
- (d) To regulate the consumption of electricity by industries.

Ans: (b)

3806. Which of the following is not a factor considered by CERC when determining electricity tariffs?

- (a) Generation costs
- (b) Transmission costs
- (c) Distribution costs
- (d) Consumer preferences for electricity sources

Ans: (d)

3807. What is a two-part tariff?

- (a) A tariff that charges a fixed rate per unit of electricity consumed, regardless of usage.
- (b) A tariff that includes a fixed charge for infrastructure and a variable charge based on actual energy usage.
- (c) A tariff that charges based on peak demand and total energy consumed.
- (d) A tariff that penalizes consumers for having a low power factor.

Ans: (b)

3808. Which of the following is not a component of Indian electricity tariffs?

- (a) Fixed Charges
- (b) Variable Charges
- (c) Energy Tax
- (d) Peak Demand Charges

Ans: (c)

3809. What is a two-part tariff?

- (a) A tariff that includes fixed and variable charges
- (b) A tariff that charges based on time of day
- (c) A tariff that charges based on power factor

(d) A tariff that charges based on energy efficiency

Ans: (a)

3810. Who is responsible for setting electricity tariffs in a state?

- (a) The Central Electricity Regulatory Commission
- (b) The Ministry of Power
- (c) The State Electricity Regulatory Commission
- (d) The DISCOM

Ans: (c)

3811. Which tariff structure incentivizes consumers to use electricity during off-peak hours by offering lower rates during those periods?

- (a) Simple tariff
- (b) Two-part tariff
- (c) Demand-based tariff
- (d) Time-of-use tariff

Ans: (d)

3812. Which tariff encourages consumers to manage their energy consumption during peak hours by charging for both the maximum demand and energy usage?

- (a) Simple tariff
- (b) Two-part tariff
- (c) Demand-based tariff
- (d) Time-of-use tariff

Ans: (c)

3813. Which tariff structure includes a fixed cost component, representing infrastructure, and a variable cost component, representing actual energy consumption?

- (a) Simple tariff
- (b) Two-part tariff
- (c) Demand-based tariff
- (d) Time-of-use tariff

Ans: (b)

3814. Which of the following tariffs charges the same rate per kWh, regardless of the amount of electricity used?

- (a) Simple tariff
- (b) Two-part tariff
- (c) Demand-based tariff
- (d) Time-of-use tariff

Ans: (a)

3815. ToD related to energy recording meter means

- (a) Time of Day
- (b) Tariff on Demand
- (c) Time of Demand
- (d) Tariff of Day

Ans: (a)

3816. The unit cost of solar energy procured from solar power developer at RWF is.....

- (a) Rs. 5.5
- (b) Rs. 4.95
- (c) Rs. 6.0
- (d) Rs. 6.50

Ans: (a)

3817. Penalty for low power factor is imposed on

- (a) Residential and commercial consumers
- (b) Industrial consumers
- (c) Agricultural consumers
- (d) All of above

Ans: (b)

3818. Monthly consumption of a consumer is 500KWh. What will be the monthly bill at the following rate?

First 100 unit Rs 0.6/KWh

Next 100 units Rs 0.5/KWh

Remaining units Rs 0.4/KWh

- (a) Rs 250
- (b) Rs 25
- (c) Rs 230
- (d) Rs 23

Ans: (c)

3819. The KWh energy supplied in a period divided by time period is known as _____?

- (a) Connected load
- (b) Maximum load
- (c) Average load
- (d) None of the above

Ans: (c)

3820. Tariff defines the rate at which ----- is supplied to consumer.

- (a) Power
- (b) Energy
- (c) Current
- (d) Voltage

Ans: (b)

3821. Variation between actual energy consumption and scheduled energy are accounted through which charges as per CERC regulations?

- (a) Unscheduled Interchange (UI) charges
- (b) Energy charges
- (c) Capacity charges
- (d) None of the above

Ans: (a)

3822. Under which IE rule all electric supply lines and apparatus must have sufficient rating for power, insulation, and mechanical strength?

- (a) Rule 29
- (b) Rule 31
- (c) Rule 35
- (d) Rule 45

Ans: (a)

3823. Which IE rule specifies that an independent cut-out must be provided for each consumer if multiple consumers are supplied through a common service line?

- (a) Rule 30
- (b) Rule 31
- (c) Rule 32
- (d) Rule 35

Ans: (b)

3824. According to IE Rule 33, where should the supplier provide an earthed terminal on a consumer's premises?

- (a) Near the electricity meter
- (b) Near the main circuit breaker
- (c) Near the point of commencement of supply
- (d) At the transformer

Ans: (c)

3825. What does IE Rule 35 of the Indian Electricity Rules, 1956, mandate for medium, high, and extra-high voltage installations?

- (a) Use of insulated wiring
- (b) Installation of transformers
- (c) Display of danger notice
- (d) Provision of emergency power backup

Ans: (c)

3826. IE Rule 44 mandates that instructions for treating electrical shock victims should be affixed in which languages?

- (a) English and Hindi only
- (b) Local language only
- (c) English, Hindi, and local language
- (d) Hindi and regional language

Ans: (c)

3827. Under IE Rule 45, who must follow electrical safety precautions?

- (a) Consumers
- (b) Electrical contractors
- (c) Workmen and suppliers
- (d) All of the above

Ans: (d)

3828. As per IE Rule 54, wWhat is the maximum allowable variation in declared voltage for high voltage supply under Rule 54?

- (a) $\pm 5\%$
- (b) $+6\%$ to -9%
- (c) $\pm 10\%$
- (d) $+9\%$ to -6%

Ans: (b)

3829. According to IE Rule 56, who is allowed to break the seal of an electrical meter?

- (a) The consumer
- (b) The electrical contractor
- (c) Only the supplier
- (d) The wireman

Ans: (c)

3830. As per IE Rule, What is the minimum vertical clearance required for high voltage lines above 11,000V passing above a building?

- (a) 2.5 meters
- (b) 3.7 meters
- (c) 4.6 meters
- (d) 5.2 meters

Ans: (b)

3831. What is the minimum horizontal clearance required for extra-high voltage (EHV) lines above 33,000V passing near a building?

- (a) 1.2 meters
- (b) 2.0 meters
- (c) 2.3 meters
- (d) 2.0 meters plus 0.3 meters for every additional 33,000Volts or part thereof.

Ans: (d)

3832. As per IE Rule, the person breaking the seal shall be punishable with fine which may extend to

- (a) Rs. 50
- (b) Rs. 100
- (c) Rs. 200
- (d) Rs. 500

Ans: (c)

3833. Which IE rule states that electrical accidents must be reported within 24 hours to the Inspector?

- (a) Rule 33

- (b) Rule 44A
- (c) Rule 55
- (d) Rule 77

Ans: (b)

3834. What is the minimum clearance for low voltage overhead lines erected across a street?

- (a) 3.5 meters
- (b) 4.6 meters
- (c) 5.8 meters
- (d) 6.1 meters

Ans: (c)

3835. According to Rule 76, what is the minimum factor of safety for hand-molded concrete supports?

- (a) 1.5
- (b) 2.0
- (c) 2.5
- (d) 3.0

Ans: (c)

3836. How many earth connections are required for the motor frame as per the IE rule 61?

- (a) One
- (b) Two separate and distinct
- (c) Three separate and distinct
- (d) All of these

Ans: (b)

3837. What is medium voltage, according to IE Rule 28?

- (a) Voltage that does not exceed 11000V under normal conditions
- (b) Voltage that does not exceed 440V under normal conditions
- (c) Voltage that does not exceed 650V under normal conditions
- (d) Voltage that does not exceed 22000V under normal conditions

Ans: (c)

3838. Which of the following Indian Electrical Rules describes about the periodical testing of consumer's installation?

- (a) Rule 56
- (b) Rule 46
- (c) Rule 54
- (d) Rule 31

Ans: (b)

3839. As per Indian electricity rule, gas pressure type protection to give alarm and tripping shall be provided on all high and extra-high voltage transformers of ratings and above.

- (a) 2 MVA
- (b) 500kVA
- (c) 10MVA

(d) 1000kVA

Ans: (d)

3840. When did The Electricity Act, 2003 come into force?

- (a) 01 April 2004
- (b) 01 March 2003
- (c) 10 June 2003
- (d) 23 April 2004

Ans: (c)

3841. Which section of The Electricity Act, 2003 deals with the Captive generation?

- (a) Section 12
- (b) Section 9
- (c) Section 14
- (d) Section 20

Ans: (b)

3842. Which section of The Electricity Act, 2003 deals with Conditions of licence?

- (a) Section 16
- (b) Section 14
- (c) Section 13
- (d) Section 18

Ans: (a)

3843. Section 25 of The Electricity Act, 2003 deals with -----?

- (a) National Load Despatch Centre
- (b) Inter-State, regional and inter-regional transmission
- (c) State Transmission Utility and functions.
- (d) Power to recover charges

Ans: (b)

3844. Vesting of utility in purchaser is provided in section ----- of The Electricity Act 2003.

- (a) Section 24
- (b) Section 22
- (c) Section 21
- (d) Section 23

Ans: (c)

3845. Section 42 of The Electricity Act, 2003 provides -----?

- (a) Duties of distribution licensee and open access
- (b) Charges for intervening transmission facilities
- (c) Power to recover charges
- (d) Power to require security

Ans: (a)

3846. Which section of The Electricity Act, 2003 deals with National policy on electrification and local distribution in rural areas?

- (a) Section 7

- (b) Section 4
- (c) Section 5
- (d) Section 9

Ans: (c)

3847. Section 12 of The Electricity Act, 2003 deals with -----?

- (a) Authorised persons to transmit, supply, etc., electricity
- (b) Procedure for grant of licence
- (c) Revocation of licence
- (d) Other business of transmission licensee

Ans: (a)

3848. Which section of The Electricity Act, 2003 deals with the Agreements with respect to supply or purchase of electricity?

- (a) Section 47
- (b) Section 49
- (c) Section 44
- (d) Section 45

Ans: (b)

3849. Section 10 of The Electricity Act, 2003 deals with -----?

- (a) Conditions of licence
- (b) Generating company and requirement for setting up of generating station
- (c) Duties of generating companies
- (d) Control of transmission and use of electricity

Ans: (c)

3850. Which act is used to regulate the Indian power sector today?

- (a) Indian Electricity Act 1910
- (b) Indian Electricity Act 1948
- (c) Indian Electricity Act 2000
- (d) Indian Electricity Act 2003

Ans: (d)

3851. The Non-discriminatory provision for the use of transmission lines or distribution system by any licensee or consumer or a person engaged in generation in accordance with the regulations specified by the Appropriate Commission is called

- (a) Scheduling
- (b) Trading
- (c) Open Access
- (d) Distribution

Ans: (c)

3852. Energy sources which are inexhaustible are known as

- (a) Commercial energy
- (b) Primary energy
- (c) Renewable energy
- (d) Secondary energy

Ans: (c)

3853. Which sections of the Electricity Act, 2003 deal with tariff?

- (a) Section 51 to 56
- (b) Section 61 to 66
- (c) Section 71 to 76
- (d) Section 81 to 86

Ans: (b)

THEORY AND PRACTICAL ASPECTS

a) Diesel Generator Sets

3854. What is the primary purpose of a Diesel Generator (DG) set in a Rail Wheel Factory (RWF)?

- A) To power the factory's lighting system
- B) To provide emergency backup power during grid failure
- C) To reduce energy consumption
- D) To cool down electrical equipment

Answer: B) To provide emergency backup power during grid failure

3855. Which protection device is commonly used to prevent overcurrent in the DG set circuit?

- A) Earth Fault Relay
- B) Overcurrent Relay
- C) Differential Protection Relay
- D) Under-voltage Relay

Answer: B) Overcurrent Relay

3856. What is the function of the overload relay in a DG set?

- A) To regulate the voltage
- B) To protect the generator from exceeding safe operating current limits
- C) To detect low fuel levels
- D) To control the engine speed

Answer: B) To protect the generator from exceeding safe operating current limit

3857. Which device is used for controlling the voltage output of a DG set?

- A) Voltage Regulator
- B) Earth Fault Relay
- C) Overcurrent Relay
- D) Surge Protector

Answer: A) Voltage Regulator

3858. What is the purpose of a coolant temperature sensor in a DG set?

- A) To monitor the fuel efficiency
- B) To prevent overheating by monitoring the engine coolant temperature
- C) To ensure smooth engine operation
- D) To regulate engine speed

Answer: B) To prevent overheating by monitoring the engine coolant temperature

3859. Which of the following is typically used to protect a DG set from short circuits?

- A) Earth Fault Relay
- B) Circuit Breaker
- C) Differential Protection
- D) Isolation Transformer

Answer: B) Circuit Breaker

3860. What is the purpose of a speed governor in a DG set?

- A) To maintain the engine speed at a constant level under varying load conditions
- B) To regulate the fuel flow to the engine
- C) To reduce emissions
- D) To monitor the exhaust gas temperature

Answer: A) To maintain the engine speed at a constant level under varying load conditions

3861. In a DG set, automatic voltage regulation (AVR) helps to:

- A) Automatically start the engine
- B) Regulate the generator's output voltage
- C) Control the fuel injectors
- D) Increase the engine power

Answer: B) Regulate the generator's output voltage

3862. What protection is typically used in DG sets to prevent overvoltage?

- A) Overcurrent Relay
- B) Overvoltage Relay
- C) Under-voltage Relay
- D) Low Power Factor Relay

Answer: B) Overvoltage Relay

3863. Which type of control system is commonly used to start and stop a DG set automatically based on power failure?

- A) Manual Control System
- B) Automatic Transfer Switch (ATS)
- C) PLC-based control system
- D) Local On/Off Switch

Answer: B) Automatic Transfer Switch (ATS)

3864. What is the role of the Automatic Transfer Switch (ATS) in DG set operation?

- A) To maintain constant power output
- B) To automatically switch between mains and DG set power during a power failure
- C) To control the fuel intake to the DG set
- D) To monitor exhaust emissions

Answer: B) To automatically switch between mains and DG set power during a power failure

3865. What is the function of a fuel level sensor in a DG set?

- A) To monitor fuel consumption
- B) To measure the fuel temperature

- C) To alert operators when the fuel tank is running low
- D) To control the fuel injection timing

Answer: C) To alert operators when the fuel tank is running low

3866. Which protection device is used to prevent low oil pressure in a DG set?

- A) Low Oil Pressure Switch
- B) Overcurrent Relay
- C) Voltage Regulator
- D) High Temperature Shutdown

Answer: A) Low Oil Pressure Switch

3867. What type of protection is used to prevent overheating of the DG engine?

- A) High Temperature Shutdown
- B) Voltage Regulator
- C) Load Shedding
- D) Overvoltage Relay

Answer: A) High Temperature Shutdown

3868. Which type of control system is responsible for regulating the speed of a DG engine?

- A) Fuel Flow Control
- B) Load Control System
- C) Speed Governor
- D) Voltage Regulation Control

Answer: C) Speed Governor

3869. In the context of a DG set, what does the term "load sharing" refer to?

- A) Balancing the load between the generator and the utility supply
- B) Distributing the power equally across multiple generators
- C) The process of controlling fuel consumption
- D) The regulation of the engine's cooling system

Answer: B) Distributing the power equally across multiple generators

3870. Which protection device is used to detect a phase failure in a DG set?

- A) Phase Failure Relay
- B) Overload Relay
- C) Low Voltage Relay
- D) Earth Fault Relay

Answer: A) Phase Failure Relay

3871. What is the function of a battery charger in a DG set?

- A) To charge the battery that powers the DG set's starting system
- B) To provide power to the control system
- C) To ensure voltage regulation
- D) To monitor the fuel level in the tank

Answer: A) To charge the battery that powers the DG set's starting system

3872. Which relay is used for earth fault protection in DG sets?

- A) Earth Fault Relay

- B) Overcurrent Relay
- C) Phase Sequence Relay
- D) Differential Protection Relay

Answer: A) Earth Fault Relay

3873. What is the key function of a cooling fan in a DG set?

- A) To increase fuel efficiency
- B) To cool the engine and prevent overheating
- C) To monitor the exhaust gases
- D) To supply air for combustion

Answer: B) To cool the engine and prevent overheating

3874. What type of protection would be used in a DG set to prevent dry running of the engine?

- A) Low fuel level alarm
- B) Low water level protection
- C) Low oil pressure switch
- D) Both B and C

Answer: D) Both B and C

3875. What is typically used to monitor the exhaust temperature of a DG set?

- A) Exhaust Gas Temperature Sensor
- B) Oil Pressure Switch
- C) Speed Governor
- D) Load Controller

Answer: A) Exhaust Gas Temperature Sensor

3876. In a DG set, automatic shutdown is triggered in case of:

- A) Low voltage output
- B) High temperature or low oil pressure
- C) Overload condition
- D) All of the above

Answer: D) All of the above

3877. What is the main purpose of Differential Protection in DG sets?

- A) To protect the engine from high temperatures
- B) To detect faults between phases or between phase and ground
- C) To maintain engine speed
- D) To regulate voltage output

Answer: B) To detect faults between phases or between phase and ground

3878. What kind of system is used for remote monitoring and control of DG sets?

- A) PLC-based control system
- B) Manual control system
- C) SCADA system
- D) Direct voltage control system

Answer: C) SCADA system

3879. Which of the following is NOT a feature of the Automatic Transfer Switch (ATS)?

- A) Automatic switching between DG set and utility supply
- B) Protection against electrical faults
- C) Control over the voltage regulation of the DG set
- D) Manual operation only

Answer: D) Manual operation only

3880. Which device is used to monitor the fuel consumption of a DG set?

- A) Fuel Gauge
- B) Load Bank
- C) Fuel Flow Meter
- D) Fuel Pressure Switch

Answer: C) Fuel Flow Meter

3881. Which of the following is part of the generator protection system for detecting faults?

- A) Generator Excitation System
- B) Generator Protection Relay
- C) Fuel Injection System
- D) Alternator Controller

Answer: B) Generator Protection Relay

3882. What type of protection device is used to prevent reverse power flow in DG sets?

- A) Reverse Power Relay
- B) Earth Fault Relay
- C) Overcurrent Relay
- D) Under-frequency Relay

Answer: A) Reverse Power Relay

3883. Which of the following is used for fuel system control in a DG set?

- A) Fuel Injection Pump
- B) Fuel Pressure Regulator
- C) Diesel Tank Valve
- D) All of the above

Answer: D) All of the above

3884. Which is not a common maintenance hazard with cranes

- A) Damage to wire rope
- B) Alignment Issues
- C) Bent/ damaged hooks
- D) Chipped Paint

Ans: D

3885. An overhead crane that consist of parallel runways with a travelling bridge is known as

- A) Road mobile Crane
- B) Monorail Crane
- C) Bridge crane
- D) Jib crane

Ans: C

3886. Type of crane where a horizontal beam extends to lift and move a load along the beam is known as

- A) Gantry Crane
- B) Monorail Crane
- C) Bridge crane
- D) Jib crane

Ans: D

3887. A crane that is shut down for various reasons should be

- A) Sold out
- B) Kept Open
- C) Locked out and tagged out
- D) Painted black

Ans: C

3888. Preventive maintenance is

- A) Maintenance carried out before an issue is identified
- B) Maintenance carried out after an issue is identified
- C) Maintenance carried out after an accident
- D) None of the above

Ans: A

3889. What is full form of L.T pertaining to EOT cranes?

- A) Limited travel
- B) Longitudinal travel
- C) Long travel
- D) Lengthy travel

Ans: B

3890. What is full form of C.T pertaining to EOT cranes?

- A) Complete travel
- B) Common travel
- C) Cross travel
- D) Close travel

Ans: C

3891. What is the full form of M.H pertaining to EOT cranes?

- A) Material Handling
- B) Mini Hoist
- C) Main Hoist
- D) Main Handle

Ans: C

3892. What is full form of A.H pertaining to EOT cranes?

- A) Additional Handle
- B) Auxiliary Hoist
- C) Additional Hoist

D) None of the above

Ans: B

3893. Hand signal during operations are used when

A) the operator is deaf

B) voice communications can not be heard

C) rigger is dumb

D) none of the above

Ans: B

3894. _____ is used to douse general fire

A) Fire extinguisher

B) Life guard

C) Alcohol

D) Air blowing

Ans: A

3895. Crane driver should accept emergency stop from

A) Only rigger engaged with his crane

B) all riggers at site

C) anybody working at site

D) Only his supervisor

Ans: C

3896. At a time crane driver should accept signals from

A) Only rigger engaged with his crane

B) all riggers at site

C) anybody working at site

D) Only his supervisor

Ans: A

3897. Total number of EOT cranes in the Axle Forge shop is

A) 2

B) 4

C) 5

D) 3

Ans: C

3898. Total number of EOT cranes in the Axle machine shop is

A) 2

B) 4

C) 3

D) 5

Ans: B

3899. Total number of EOT cranes in the Axle Assembly Bay is

A) 1

B) 2

C) 3

D) 4

Ans: D

3900. Total number of EOT cranes in the Wheelset loading Bay is

- A) 2
- B) 3
- C) 4
- D) 5

Ans: B

3901. Total number of EOT cranes in the SPC Bay is

- A) 2
- B) 3
- C) 4
- D) 5

Ans: C

3902. Axle Shop Control is carrying out the electrical maintenance activities of ____ number of cranes in RWF

- A) 13
- B) 16
- C) 20
- D) 21

Ans: C

3903. 10 Ton capacity crane is used in which area of the Axle shop?

- A) Forge Shop
- B) Machine Shop
- C) Assembly Shop
- D) None of the above

Ans: B

3904. All the Assembly shop cranes are of

- A) 10T
- B) 5T
- C) 15T
- D) 3T

Ans: B

3905. Capacity of Axle forge shop cranes is

- A) 5T
- B) 10T
- C) 15T
- D) 20T

Ans: C

3906. Maximum used Auxiliary hoist capacity of EOT cranes in Axle shop is

- A) 2T
- B) 3T
- C) 5T
- D) None of the above

Ans: D

3907. The safety devices of EOT cranes include

- A) Anti Collision device
- B) Rotary switches
- C) Over travel switches
- D) All of these

Ans: D

3908. How many corner switches will be there in an EOT crane in general

- A) 1
- B) 2
- C) 4
- D) 3

Ans: C

3909. If any of the corner switch is operated, then _____

- A) LT operation will be stopped
- B) CT operation will be stopped
- C) Hoist operation will be stopped
- D) All operations of the crane will be stopped

Ans: D

3910. The safety device which is used to limit the upward movement of the hoist operation is

- A) Rotary switch
- B) Gravity switch
- C) All of the above
- D) None of the above

Ans: C

3911. When the gravity switch is operated

- A) Hoist operation will be stopped
- B) All operations will be stopped
- C) LT operation will be stopped
- D) None of the above

Ans: B

3912. Which of the following act as a secondary safety device

- A) Gravity switch
- B) Rotary switch
- C) Over travel switches
- D) Corner switches

Ans: A

3913. All the safety devices of the EOT cranes are controlled by

- A) Protective panel
- B) Auxiliary Hoist panel
- C) Main Hoist panel
- D) Rectifier panel

Ans: A

3914. Rectangular magnet is used in

- A) Axle forge shop
- B) Machine shop
- C) Assembly shop
- D) None of these

Ans: A

3915. The capacity of rectangular magnets in the axle forge shop is

- A) 1kw
- B) 2kw
- C) 3kw
- D) 5kw

Ans: B

3916. Capacity of circular magnets in the SPC bay is

- A) 15kw
- B) 18.5kw
- C) 20kw
- D) 22.5kw

Ans: B

3917. Circular magnets are used for

- A) Lifting hot axles from the furnace discharge area
- B) Loading and unloading of blooms
- C) Both A and B
- D) Lifting of Scraps

Ans: D

3918. Rectangular magnets are used for

- A) Lifting hot axles from the furnace discharge area
- B) Loading and unloading of blooms
- C) Both A and B
- D) Lifting of Scraps

Ans: C

3919. Capacity of battery bank in the Forge shop cranes are

- A) 110V
- B) 220V
- C) 400V
- D) None of the above

Ans: A

3920. Capacity of battery bank in the SPC bay cranes are

- A) 110V
- B) 220V
- C) 400V
- D) None of the above

Ans: B

3921. Periodical maintenance of EOT cranes are carried out

- A) monthly
- B) quarterly
- C) half yearly
- D) All of the above

Ans: D

3922. Recommended duty cycle of motors used in the EOT cranes are

- A) S1
- B) S4
- C) Any of these
- D) None of these

Ans: B

3923. How many LT motors are there in each 15/2 T cranes of Axle shop?

- A) 1
- B) 2
- C) 3
- D) 4

Ans: D

3924. 41. How many LT motors are there in the 5T EOT cranes of Axle shop?

- A) 1
- B) 2
- C) 3
- D) 4

Ans: B

3925. What is the capacity of LT motors in the Forge shop EOT cranes?

- A) 5.5 kw
- B) 9.3kw
- C) 7.5kw
- D) 15kw

Ans: B

3926. What is the capacity of CT motors in the Forge shop EOT cranes?

- A) 5.5kw
- B) 9.3kw
- C) 7.5kw
- D) 15kw

Ans: A

3927. What is the full form of DSL in EOT cranes

- A) Duct system line
- B) Down supply lead
- C) Digital subscriber line
- D) Direct supply line

Ans: B

3928. Type of motor starter used in the EOT cranes is

- A) DOL
- B) Star delta
- C) VFD
- D) None of the above

Ans: VFD

3929. Full form of DBR in EOT cranes

- A) Dynamic braking recorder
- B) Drive braking resistance
- C) Diminishing brake resistance
- D) None of the above

Ans: B

3930. Panel used for charging of batteries of EOT crane is known as

- A) Magnet panel
- B) Hoist panel
- C) Rectifier panel
- D) Protective panel

Ans: C

3931. Full form of VFD is

- A) Voltage Frequency drive
- B) Variable frequency drive
- C) Variable fraction drive
- D) Voltage fixed drive

Ans: B

3932. Which of the following is a best practice for operating a crane?

- A) Conducting a pre shift inspection
- B) Speeding up operations to save time
- C) Ignoring hand signals if they seem unclear
- D) Operating the crane at the maximum capacity for efficiency

Ans: A

b) Transformers

3933. Which of the following does not change in a transformer ?

- (a) Current
- (b) Voltage
- (c) Frequency
- (d) All of the above

Answer: c

3934.2. In a transformer the energy is conveyed from primary to secondary

- (a) through cooling coil
- (b) through air

- (c) by the flux
- (d) none of the above

Answer: c

3935.3. A transformer core is laminated to

- (a) reduce hysteresis loss
- (b) reduce eddy current losses
- (c) reduce copper losses
- (d) reduce all above losses

Answer: b

3936.4. The degree of mechanical vibrations produced by the laminations of a transformer depends on

- (a) tightness of clamping
- (b) gauge of laminations
- (c) size of laminations
- (d) all of the above

Answer: d

3937.5. The no-load current drawn by transformer is usually what per cent of the full-load current ?

- (a) 0.2 to 0.5 per cent
- (b) 2 to 5 per cent
- (c) 12 to 15 per cent
- (d) 20 to 30 per cent

Answer: b

3938.6. The path of a magnetic flux in a transformer should have

- (a) high resistance
- (b) high reluctance
- (c) low resistance
- (d) low reluctance

Answer: d

3939.7. No-load on a transformer is carried out to determine

- (a) copper loss
- (b) magnetising current
- (c) magnetising current and loss
- (d) efficiency of the transformer

Answer: c

3940.8. The dielectric strength of transformer oil is expected to be

- (a) 1kV
- (b) 33 kV
- (c) 100 kV

(d) 330 kV

Answer: b

3941.9. Sumpner's test is conducted on trans-formers to determine

- (a) temperature
- (b) stray losses
- (c) all-day efficiency
- (d) none of the above

Answer: a

3942.10. The permissible flux density in case of cold rolled grain oriented steel is around

- (a) 1.7 Wb/m²
- (b) 2.7 Wb/m²
- (c) 3.7 Wb/m²
- (d) 4.7 Wb/m²

Answer: a

3943.11. The efficiency of a transformer will be maximum when

- (a) copper losses = hysteresis losses
- (b) hysteresis losses = eddy current losses
- (c) eddy current losses = copper losses
- (d) copper losses = iron losses

Answer: d

3944.12. No-load current in a transformer

- (a) lags behind the voltage by about 75°
- (b) leads the voltage by about 75°
- (c) lags behind the voltage by about 15°
- (d) leads the voltage by about 15°

Answer: a

3945.13. The purpose of providing an iron core in a transformer is to

- (a) provide support to windings
- (b) reduce hysteresis loss
- (c) decrease the reluctance of the magnetic path
- (d) reduce eddy current losses

Answer: c

3946.14. Which of the following is not a part of transformer installation ?

- (a) Conservator
- (b) Breather
- (c) Buchholz relay
- (d) Exciter

Answer: d

3947.15. While conducting short-circuit test on a transformer the following side is short circuited

- (a) High voltage side
- (b) Low voltage side
- (c) Primary side
- (d) Secondary side

Answer: b

3948.16. In the transformer following winding has got more cross-sectional area

- (a) Low voltage winding
- (b) High voltage winding
- (c) Primary winding
- (d) Secondary winding

Answer: a

3949.17. A transformer transforms

- (a) voltage
- (b) current
- (c) power
- (d) frequency

Answer: c

3950.18. A transformer cannot raise or lower the voltage of a D.C. supply because

- (a) there is no need to change the D.C. voltage
- (b) a D.C. circuit has more losses
- (c) Faraday's laws of electromagnetic induction are not valid since the rate of change of flux is zero
- (d) none of the above

Answer: c

3951.19. Primary winding of a transformer

- (a) is always a low voltage winding
- (b) is always a high voltage winding
- (c) could either be a low voltage or high voltage winding
- (d) none of the above

Answer: c

3952.20. Which winding in a transformer has more number of turns ?

- (a) Low voltage winding
- (b) High voltage winding
- (c) Primary winding
- (d) Secondary winding

Answer: b

3953.21. Efficiency of a power transformer is of the order of

- (a) 100 per cent

- (b) 98 per cent
- (c) 50 per cent
- (d) 25 per cent

Answer: b

3954.22. In a given transformer for given applied voltage, losses which remain constant irrespective of load changes are

- (a) friction and windage losses
- (b) copper losses
- (c) hysteresis and eddy current losses
- (d) none of the above

Answer: c

3955.23. A common method of cooling a power transformer is

- (a) natural air cooling
- (b) air blast cooling
- (c) oil cooling
- (d) any of the above

Answer: c

3956.24. The no load current in a transformer lags behind the applied voltage by an angle of about

- (a) 180°
- (b) 120°
- (c) 90°
- (d) 75°

Answer: d

3957.25. In a transformer routine efficiency depends upon

- (a) supply frequency
- (b) load current
- (c) power factor of load
- (d) both (b) and (c)

Answer: d

3958.26. In the transformer the function of a conservator is to

- (a) provide fresh air for cooling the transformer
- (b) supply cooling oil to transformer in time of need
- (c) protect the transformer from damage when oil expands due to heating
- (d) none of the above

Answer: c

3959.27. Natural oil cooling is used for transformers up to a rating of

- (a) 3000 kVA
- (b) 1000 kVA
- (c) 500 kVA

(d) 250 kVA

Answer: a

3960.28. Power transformers are designed to have maximum efficiency at

- (a) nearly full load
- (b) 70% full load
- (c) 50% full load
- (d) no load

Answer: a

3961.29. The maximum efficiency of a distribution transformer is

- (a) at no load
- (b) at 50% full load
- (c) at 80% full load
- (d) at full load

Answer: b

3962.30. Transformer breaths in when

- (a) load on it increases
- (b) load on it decreases
- (c) load remains constant
- (d) none of the above

Answer: b

3963.31. No-load current of a transformer has

- (a) has high magnitude and low power factor
- (b) has high magnitude and high power factor
- (c) has small magnitude and high power factor
- (d) has small magnitude and low power factor

Answer: d

3964.32. Spacers are provided between adjacent coils

- (a) to provide free passage to the cooling oil
- (b) to insulate the coils from each other
- (c) both (a) and (b)
- (d) none of the above

Answer: a

3965.33. Greater the secondary leakage flux

- (a) less will be the secondary induced e.m.f.
- (b) less will be the primary induced e.m.f.
- (c) less will be the primary terminal voltage
- (d) none of the above

Answer: a

3966.34. The purpose of providing iron core in a step-up transformer is

- (a) to provide coupling between primary and secondary
- (b) to increase the magnitude of mutual flux
- (c) to decrease the magnitude of magnetizing current
- (d) to provide all above features

Answer: c

3967.35. The power transformer is a constant

- (a) voltage device
- (b) current device
- (c) power device
- (d) main flux device

Answer: d

3968.36. Two transformers operating in parallel will share the load depending upon their

- (a) leakage reactance
- (b) per unit impedance
- (c) efficiencies
- (d) ratings

Answer: b

3969.37. If R_2 is the resistance of secondary winding of the transformer and K is the transformation ratio then the equivalent secondary resistance referred to primary will be

- (a) R_2/VK
- (b) R_2/K^2
- (c) R_2/K
- (d) R_2/K

Answer: b

3970.38. What will happen if the transformers working in parallel are not connected with regard to polarity ?

- (a) The power factor of the two transformers will be different from the power factor of common load
- (b) Incorrect polarity will result in dead short circuit
- (c) The transformers will not share load in proportion to their kVA ratings
- (d) none of the above

Answer: b

3971.39. If the percentage impedances of the two transformers working in parallel are different, then

- (a) transformers will be overheated
- (b) power factors of both the transformers will be same
- (c) parallel operation will be not possible
- (d) parallel operation will still be possible, but the power factors at which the

two transformers operate will be different from the power factor of the common load

Answer: d

3972.40. In a transformer the tapings are generally provided on

- (a) primary side
- (b) secondary side
- (c) low voltage side
- (d) high voltage side

Answer: c

3973.41. The use of higher flux density in the transformer design

- (a) reduces weight per kVA
- (b) reduces iron losses
- (c) reduces copper losses
- (d) increases part load efficiency

Answer: a

3974.42. The chemical used in breather for transformer should have the quality of

- (a) ionizing air
- (b) absorbing moisture
- (c) cleansing the transformer oil
- (d) cooling the transformer oil.

Answer: b

3975.43. The chemical used in breather is

- (a) asbestos fiber
- (b) silica sand
- (c) sodium chloride
- (d) silica gel

Answer: d

3976. An ideal transformer has infinite values of primary and secondary inductances. The statement is

- (a) true
- (b) false

Answer: b

3977.45. The transformer ratings are usually expressed in terms of

- (a) volts
- (b) amperes
- (c) kW
- (d) kVA

Answer: d

3978.46. The noise resulting from vibrations of laminations set by magnetic forces, is termed as

- (a) magnetostriction
- (b) boo
- (c) hum
- (d) zoom

Answer: c

3979.47. Hysteresis loss in a transformer varies as B_{max} = maximum flux density)

- (a) B_{max}
- (b) B_{max}^{1-6}
- (C) B_{max}^{1-83}
- (d) B_{max}

Answer: b

3980.48. Material used for construction of transformer core is usually

- (a) wood
- (b) copper
- (c) aluminium
- (d) silicon steel

Answer: d

3981.49. The thickness of laminations used in a transformer is usually

- (a) 0.4 mm to 0.5 mm
- (b) 4 mm to 5 mm
- (c) 14 mm to 15 mm
- (d) 25 mm to 40 mm

Answer: a

3982.50. The function of conservator in a transformer is

- (a) to project against internal fault
- (b) to reduce copper as well as core losses
- (c) to cool the transformer oil
- (d) to take care of the expansion and contraction of transformer oil due to variation of temperature of surroundings

Answer: d

3983.51. The highest voltage for transmitting electrical power in India is

- (a) 33 kV.
- (6) 66 kV
- (c) 132 kV
- (d) 400 kV

Answer: d

3984.52. In a transformer the resistance between its primary and secondary is

- (a) zero
- (b) 1 ohm
- (c) 1000 ohms
- (d) infinite

Answer: d

3985.53. A transformer oil must be free from

- (a) sludge
- (b) odour
- (c) gases
- (d) moisture

Answer: d

3986.54. A Buchholz relay can be installed on

- (a) auto-transformers
- (b) air-cooled transformers
- (c) welding transformers
- (d) oil cooled transformers

Answer: d

3987.55. Gas is usually not liberated due to dissociation of transformer oil unless the oil temperature exceeds

- (a) 50°C
- (b) 80°C
- (c) 100°C
- (d) 150°C

Answer: d

3988.56. The main reason for generation of harmonics in a transformer could be

- (a) fluctuating load
- (b) poor insulation
- (c) mechanical vibrations
- (d) saturation of core

Answer: d

3989.57. Distribution transformers are generally designed for maximum efficiency around

- (a) 90% load
- (b) zero load
- (c) 25% load
- (d) 50% load

Answer: d

3990.58. Which of the following property is not necessarily desirable in the material for the transformer core ?

- (a) Mechanical strength

- (6) Low hysteresis loss
- (c) High thermal conductivity
- (d) High permeability

Answer: c

3991.59. Star/star transformers work satisfactorily when

- (a) load is unbalanced only
- (b) load is balanced only
- (c) on balanced as well as unbalanced loads
- (d) none of the above

Answer: b

3992.60. Delta/star transformer works satisfactorily when

- (a) load is balanced only
- (b) load is unbalanced only
- (c) on balanced as well as unbalanced loads
- (d) none of the above

Answer: c

3993.61. Buchholz's relay gives warning and protection against

- (a) electrical fault inside the transformer itself
- (b) electrical fault outside the transformer in outgoing feeder
- (c) for both outside and inside faults
- (d) none of the above

Answer: a

3994.62. The magnetising current of a transformer is usually small because it has

- (a) small air gap
- (b) large leakage flux
- (c) laminated silicon steel core
- (d) fewer rotating parts

Answer: a

3995.63. Which of the following does not change in an ordinary transformer ?

- (a) Frequency
- (b) Voltage
- (c) Current
- (d) Any of the above

Answer: a

3996.64. Which of the following properties is not necessarily desirable for the material for transformer core ?

- (a) Low hysteresis loss
- (b) High permeability
- (c) High thermal conductivity

(d) Adequate mechanical strength

Answer: c

3997.65. The leakage flux in a transformer depends upon

- (a) load current
- (b) load current and voltage
- (c) load current, voltage and frequency
- (d) load current, voltage, frequency and power factor

Answer: a

3998.66. The path of the magnetic flux in transformer should have

- (a) high reluctance
- (b) low reactance
- (c) high resistance
- (d) low resistance

Answer: b

3999.67. Noise level test in a transformer is a

- (a) special test
- (b) routine test
- (c) type test
- (d) none of the above

Answer: c

4000.68. Which of the following is not a routine test on transformers ?

- (a) Core insulation voltage test
- (b) Impedance test
- (c) Radio interference test
- (d) Polarity test

Answer: c

4001.69. A transformer can have zero voltage regulation at

- (a) leading power factor
- (b) lagging power factor
- (c) unity power factor
- (d) zero power factor

Answer: a

4002.70. Helical coils can be used on

- (a) low voltage side of high kVA transformers
- (b) high frequency transformers
- (c) high voltage side of small capacity transformers
- (d) high voltage side of high kVA rating transformers

Answer: a

4003.71. **Harmonics in transformer result in**

- (a) increased core losses
- (b) increased I^2R losses
- (c) magnetic interference with communication circuits
- (d) all of the above

Answer: d

4004.72. **The core used in high frequency transformer is usually**

- (a) copper core
- (b) cast iron core
- (c) air core
- (d) mild steel core

Answer: c

4005.73. **The full-load copper loss of a transformer is 1600 W. At half-load, the copper loss will be**

- (a) 6400 W
- (b) 1600 W
- (c) 800 W
- (d) 400 W

Answer: d

4006.74. **The value of flux involved in the e.m.f. equation of a transformer is**

- (a) average value
- (b) r.m.s. value
- (c) maximum value
- (d) instantaneous value

Answer: c

4007.75. **Silicon steel used in laminations mainly reduces**

- (a) hysteresis loss
- (b) eddy current losses
- (c) copper losses
- (d) all of the above

Answer: a

4008.76. **Which winding of the transformer has less cross-sectional area ?**

- (a) Primary winding
- (b) Secondary winding
- (c) Low voltage winding
- (d) High voltage winding

Answer: d

4009.77. **Power transformers are generally designed to have maximum efficiency around**

- (a) no-load
- (b) half-load

- (c) near full-load
- (d) 10% overload

Answer: c

4010.78. Which of the following is the main advantage of an auto-transformer over a two winding transformer ?

- (a) Hysteresis losses are reduced
- (b) Saving in winding material
- (c) Copper losses are negligible
- (d) Eddy losses are totally eliminated

Answer: b

4011.79. During short circuit test iron losses are negligible because

- (a) the current on secondary side is negligible
- (b) the voltage on secondary side does not vary
- (c) the voltage applied on primary side is low
- (d) full-load current is not supplied to the transformer

Answer: c

4012.80. Two transformers are connected in parallel. These transformers do not have equal percentage impedance. This is likely to result in

- (a) short-circuiting of the secondaries
- (b) power factor of one of the transformers is leading while that of the other lagging
- (c) transformers having higher copper losses will have negligible core losses
- (d) loading of the transformers not in proportion to their kVA ratings

Answer: d

4013.81. The changes in volume of transformer cooling oil due to variation of atmospheric temperature during day and

night is taken care of by which part of transformer

- (a) Conservator
- (b) Breather
- (c) Bushings
- (d) Buchholz relay

Answer: a

4014.82. An ideal transformer is one which has

- (a) no losses and magnetic leakage
- (b) interleaved primary and secondary windings
- (c) a common core for its primary and secondary windings
- (d) core of stainless steel and winding of pure copper metal

Answer: a

4015.83. When a given transformer is run at its rated voltage but reduced frequency, its

- (a) flux density remains unaffected
- (b) iron losses are reduced
- (c) core flux density is reduced
- (d) core flux density is increased

Answer: d

4016.84. In an actual transformer the iron loss remains practically constant from no-load to full-load because

- (a) value of transformation ratio remains constant
- (b) permeability of transformer core remains constant
- (c) core flux remains practically constant
- (d) primary voltage remains constant

Answer: c

4017.85. An ideal transformer will have maximum efficiency at a load such that

- (a) copper loss = iron loss
- (b) copper loss < iron loss
- (c) copper loss > iron loss
- (d) none of the above

Answer: a

4018.86. If the supply frequency to the transformer is increased, the iron loss will

- (a) not change
- (b) decrease
- (c) increase
- (d) any of the above

Answer: c

4019.87. Negative voltage regulation is indicative that the load is

- (a) capacitive only
- (b) inductive only
- (c) inductive or resistive
- (d) none of the above

Answer: a

4020.88. Iron loss of a transformer can be measured by

- (a) low power factor wattmeter
- (b) unity power factor wattmeter
- (c) frequency meter
- (d) any type of wattmeter

Answer: a

4021.89. When secondary of a current transformer is open-circuited its iron core will be

- (a) hot because of heavy iron losses taking place in it due to high flux density
- (b) hot because primary will carry heavy current

- (c) cool as there is no secondary current
- (d) none of above will happen

Answer: a

4022.90. The transformer laminations are insulated from each other by

- (a) mica strip
- (b) thin coat of varnish
- (c) paper
- (d) any of the above

Answer: b

4023.91. Which type of winding is used in 3phase shell-type transformer ?

- (a) Circular type
- (b) Sandwich type
- (c) Cylindrical type
- (d) Rectangular type

Answer: b

4024.92. During open circuit test of a transformer

- (a) primary is supplied rated voltage
- (b) primary is supplied full-load current
- (c) primary is supplied current at reduced voltage
- (d) primary is supplied rated kVA

Answer: a

4025.93. Open circuit test on transformers is conducted to determine

- (a) hysteresis losses
- (b) copper losses
- (c) core losses
- (d) eddy current losses

Answer: c

4026.94. Short circuit test on transformers is conducted to determine

- (a) hysteresis losses
- (b) copper losses
- (c) core losses
- (d) eddy current losses

Answer: b

4027.95. For the parallel operation of single phase transformers it is necessary that they should have

- (a) same efficiency
- (b) same polarity
- (c) same kVA rating
- (d) same number of turns on the secondary side.

Answer: b

4028.96. The transformer oil should have _____ volatility and _____ viscosity.

- (a) low,low
- (b) high,high
- (c) low,high
- (d) high,low

Answer: a

4029.97. The function of breather in a transformer is

- (a) to provide oxygen inside the tank
- (b) to cool the coils during reduced load
- (c) to cool the transformer oil
- (d) to arrest flow of moisture when outside air enters the transformer

Answer: d

4030.98. The secondary winding of which of the following transformers is always kept closed ?

- (a) Step-up transformer
- (b) Step-down transformer
- (c) Potential transformer
- (d) Current transformer

Answer: d

4031.99. The size of a transformer core will depend on

- (a) frequency
- (b) area of the core
- (c) flux density of the core material
- (d) (a) and (b) both

Answer: d

4032.100. Natural air cooling is generally restricted for transformers up to

- (a) 1.5 MVA
- (b) 5 MVA
- (c) 15 MVA
- (d) 50 MVA

Answer: a

4033.101. A shell-type transformer has

- (a) high eddy current losses
- (b) reduced magnetic leakage
- (c) negligibly hysteresis losses
- (d) none of the above

Answer: b

4034.102. A transformer can have regulation closer to zero

- (a) on full-load
- (b) on overload

- (c) on leading power factor
- (d) on zero power factor

Answer: c

4035. A transformer transforms

- (a) voltage
- (b) current
- (c) current and voltage
- (d) power

Answer: d

4036. Which of the following is not the standard voltage for power supply in India ?

- (a) 11kV
- (b) 33kV
- (c) 66 kV
- (d) 122 kV

Answer: d

4037. Reduction in core losses and increase in permeability are obtained with transformer employing

- (a) core built-up of laminations of cold rolled grain oriented steel
- (b) core built-up of laminations of hot rolled sheet
- (c) either of the above
- (d) none of the above

Answer: a

4038. In a power or distribution transformer about 10 per cent end turns are heavily insulated

- (a) to withstand the high voltage drop due to line surge produced by the shunting capacitance of the end turns
- (b) to absorb the line surge voltage and save the winding of transformer from damage
- (c) to reflect the line surge and save the winding of a transformer from damage
- (d) none of the above

Answer: a

4039. For given applied voltage, with the increase in frequency of the applied voltage

- (a) eddy current loss will decrease
- (b) eddy current loss will increase
- (c) eddy current loss will remain unchanged
- (d) none of the above

Answer: c

4040. Losses which occur in rotating electric machines and do not occur in transformers are

- (a) friction and windage losses
- (b) magnetic losses
- (c) hysteresis and eddy current losses

(d) copper losses

Answer: a

4041. In a given transformer for a given applied voltage, losses which remain constant irrespective of load changes are

- (a) hysteresis and eddy current losses
- (b) friction and windage losses
- (c) copper losses
- (d) none of the above

Answer: a

4042. Which of the following statements regarding an ideal single-phase transformer having a turn ratio of 1 : 2 and drawing a current of 10 A from 200 V A.C. supply is incorrect ?

- (a) Its secondary current is 5 A
- (b) Its secondary voltage is 400 V
- (c) Its rating is 2 kVA
- (d) Its secondary current is 20 A
- (e) It is a step-up transformer

Answer: d

4043. The secondary of a current transformer is always short-circuited under operating conditions because it

- (a) avoids core saturation and high voltage induction
- (b) is safe to human beings
- (c) protects the primary circuit
- (d) none of the above

Answer: a

4044. In a transformer the resistance between its primary and secondary should be

- (a) zero
- (b) 10 Ω
- (c) 1000 Ω
- (d) infinity

Answer: d

4045. A good voltage regulation of a transformer means

- (a) output voltage fluctuation from no load to full load is least
- (b) output voltage fluctuation with power factor is least
- (c) difference between primary and secondary voltage is least
- (d) difference between primary and secondary voltage is maximum

Answer: a

4046. For a transformer, operating at constant load current, maximum efficiency will occur at

- (a) 0.8 leading power factor
- (b) 0.8 lagging power factor

- (c) zero power factor
- (d) unity power factor

Answer: d

4047. Which of the following protection is normally not provided on small distribution transformers ?

- (a) Overfluxing protection
- (b) Buchholz relay
- (c) Overcurrent protection
- (d) All of the above

Answer: b

4048. Which of the following acts as a protection against high voltage surges due to lightning and switching ?

- (a) Horn gaps
- (b) Thermal overload relays
- (c) Breather
- (d) Conservator

Answer: a

4049. The efficiency of two identical transformers under load conditions can be determined by

- (a) short-circuit test
- (b) back-to-back test
- (c) open circuit test
- (d) any of the above

Answer: b

4050. Which of the following insulating materials can withstand the highest temperature safely ?

- (a) Cellulose
- (b) Asbestos
- (c) Mica
- (d) Glass fibre

Answer: c

4051. Which of the following parts of a transformer is visible from outside ?

- (a) Bushings
- (b) Core
- (c) Primary winding
- (d) Secondary winding

Answer: a

4052. The noise produced by a transformer is termed as

- (a) zoom
- (b) hum

- (c) ringing
- (d) buzz

Answer: b

4053. Which of the following loss in a transformer is zero even at full load ?

- (a) Core loss
- (b) Friction loss
- (c) Eddy current loss
- (d) Hysteresis loss

Answer: b

4054. Which of the following is the most likely source of harmonics in a transformer ?

- (a) poor insulation
- (b) Overload
- (c) loose connections
- (d) Core saturation

Answer: d

4055. If a transformer is continuously operated the maximum temperature rise will occur in

- (a) core
- (b) windings
- (c) tank
- (d) any of the above

Answer: b

4056. The hum in a transformer is mainly attributed to

- (a) load changes
- (b) oil in the transformer
- (c) magnetostriction
- (d) mechanical vibrations

Answer: c

4057. The maximum load that a power transformer can carry is limited by its

- (a) temperature rise
- (b) dielectric strength of oil
- (c) voltage ratio
- (d) copper loss

Answer: c

4058. The efficiency of a transformer, under heavy loads, is comparatively low because

- (a) copper loss becomes high in proportion to the output
- (b) iron loss is increased considerably
- (c) voltage drop both in primary and secondary becomes large
- (d) secondary output is much less as compared to primary input

Answer: a

4059. An open-circuit test on a transformer is conducted primarily to measure

- (a) insulation resistance
- (b) copper loss
- (c) core loss
- (d) total loss
- (e) efficiency
- (f) none of the above

Answer: c

4060. A no-load test is performed on a transformer to determine

- (a) core loss
- (b) copper loss
- (c) efficiency
- (d) magnetising current
- (e) magnetising current and loss

Ans: e

4061. The voltage transformation ratio of a transformer is equal to the ratio of

- (a) primary turns to secondary turns
- (b) secondary current to primary current
- (c) secondary induced e.m.f. to primary induced e.m.f.
- (d) secondary terminal voltage to primary applied voltage

Answer: c

4062. Part of the transformer which is most subject to damage from overheating is

- (a) iron core
- (b) copper winding
- (c) winding insulation
- (d) frame or case
- (e) transformer tank

Answer: c

4063. 136. If a transformer is switched on to a voltage more than the rated voltage

- (a) its power factor will deteriorate
- (b) its power factor will increase
- (c) its power factor will remain unaffected
- (d) its power factor will be zero

Answer: a

4064. 137. Auto-transformer makes effective saving on copper and copper losses, when its transformation ratio is

- (a) approximately equal to one
- (b) less than one
- (c) great than one
- (d) none of the above

Answer: a

4065.138. Minimum voltage regulation occurs when the power factor of the load is

- (a) unity
- (b) lagging
- (c) leading
- (d) zero

Answer: c

4066.139. In a step-down transformer, there is a change of 15 A in the load current. This results in change of supply current of

- (a) less than 15 A
- (b) more than 15 A
- (c) 15 A
- (d) none of the above

Answer: a

4067.140. The efficiencies of transformers compared with that of electric motors of the same power are

- (a) about the same
- (b) much smaller
- (c) much higher
- (d) somewhat smaller
- (e) none of the above

Answer: c

c) HT and LT Control Gears and Protective Equipments

4068. Function of HT and LT Control Protective Equipment: What is the primary function of protective equipment in HT and LT circuits?

- a) To increase voltage
- b) To prevent overloading and short circuits
- c) To regulate current flow
- d) To step down the voltage

Answer: b) To prevent overloading and short circuits

4069. Which of the following devices is used to protect an electrical system from overcurrent?

- a) Circuit breaker
- b) Fuse
- c) Relay
- d) All of the above

Answer: d) All of the above

4070. In an LT control circuit, a thermal overload relay is used to:

- a) Protect against overvoltage
- b) Protect against short circuits
- c) Protect against overheating
- d) Measure current flow

Answer: c) Protect against overheating

4071. A voltage surge protector is used in HT and LT systems to:

- a) Prevent overcurrent
- b) Prevent voltage spikes
- c) Regulate current
- d) Increase efficiency

Answer: b) Prevent voltage spikes

4072. Which of the following devices is used to protect motors from short circuits and overloads?

- a) Fuse
- b) MCB (Miniature Circuit Breaker)
- c) MCCB (Molded Case Circuit Breaker)
- d) All of the above

Answer: d) All of the above

4073. The design of a circuit breaker is based on the principle of:

- a) Magnetic attraction
- b) Thermal expansion
- c) Both magnetic attraction and thermal expansion
- d) None of the above

Answer: c) Both magnetic attraction and thermal expansion

4074. The operating time of a fuse is determined by:

- a) The material of the fuse wire
- b) The current passing through the fuse
- c) The temperature of the fuse wire
- d) All of the above

Answer: d) All of the above

4075. In an HT system, the CT (Current Transformer) is used primarily for:

- a) Overload protection
- b) Voltage regulation
- c) Monitoring and measurement of current
- d) Control of fault currents

Answer: c) Monitoring and measurement of current

4076. The main components of an MCCB (Molded Case Circuit Breaker) include:

- a) Contacts, operating mechanism, and trip unit
- b) Only contacts and trip unit
- c) Only contacts and operating mechanism
- d) None of the above

Answer: a) Contacts, operating mechanism, and trip unit

4077. The RTU (Remote Terminal Unit) in an HT control system is used for:

- a) Monitoring and controlling equipment remotely
- b) Providing surge protection
- c) Overcurrent protection
- d) Protecting from short circuits

Answer: a) Monitoring and controlling equipment remotely

4078. The MCCB is constructed using:

- a) Plastic housing and metal contacts
- b) Wooden housing and copper contacts
- c) Ceramic housing and copper contacts
- d) Metal housing and rubber contacts

Answer: a) Plastic housing and metal contacts

4079. In HT protective equipment, the vacuum circuit breaker (VCB) uses a vacuum as the medium for:

- a) Current conduction
- b) Insulation
- c) Arc quenching
- d) Voltage regulation

Answer: c) Arc quenching

4080. The current transformer (CT) in HT equipment is typically made of:

- a) Copper
- b) Iron core with insulated wire wound around it
- c) Aluminum
- d) Plastic

Answer: b) Iron core with insulated wire wound around it

4081. Which type of protection device is used for earth fault protection in both HT and LT systems?

- a) Overload relay b) Earth leakage relay c) Overcurrent relay d) Differential relay

Answer: b) Earth leakage relay

4082. The fuse link in a fuse is typically made from:

- a) Aluminum b) Copper c) Silver d) Lead

Answer: b) Copper

4083. When installing a circuit breaker, what must be verified before use?

- a) The rated current and voltage levels b) The condition of the fuse
c) The ambient temperature around the equipment d) All of the above

Answer: d) All of the above

4084. For an LT control panel, which of the following should be ensured during installation?

- a) Proper earthing and grounding b) Correct sizing of protection devices
c) Ventilation for heat dissipation d) All of the above

Answer: d) All of the above

4085. When installing an HT transformer, what type of protection should be installed in the primary circuit?

- a) Surge protection b) Overload protection
c) Short circuit protection d) All of the above

Answer: d) All of the above

4086. Which type of control switch is commonly used in LT electrical distribution boards?

- a) Isolator b) Load break switch c) Push-button switch d) All of the above

Answer: d) All of the above

4087. When installing an earth leakage relay for protection, which is crucial to check?

- a) The sensitivity settings b) The grounding system
c) The time delay settings d) All of the above

Answer: d) All of the above

4088. What is the purpose of the time delay in overcurrent relays for HT systems?

- a) To prevent tripping during temporary overloads
b) To enhance the sensitivity
c) To reduce the possibility of nuisance tripping
d) Both a and c

Answer: d) Both a and c

4089. A thermal overload relay operates based on:

- a) The voltage level b) The current flowing through the circuit
c) The temperature of the equipment d) The mechanical motion of the switch

Answer: c) The temperature of the equipment

4090. In a fuse, when the current exceeds the rated value, it causes:

- a) The fuse link to heat up and melt
- b) The fuse link to compress
- c) A voltage spike
- d) No action

Answer: a) The fuse link to heat up and melt

4091. What does an MCCB do in the event of a short circuit?

- a) Automatically disconnects the circuit
- b) Prevents voltage from increasing
- c) Regulates current flow
- d) Increases the voltage to prevent damage

Answer: a) Automatically disconnects the circuit

4092. The earth leakage relay works by detecting:

- a) Current imbalance between the phase conductors
- b) Voltage fluctuations
- c) Overcurrent
- d) Frequency variation

Answer: a) Current imbalance between the phase conductors

4093. What is the main function of routine maintenance for circuit breakers?

- a) Ensuring that contacts are clean and not corroded
- b) Checking the insulation resistance
- c) Testing the trip settings and mechanism
- d) All of the above

Answer: d) All of the above

4094. How often should fuses be checked for wear and tear in LT systems?

- a) Annually
- b) Quarterly
- c) Every five years
- d) After every power outage

Answer: a) Annually

4095. In the maintenance of overload relays, what should be checked periodically?

- a) The coil resistance
- b) The tripping settings
- c) The condition of the contacts
- d) All of the above

Answer: d) All of the above

4096. What is typically done during the maintenance of earth leakage relays?

- a) Check for proper calibration and sensitivity
- b) Ensure the relay contacts are clean and functional
- c) Test the grounding system
- d) All of the above

Answer: d) All of the above

4097. In the maintenance of transformers, the oil level and condition should be checked:

- a) Annually
- b) Monthly
- c) Every 3 years
- d) Every 6 months

Answer: b) Monthly

4098. If a circuit breaker does not trip during a short circuit, what could be the problem?

- a) Faulty trip mechanism
- b) Incorrect current setting
- c) A blocked arc extinguisher
- d) All of the above

Answer: d) All of the above

4099. If the MCCB trips frequently, the issue might be:

- a) Overload condition
- b) Incorrect trip settings
- c) Fault in the circuit
- d) All of the above

Answer: d) All of the above

4100. If an earth leakage relay is not operating correctly, the problem could be:

- a) Incorrect trip setting
- b) Wiring issues
- c) A faulty relay
- d) All of the above

Answer: d) All of the above

4101. In case of overload protection failure, what should be checked first?

- a) The relay's sensitivity settings
- b) The condition of the protective device
- c) The wiring and connections
- d) All of the above

Answer: d) All of the above

4102. If a fuse blows, it could indicate:

- a) A short circuit
- b) An overload
- c) A fault in the equipment
- d) All of the above

Answer: d) All of the above

4103. When working with HT and LT protection equipment, safety gloves should be worn to:

- a) Prevent electric shock
- b) Protect from fire
- c) Ensure insulation from high voltages
- d) All of the above

Answer: d) All of the above

4104. Before maintaining a circuit breaker, it is crucial to:

- a) Disconnect the load
- b) Ensure the system is de-energized
- c) Use lockout/tagout procedures
- d) All of the above

Answer: d) All of the above

4105. What is the proper way to handle an earth fault?

- a) Immediate disconnection of the power supply
- b) Identifying and repairing the fault before reconnecting
- c) Checking the grounding system
- d) All of the above

Answer: d) All of the above

4106. In case of fire due to electrical faults in HT and LT equipment, the appropriate extinguisher is:

- a) Water-based extinguisher
- b) CO2 extinguisher
- c) Dry powder extinguisher
- d) Both b and c

Answer: d) Both b and c

4107. What should be done in case of an electrical shock from HT and LT equipment?

- a) Immediately disconnect the power supply
- b) Call emergency medical services
- c) Administer first aid if trained
- d) All of the above

Answer: d) All of the above

4108. Which type of protection device is commonly used in LT systems to protect against overload?

- a) Fuse b) MCB c) MCCB d) All of the above

Answer: d) All of the above

4109. Which type of circuit breaker is commonly used for HT applications?

- a) Air circuit breaker (ACB) b) Miniature circuit breaker (MCB)
c) Vacuum circuit breaker (VCB) d) All of the above

Answer: c) Vacuum circuit breaker (VCB)

4110. For high voltage applications, surge protectors are used to:

- a) Protect equipment from voltage spikes b) Regulate the voltage
c) Provide overload protection d) Measure current

Answer: a) Protect equipment from voltage spikes

4111. Which device is used for short-circuit protection in low voltage circuits?

- a) Fuse b) MCB c) MCCB d) All of the above

Answer: d) All of the above

4112. A current transformer (CT) is typically used for:

- a) Overcurrent protection b) Voltage regulation
c) Measuring and monitoring current d) Fault current detection

Answer: c) Measuring and monitoring current

4113. What is the main purpose of a transformer protection relay?

- a) To protect against overloading b) To protect against earth faults
c) To detect faults and trip the system d) All of the above

Answer: d) All of the above

4114. Which of the following is crucial for transformer maintenance?

- a) Monitoring oil temperature and level b) Regular testing of insulation resistance
c) Checking the cooling system d) All of the above

Answer: d) All of the above

4115. In case of a transformer fault, the protection system should immediately:

- a) Disconnect the transformer from the network b) Reset the transformer
c) Reduce the load d) None of the above

Answer: a) Disconnect the transformer from the network

4116. To prevent overheating of transformers, it is important to:

- a) Ensure proper ventilation b) Monitor oil temperature
c) Keep the load within the rated capacity d) All of the above

Answer: d) All of the above

4117. Which of the following is commonly used to detect an internal fault in a transformer?

- a) Buchholz relay b) Pressure relief valve
c) Oil temperature sensor d) All of the above

Answer: a) Buchholz relay

c) Batteries and Battery Charger

4118. The mass of an ion liberated at an electrode is directly proportional to the quantity of electricity".The above statement is associated with

- A. Newton's law
- B. Faraday's law of electromagnetic
- C. Faraday's law of electrolysis
- D. Gauss's law

Answer: C

4119. The charge required to liberate one gram equivalent of any substance is known as _____ constant

- A. time
- B. Faraday's
- C. Boltzman
- D. Gauss's

Answer: B

4120. During the charging of a lead-acid cell

- A. its voltage increases
- B. it gives out energy
- C. its cathode becomes dark chocolate brown in colour
- D. specific gravity of H_2SO_4 decreases

Answer: A

4121. The capacity of a lead-acid cell does not depend on its

- A. temperature
- B. rate of charge
- C. rate of discharge
- D. quantity of active material

Answer: B

4122. During charging the specific gravity of the electrolyte of a lead-acid battery

- A. increases
- B. decreases
- C. remains the same
- D. becomes zero

Answer: A

4123. The active materials on the positive and negative plates of a fully charged lead-acid battery are

- A. lead and lead peroxide
- B. lead sulphate and lead
- C. lead peroxide and lead
- D. none of the above

Answer: C

4124. When a lead-acid battery is in fully charged condition, the color of its positive plate is

- A. dark grey
- B. brown
- C. dark brown
- D. none of above

Answer: C

4125. The active materials of a nickel-iron battery are

- A. nickel hydroxide
- B. powdered iron and its oxide
- C. 21% solution of KOH
- D. all of the above

Answer: D

4126. The ratio of ampere-hour efficiency to watt-hour efficiency of a lead-acid cell is

- A. just one
- B. always greater than one
- C. always less than one
- D. none of the above.

Answer: B

4127. The best indication about the state of charge on a lead-acid battery is given by

- A. output voltage
- B. temperature of electrolyte
- C. specific gravity of electrolyte
- D. none of the above

Answer: C

4128. The storage battery generally used in electric power station is

- A. nickel-cadmium battery
- B. zinc-carbon battery
- C. lead-acid battery
- D. none of the above

Answer: C

4129. The output voltage of a charger is

- A. less than the battery voltage
- B. higher than the battery voltage
- C. the same as the battery voltage
- D. none of the above

Answer: B

4130. Cells are connected in series in order to

- A. increase the voltage rating
- B. increase the current rating
- C. increase the life of the cells
- D. none of the above

Answer: A

4131. Five 2 V cells are connected in parallel. The output voltage is

- A. 1 V
- B. 1.5 V
- C. 1.75 V
- D. 2 V

Answer: D

4132. The capacity of a battery is expressed in terms of

- A. current rating
- B. voltage rating
- C. ampere-hour rating
- D. none of the above

Answer: C

4133. During the charging and discharging of a nickel-iron cell

- A. corrosive fumes are produced
- B. water is neither formed nor absorbed
- C. nickel hydroxide remains unsplit
- D. its e.m.f. remains constant

Answer: B

4134. As compared to constant-current system, the constant-voltage system of charging a lead acid cell has the advantage of

- A. reducing time of charging
- B. increasing cell capacity
- C. both A and B
- D. avoiding excessive gassing

Answer: C

4135. A dead storage battery can be revived by

- A. adding distilled water
- B. adding so-called battery restorer
- C. a dose of H_2SO_4
- D. none of the above

Answer: D

4136. As compared to a lead-acid cell, the efficiency of a nickel-iron cell is less due to its

- A. compactness
- B. lower e.m.f.
- C. small quantity of electrolyte used
- D. higher internal resistance

Answer: D

4137. Trickle charging of a storage battery helps to

- A. maintain proper electrolyte level
- B. increase its reserve capacity
- C. prevent sulphation
- D. keep it fresh and fully charged

Answer: D

4138. Those substances of the cell which take active part in chemical combination and hence produce electricity during charging or discharging are known as _____ materials.

- A. passive
- B. active
- C. redundant
- D. inert

Answer: B

4139. In a lead-acid cell dilute sulfuric acid (electrolyte) approximately comprises the following

- A. one part H₂O, three parts H₂SO₄
- B. two parts H₂O, two parts H₂SO₄
- C. three parts H₂O, one part H₂SO₄
- D. all H₂SO₄

Answer: C

4140. It is noticed that during charging

- A. there is a rise in voltage
- B. energy is absorbed by the cell
- C. specific gravity of H₂SO₄ is increased
- D. all of the above

Answer: D

4141. It is noticed that during discharging the following does not happen

- A. both anode and cathode become PbSO₄
- B. specific gravity of H₂SO₄ decreases
- C. voltage of the cell decreases
- D. the cell absorbs energy

Answer: D

4142. The ampere-hour efficiency of a lead-acid cell is normally between

- A. 20 to 30%
- B. 40 to 50%
- C. 60 to 70%
- D. 90 to 95%

Answer: D

4143. The watt-hour efficiency of a lead-acid cell varies between

- A. 25 to 35%
- B. 40 to 60%
- C. 70 to 80%
- D. 90 to 95%

Answer: C

4144. The capacity of a lead-acid cell is measured in

- A. amperes
- B. ampere-hours
- C. watts
- D. watt-hours

Answer: B

4145. The capacity of a lead-acid cell depends on

- A. rate of discharge
- B. temperature
- C. density of electrolyte
- D. all above

Answer: D

4146. When the lead-acid cell is fully charged, the electrolyte assumes _____ appearance

- A. dull
- B. reddish
- C. bright
- D. milky

Answer: D

4147. The e.m.f. of an Edison cell, when fully charged, is nearly

- A. 1.4 V
- B. 1 V
- C. 0.9 V
- D. 0.8 V

Answer: A

4148. The internal resistance of an alkali cell is nearly _____ times that of the lead-acid cell.

- A. two
- B. three
- C. four
- D. five

Answer: D

4149. The average charging voltage for alkali cell is about

- A. 1 V
- B. 1.2 V
- C. 1.7 V
- D. 2.1 V

Answer: C

4150. On the average the ampere-hour efficiency of an Edison cell is about

- A. 40%
- B. 60%
- C. 70%
- D. 80%

Answer: D

4151. The active material of the positive plates of silver-zinc batteries is

- A. silver oxide
- B. lead oxide
- C. lead
- D. zinc powder

Answer: A

4152. Lead-acid cell has a life of nearly charges and discharges

- A. 500
- B. 700
- C. 1000
- D. 1250

Answer: D

4153. Life of the Edison cell is at least

- A. five years
- B. seven years
- C. eight years
- D. ten years

Answer: A

4154. The internal resistance of a lead-acid cell is that of Edison cell

- A. less than
- B. more than
- C. equal to
- D. none of the above

Answer: A

4155. Electrolyte used in an Edison cell is

- A. NaOH
- B. KOH
- C. HCl
- D. HNO₃

Answer: B

4156. Electrolyte used in a lead-acid cell is

- A. NaOH
- B. only H₂SO₄
- C. only water
- D. dilute H₂SO₄

Answer: D

4157. Negative plate of an Edison cell is made of

- A. copper
- B. lead
- C. iron
- D. silver oxide

Answer: C

4158. The open circuit voltage of any storage cell depends wholly upon

- A. its chemical constituents
- B. on the strength of its electrolyte
- C. its temperature
- D. all above

Answer: D

4159. The specific gravity of electrolyte is measured by

- A. manometer
- B. a mechanical gauge
- C. hydrometer
- D. psychrometer

Answer: C

4160. When the specific gravity of the electrolyte of a lead-acid cell is reduced to 1.1 to 1.15 the cell is in

- A. charged state
- B. discharged state
- C. both A. and B
- D. active state

Answer: B

4161. In _____ system the charging current is intermittently controlled at either a maximum or minimum value

- A. two rate charge control
- B. trickle charge
- C. floating charge
- D. an equalizing charge

Answer: A

4162. Over charging

- A. produces excessive gassing
- B. loosens the active material
- C. increases the temperature resulting in buckling of plates
- D. all above

Answer: D

4163. Undercharging

- A. reduces specific gravity of the electrolyte
- B. increases specific gravity of the electrolyte
- C. produces excessive gassing
- D. increases the temperature

Answer: A

4164. Internal short circuits are caused by

- A. breakdown of one or more separators
- B. excess accumulation of sediment at the bottom of the cell
- C. both A. and B
- D. none of the above

Answer: C

4165. The effect of sulphation is that the internal resistance

- A. increases
- B. decreases
- C. remains same
- D. none of the above

Answer: A

4166. Excessive formation of lead sulphate on the surface of the plates happens because of

- A. allowing a battery to stand in discharged condition for a long time
- B. topping up with electrolyte
- C. persistent undercharging
- D. low level of electrolyte

E. all above

Answer: E

4167. The substances which combine together to store electrical energy during the charge are called _____ materials

- A. active
- B. passive
- C. inert
- D. dielectric

Answer: A

4168. In a lead-acid cell, lead is called as

- A. positive active material
- B. negative active material
- C. passive material
- D. none of the above

Answer: B

4169. The lead-acid cell should never be discharged beyond

- A. 1.8 V
- B. 1.9 V
- C. 2 V
- D. 2.1 V

Answer: A

4170. On overcharging a battery

- A. it will bring about chemical change in active materials
- B. it will increase the capacity of the battery
- C. it will raise the specific gravity of the electrolyte
- D. none of the above will occur

Answer: D

4171. Each cell has a vent cap

- A. to allow gases out when the cell is on charge
- B. to add water to the cell if needed
- C. to check the level of electrolyte
- D. to do all above functions

Answer: D

4172. Following will occur if level of electrolyte falls below plates

- A. capacity of the cell is reduced
- B. life of the cell is reduced
- C. open plates are converted to lead sulphate
- D. all above

Answer: D

4173. In constant voltage charging method, the charging current from discharged to fully charged condition

- A. decreases
- B. increases
- C. remains constant
- D. none of the above

Answer: A

4174. ampere-hour capacity would deliver a current of

- A. 48 amperes for 1 hour
- B. 24 amperes for 2 hours
- C. 8 amperes for 6 hours
- D. 6 amperes for 8 hours

Answer: D

4175. In constant-current charging method, the supply voltage from discharged to fully charged condition

- A. decreases
- B. increases
- C. remains constant
- D. none of the above

Answer: B

4176. Battery charging equipment is generally installed

- A. in well ventilated location
- B. in clean and dry place
- C. as near as practical to the battery being charged
- D. in location having all above features

Answer: D

4177. Following will happen if the specific gravity of electrolyte becomes more than 1.23.

- A. Loss of capacity
- B. Loss of life
- C. Corrosion of the grids of the plate
- D. All above

Answer: D

4178. Batteries are charged by

- A. rectifiers
- B. engine generator sets
- C. motor generator sets
- D. any one of the above methods

Answer: D

4179. Cell short circuit results in

- A. low sp. gravity electrolyte
- B. abnormal high temperature
- C. reduced gassing on charge
- D. all above

Answer: D

4180. Internal resistance of a cell is reduced by

- A. using vent plug to permit gas formed during discharge
- B. increasing the plate area
- C. putting plates very close together
- D. all above methods

Answer: D

4181. Capacity of dry cells is

- A. more when it is supplying current for intermittent periods
- B. more when it is supplying current for continuous periods
- C. unaffected by the type of discharge
- D. none of the above

Answer: A

4182. Battery container should be acid resistance, therefore it is made up of

- A. glass
- B. plastic
- C. wood
- D. all above

Answer: D

4183. Sulphated cells are indicated by

- A. the loss of capacity of the cell
- B. the decrease of the specific gravity
- C. the low voltage of the cell on discharge
- D. all above conditions

Answer: D

4184. In a lead-acid cell, if the specific gravity of sulphuric acid is 1.8, it will require following ratio of acid to water to get mixture of specific gravity of 1.3

- A. 6 parts of acid to 4 parts of water
- B. 4 parts of acid to 4 parts of water
- C. 4 parts of acid to 6 parts of water
- D. 4 parts of acid to 8 parts of water

Answer: C

4185. Local action in a battery is indicated by

- A. excessive gassing under load conditions
- B. excessive drop in the specific gravity of electrolyte even when the cell is on open circuit
- C. both A. and B
- D. none of the above

Answer: D

4186. Following will happen if battery charging rate is too high

- A. excessive gassing will occur
- B. temperature rise will occur
- C. bulging and buckling of plates will occur
- D. all above will occur

Answer: D

4187. Internal resistance of a cell is due to

- A. resistance of electrolyte
- B. electrode resistance
- C. surface contact resistance between electrode and electrolyte
- D. all above

Answer: D

4188. If a battery is wrongly connected on charge following will happen

- A. current delivered by the battery will be high
- B. current drawing will be nil
- C. current drawing will be very small
- D. current drawing will be very high

Answer: D

4189. In order that a hydrometer may float vertically in electrolyte its C.G. should be

- A. lowered
- B. raised
- C. undisturbed
- D. displaced sideways

Answer: A

4190. If a lead-acid cell is discharged below 1.8 V the following will happen.

- A. Capacity of cell will reduce
- B. Sulphation of plates will occur
- C. Internal resistance will increase
- D. All above will occur

Answer: D

4191. Life of the batteries is in the following ascending order.

- A. Lead-acid cell, Edison cell, Nickel cadmium cell
- B. Lead-acid cell, Nickel-cadmium cell, Edison cell
- C. Edison cell, Nickel-cadmium cell, lead-acid cell
- D. Nickel-cadmium cell, Edison cell, lead-acid cell

Answer: A

4192. Persons preparing electrolyte should wear

- A. goggles or other face shield
- B. rubber
- C. rubber boots and gloves
- D. all above safety devices

Answer: D

4193. Excessive charging a battery tends to

- A. produce gassing
- B. increase the internal resistance of the battery
- C. to corrode the positive plates into lead peroxide thereby weakening them physically
- D. bring about all above changes

Answer: D

- 4194. Shelf life of a small dry cell is**
A. equal to that of large dry cell
B. less than that of large dry cell
C. more than that of large dry cell
D. none of the above

Answer: B

- 4195. The current flow through electrolyte is due to the movement of**
A. ions
B. holes
C. electrons
D. none of the above

Answer: A

- 4196. Level of electrolyte in a cell should be _____ the level of plates**
A. below
B. equal to
C. above
D. none of the above

Answer: C

- 4197. During discharge, the active material of both the positive and negative plates is changed to**
A. Pb
B. PbO₂
C. PbO
D. PbSO₄

Answer: D

- 4198. _____ of electrolyte indicates the state of charge of the battery**
A. colour
B. mass
C. viscosity
D. specific gravity

Answer: D

- 4199. The following indicate that battery on charge has attained full charge**
A. colour of electrode
B. gassing
C. specific gravity
D. all above

Answer: D

- 4200. Dry cell is modification of**
A. Daniell cell
B. Leclanche cell
C. Lead-acid cell
D. Edison cell

Answer: B

4201. Capacity of a battery is expressed in

- A. Ah
- B. Vh
- C. Wh
- D. kWh

Answer: A

4202. In alkaline cell the electrolyte is

- A. dilute sulphuric acid
- B. concentrated sulphuric acid
- C. NaOH
- D. KOH

Answer: D

4203. Self charge of a Ni-Fe cell is _____ Edison cell.

- A. equal to
- B. less than
- C. more than
- D. much more than

Answer: B

4204. Ampere hour capacity of an industrial battery is based on _____ hours discharge rate.

- A. 8
- B. 12
- C. 16
- D. 24

Answer: A

4205. The body of Edison cell is made of

- A. bakelite
- B. rubber
- C. nickel plated steel
- D. aluminium

Answer: C

4206. Specific gravity of electrolyte in Edison cell is

- A. 0.8
- B. 0.95
- C. 1.1
- D. 1.21

Answer: D

4207. All the electrical connections between the battery and vehicle should be by

- A. thin aluminium wires
- B. thin copper wires
- C. rigid cables
- D. flexible cables

Answer: D

4208. A battery of 6 cells will show a drop of _____ volts from fully charged state to fully discharged state.

- A. 1.0
- B. 1.5
- C. 2.4
- D. 2.9

Answer: C

4209. During the idle period of the battery, strong electrolyte tends to change the active material of the cell into

- A. PbO_2
- B. $PbSO_4$
- C. PbO
- D. Pb

Answer: B

4210. Charging of sulphated battery produces _____ heat.

- A. no
- B. very little
- C. less
- D. more

Answer: D

4211. Hydrogen evolved during charging produces explosive mixture when it is more than

- A. 2%
- B. 4%
- C. 6%
- D. 8%

Answer: D

4212. Weston standard cell at 20°C has voltage of _____ volts.

- A. 0.8
- B. 0.9
- C. 1.0187
- D. 1.5

Answer: C

4213. Extent of corrosion in the underground metal work depends upon

- A. amount of moisture
- B. type of metals
- C. type of soil chemicals
- D. all above factors

Answer: D

4214. Mercury cell has which of the following characteristics ?

- A. Flat discharge current-voltage curve
- B. High power to weight ratio
- C. Comparatively longer shelf life under adverse conditions of high temperature and humidity
- D. All of the above

Answer: D

4215. Charging a sulphated battery at high rate results in

- A. boiling of electrolyte due to gassing
- B. warping of plates
- C. damage to separators, cell caps covers and battery case due to excessive temperature
- D. all above

Answer: D

4216. Short circuiting of a cell may be caused

- A. buckling of plates
- B. faulty separators
- C. lead particles forming circuit between positive and negative plates
- D. All of the above

Answer: D

4217. In a battery cover is placed over the element and sealed to the top of the battery container. This is done

- A. to reduce evaporation of water from electrolyte
- B. to exclude dirt and foreign matter from the electrolyte
- C. to discharge both of the above functions
- D. to discharge none of the above functions

Answer: C

4218. For a cell to work, which of the following condition(s) become necessary ?

- A. Two electrodes of different meta's should be inserted in the electrolyte, not touching each other
- B. Electrolyte must chemically react with one of the electrodes
- C. Electrolyte liquid or paste should be conducting
- D. All above three conditions are necessary

Answer: D

4219. Which of the following primary cells has the lowest voltage ?

- A. Lithium
- B. Zinc-chloride
- C. Mercury
- D. Carbon-zinc

Answer: C

4220. Which of the following primary cells has the highest voltage ?

- A. Manganese-alkaline
- B. Carbon-zinc
- C. Lithium
- D. Mercury

Answer: C

4221. While preparing electrolyte for a lead-acid battery

- A. water is poured into acid
- B. acid is poured into water
- C. anyone of the two can be added to other chemical

Answer: B

4222. Which of the following battery is used for air-craft ?

- A. Lead-acid battery
- B. Nickel-iron battery
- C. Dry cell battery
- D. Silver oxide battery

Answer: B

4223. Which of the following cell has a reversible chemical reaction ?

- A. Lead-acid
- B. Mercury oxide
- C. Carbon-zinc
- D. Silver-oxide

Answer: A

4224. Which of the following is incorrect ?

- A. A storage cell has a reversible chemical reaction
- B. A lead-acid cell can be recharged
- C. A carbon-zinc cell has unlimited shelf life
- D. A primary cell has an irreversible chemical reaction

Answer: C

4225. Which of the following has lower sp. gravity V

- A. Dilute H_2SO_4
- B. Concentrated H_2SO_4
- C. Water
- D. Any of the above

Answer: C

4226. Under normal charging rate, the charging current should be

- A. 10% of capacity
- B. 20% of capacity
- C. 30% of capacity
- D. 40% of capacity

Answer: A

4227. When two batteries are connected in parallel, it should be ensured that

- A. they have same e.m.f.
- B. they have same make
- C. they have same ampere-hour capacity
- D. they have identical internal resistance

Answer: A

4228. A typical output of a solar cell is

- A. 0.1V
- B. 0.26 V
- C. 1.1 V
- D. 2 V

Answer: B

4229. Petroleum jelly is applied to the electrical connections to the lead-acid battery

- A. prevent local heating
- B. prevent short-circuiting
- C. reduce path resistance
- D. prevent corrosion

Answer: D

4230. When the load resistance equals the generator resistance which of the following will be maximum ?

- A. Current
- B. Efficiency of the circuit
- C. Power in the load resistance
- D. Voltage across the load resistance

Answer: C

4231. The common impurity in the electrolyte of lead-acid battery is

- A. chlorine
- B. dust particles
- C. lead crystals
- D. iron

Answer: D

4232. In a lead-acid battery the energy is stored in the form of

- A. charged ions
- B. chemical energy
- C. electrostatic energy
- D. electromagnetic energy

Answer: B

4233. Which among the following constitutes the major load for an automobile battery ?

- A. Brake light
- B. Self starter
- C. Parking lights
- D. Spark plugs

Answer: B

4234. Which of the following factors adversely affects the capacity of the leadacid battery ?

- A. Temperature of surroundings
- B. Specific gravity of electrolyte
- C. Rate of discharge
- D. All of the above

Answer: D

4235. Cells are connected in parallel to

- A. increase the efficiency
- B. increase the current capacity
- C. increase the voltage output
- D. increase the internal resistance

Answer: B

4236. A constant-voltage generator has

- A. minimum efficiency
- B. minimum current capacity
- C. low internal resistance
- D. high internal resistance

Answer: C

4237. Satellite power requirement is provided through

- A. solar cells
- B. dry cells
- C. nickel-cadmium cells
- D. lead-acid batteries

Answer: A

e) Lifts, Pumps, Air Conditioning and refrigeration system

4239. In a refrigeration cycle, the flow of refrigerant is controlled by

- (a) Compressor
- (b) Condenser
- (c) Evaporator
- (d) Expansion valve

Ans: (d)

4240. The colour of the flame of halide torch, in case of leakage of Freon refrigerant, will change to

- (a) Bright green
- (b) Yellow
- (c) Red
- (d) Orange

Ans: (a)

4241. For air conditioning the operation theatre in a hospital, the percentage of outside air in the air supplied is

- (a) Zero
- (b) 20
- (c) 50
- (d) 100

Ans: (d)

4242. In vapour compression cycle using NH_3 as refrigerant, initial charge is filled at

- (a) Suction of compressor
- (b) Delivery of compressor
- (c) High pressure side close to receiver
- (d) Low pressure side near receiver

Ans: (c)

4243. The temperature of air recorded by a thermometer, when it is not affected by the moisture present in the air, is called

- (a) Wet bulb temperature
- (b) Dry bulb temperature
- (c) Dew point temperature
- (d) None of these

Ans: (b)

4244. Absorption system normally uses the following refrigerant

- (a) Freon-11
- (b) Freon-22
- (c) CO₂
- (d) Ammonia

Ans: (d)

4245. Which of the following statements is correct?

- (a) In a vapour absorption refrigerator, the compression of refrigerant is avoided.
- (b) Sub-cooling can be achieved by circulating more quantities of cooling water through the condenser.
- (c) In vapour compression refrigeration, the vapour is drawn in the compressor cylinder during its suction stroke and is compressed adiabatically during the compression stroke.
- (d) All of the above

Ans: (d)

4246. Allowable pressure on high pressure side or ammonia absorption system is of the order of

- (a) Atmospheric pressure
- (b) Slightly above atmospheric pressure
- (c) 24 bars
- (d) 56 bars

Ans: (d)

4247. The C.O.P. of a Carnot refrigerator in winter will be _____ as compared to C.O.P. in summer.

- (a) Same
- (b) Lower
- (c) Higher
- (d) None of these

Ans: (c)

4248. Chaperon equation is a relation between

- (a) Temperature, pressure and enthalpy
- (b) Specific volume and enthalpy
- (c) Temperature and enthalpy
- (d) Temperature, pressure, specific volume and enthalpy

Ans: (d)

4249. During humidification process, _____ increases.

- (a) Wet bulb temperature
- (b) Relative humidity
- (c) Dry bulb temperature
- (d) Specific humidity

Ans: (b)

4250. Where does the lowest temperature occur in a vapour compression cycle?

- (a) Condenser
- (b) Evaporator
- (c) Compressor
- (d) Expansion valve

Ans: (b)

4251. The ratio of actual mass of water vapour in a given volume of moist air to the mass of water vapour in the same volume of saturated air at the same temperature and pressure, is called

- (a) Humidity ratio
- (b) Relative humidity
- (c) Absolute humidity
- (d) Degree of saturation

Ans: (b)

4252. Under cooling in a refrigeration cycle

- (a) Increases C.O.P
- (b) Decreases C.O.P
- (c) C.O.P remains unaltered
- (d) Other factors decide C.O.P

Ans: (a)

4253. In a domestic vapour compression refrigerator, the refrigerant commonly used is

- (a) CO_2
- (b) Ammonia
- (c) R-12
- (d) All of these

Ans: (c)

4254. The COP of a vapour compression plant in comparison to vapour absorption plant is

- (a) More
- (b) Less
- (c) Same
- (d) More/less depending on size of plant

Ans: (a)

4255. The fluids used in Electrolux refrigerator are

- (a) Water and hydrogen
- (b) Ammonia and hydrogen
- (c) Ammonia, water and hydrogen
- (d) None of these

Ans: (c)

4256. Domestic refrigerator working on vapour compression cycle uses the following type of expansion device

- (a) Electrically operated throttling valve
- (b) Manually operated valve
- (c) Thermostatic valve
- (d) Capillary tube

Ans: (d)

4257. The condition of refrigerant after passing through the expansion or throttle valve, in a vapour compression system is

- (a) High pressure saturated liquid
- (b) Wet vapour
- (c) Very wet vapour
- (d) Dry vapour

Ans: (c)

4258. An important characteristic of absorption system of refrigeration is

- (a) Noisy operation
- (b) Quiet operation
- (c) Cooling below 0°C
- (d) Very little power consumption

Ans: (b)

4259. The centrifugal compressors are generally used for refrigerants that require

- (a) Small displacements and low condensing pressures
- (b) Large displacements and high condensing pressures
- (c) Small displacements and high condensing pressures
- (d) Large displacements and low condensing pressures

Ans: (d)

4260. Pick up the incorrect statement

- (a) Lithium bromide used in vapour absorption cycle is non volatile
- (b) Lithium bromide plant can't operate below 0°C
- (c) A separator is used in lithium bromide plant to remove the unwanted water vapour by condensing
- (d) Concentration of solution coming out of lithium bromide generator is more in comparison to that entering the generator

Ans: (c)

4261. During dehumidification process, the relative humidity

- (a) Remains constant
- (b) Increases
- (c) Decreases
- (d) None of these

Ans: (c)

4262. The refrigerant widely used in domestic refrigerators is

- (a) Ammonia
- (b) Carbon dioxide
- (c) Sulphur dioxide
- (d) R-12

Ans: (d)

4263. The moisture in a refrigerant is removed by

- (a) Evaporator
- (b) Safety relief valve
- (c) Dehumidifier
- (d) Driers

Ans: (d)

4264. During sensible cooling of air _____ decreases.

- (a) Wet bulb temperature
- (b) Relative humidity
- (c) Dry bulb temperature
- (d) Specific humidity

Ans: (c)

4265. At lower temperatures and pressures, the latent heat of vaporisation of a refrigerant

- (a) Decreases
- (b) Increases
- (c) Remain same
- (d) Depends on other factors

Ans: (b)

4266. The wet bulb depression is zero when relative humidity is

- (a) Zero
- (b) 0.5
- (c) 0.75
- (d) 1.0

Ans: (d)

4267. The C.O.P of a refrigeration cycle with increase in evaporator temperature, keeping condenser temperature constant, will

- (a) Increase
- (b) Decrease
- (c) Remain unaffected
- (d) May increase or decrease depending on the type of refrigerant used

Ans: (a)

4268. During humidification process, dry bulb temperature

- (a) Remains constant
- (b) Increases
- (c) Decreases
- (d) None of these

Ans: (a)

4269. The vapour pressure of refrigerant should be

- (a) Lower than atmospheric pressure
- (b) Higher than atmospheric pressure
- (c) Equal to atmospheric pressure
- (d) Could be anything

Ans: (b)

4270. Which of the following statement is wrong?

- (a) The performance of the vapour compression refrigerator varies considerably with both vaporising and condensing temperatures.
- (b) In vapour compression cycle, the useful part of the heat transfer is at the condenser.
- (c) In ammonia-hydrogen (Electrolux) refrigerator, no compressor, pump or fan is required.
- (d) The effect of under-cooling the liquid refrigerant is to decrease the coefficient of performance.

Ans: (d)

4271. In a vapour compression system, the condition of refrigerant before passing through the condenser is

- (a) Saturated liquid
- (b) Wet vapour
- (c) Dry saturated vapour
- (d) Superheated vapour

Ans: (d)

4272. For proper refrigeration in a cabinet, if the temperature and vapour pressure difference between cabinet and atmosphere is high, then

- (a) Bigger cabinet should be used
- (b) Smaller cabinet should be used
- (c) Perfectly tight vapour seal should be used
- (d) Refrigerant with lower evaporation temperature should be used

Ans: (c)

4273. During sensible heating of air _____ decreases.

- (a) Wet bulb temperature
- (b) Relative humidity
- (c) Dry bulb temperature
- (d) Specific humidity

Ans: (b)

4274. One ton refrigeration corresponds to

- (a) 50 kcal/ min
- (b) 50 kcal/ hr
- (c) 80 kcal/ min
- (d) 80 kcal/ hr

Ans: (a)

4275. The process, generally used in winter air-conditioning to warm and humidity the air, is called

- (a) Humidification
- (b) Dehumidification
- (c) Heating and humidification
- (d) Cooling and dehumidification

Ans: (c)

4276. The leaks in a refrigeration system using Freon are detected by

- (a) Halide torch which on detection produces greenish flame lighting
- (b) Sulphur sticks which on detection gives white smoke
- (c) Using reagents
- (d) Smelling

Ans: (a)

4277. The reduced ambient air cooling system has

- (a) One cooling turbine and one heat exchanger
- (b) One cooling turbine and two heat exchangers
- (c) Two cooling turbines and one heat exchanger
- (d) Two cooling turbines and two heat exchangers

Ans: (c)

4278. In vapour compression cycle, the condition of refrigerant is saturated liquid

- (a) After passing through the condenser
- (b) Before passing through the condenser
- (c) After passing through the expansion throttle valve
- (d) Before entering the expansion valve

Ans: (a)

4279. Which of the following refrigerant has the maximum ozone depletion potential in the stratosphere?

- (a) Ammonia
- (b) Carbon dioxide
- (c) Sulphur dioxide
- (d) Fluorine

Ans: (d)

4280. If the evaporator temperature of a plant is lowered, keeping the condenser temperature constant, the h.p. of compressor required will be

- (a) Same
- (b) More
- (c) Less
- (d) More/less depending on rating

Ans: (b)

4281. Hydrogen is used in Electrolux refrigeration system so as to_____ the rate of evaporation of the liquid ammonia passing through the evaporator.

- (a) Equalise
- (b) Reduce

- (c) Increase
- (d) None of these

Ans: (c)

4282. Pick up the wrong statement. A refrigerant should have

- (a) Low specific heat of liquid
- (b) High boiling point
- (c) High latent heat of vaporisation
- (d) Higher critical temperature

Ans: (b)

4283. The pressure at the inlet of a refrigerant compressor is called

- (a) Suction pressure
- (b) Discharge pressure
- (c) Critical pressure
- (d) Back pressure

Ans: (a)

4284. Condensing temperature in a refrigerator is the temperature

- (a) Of cooling medium
- (b) Of freezing zone
- (c) Of evaporator
- (d) At which refrigerant gas becomes liquid

Ans: (d)

4285. In aircraft, air refrigeration Cycle is used because of

- (a) Low weight per tonne of refrigeration
- (b) High heat transfer rate
- (c) Low temperature at high altitudes
- (d) Higher coefficient of performance

Ans: (a)

4286. Highest pressure encountered in a refrigeration system should be

- (a) Critical pressure of refrigerant
- (b) Much below critical pressure
- (c) Much above critical pressure
- (d) Near critical pressure

Ans: (b)

4287. The refrigerant used for absorption refrigerators working on heat from solar collectors is a mixture of water and

- (a) Carbon dioxide
- (b) Sulphur dioxide
- (c) Lithium bromide
- (d) R-12

Ans: (c)

- 4288.** One ton of the refrigeration is
- (a) The standard unit used in refrigeration problems
 - (b) The cooling effect produced by melting 1 ton of ice
 - (c) The refrigeration effect to freeze 1 ton of water at 0°C into ice at 0°C in 24 hours
 - (d) The refrigeration effect to produce 1 ton of ice at NTP conditions

Ans: (c)

- 4289.** The dry bulb temperature during sensible heating of air

- (a) Remains constant
- (b) Increases
- (c) Decreases
- (d) None of these

Ans: (b)

- 4290.** Vertical lines on pressure-enthalpy chart show constant

- (a) Pressure lines
- (b) Temperature lines
- (c) Total heat lines
- (d) Entropy lines

Ans: (c)

- 4291.** During heating and dehumidification process, dry bulb temperature

- (a) Remains constant
- (b) Increases
- (c) Decreases
- (d) None of these

Ans: (b)

- 4292.** The evolution of heat of solution takes place in ammonia absorption plant when

- (a) Ammonia vapour goes into solution
- (b) Ammonia vapour is driven out of solution
- (c) Lithium bromide mixes with ammonia
- (d) Weak solution mixes with strong solution

Ans: (a)

- 4293.** In a pressure enthalpy chart, the space to the left of the saturated liquid line represents

- (a) Wet vapour region
- (b) Superheated vapour region
- (c) Sub-cooled liquid region
- (d) None of these

Ans: (c)

- 4294.** In vapour compression cycle, the condition of refrigerant is high pressure saturated liquid

- (a) After passing through the condenser
- (b) Before passing through the condenser
- (c) After passing through the expansion or throttle valve
- (d) Before entering the expansion valve

Ans: (d)

- 4295.** In a bootstrap air evaporative cooling system, the evaporator is provided
- (a) Between the combustion chamber and the first heat exchanger
 - (b) Between the first heat exchanger and the secondary compressor
 - (c) Between the secondary compressor and the second heat exchanger
 - (d) Between the second heat exchanger and the cooling turbine

Ans: (d)

- 4296.** The COP of a domestic refrigerator

- (a) Is less than 1
- (b) Is more than 1
- (c) Is equal to 1
- (d) Depends upon the make

Ans: (b)

- 4297.** The air cooling system mostly used in transport type aircrafts is

- (a) Simple air cooling system
- (b) Simple evaporative air cooling system
- (c) Bootstrap air cooling system
- (d) All of these

Ans: (c)

- 4298.** The higher temperature in vapour compression cycle occurs at

- (a) Receiver
- (b) Expansion valve
- (c) Evaporator
- (d) Compressor discharge

Ans: (d)

- 4299.** Dry bulb temperature is the temperature of air recorded by a thermometer, when

- (a) It is not affected by the moisture present in the air
- (b) Its bulb is surrounded by a wet cloth exposed to the air
- (c) The moisture present in it begins to condense
- (d) None of the above

Ans: (a)

- 4300.** In refrigerators, the temperature difference between the evaporating refrigerant and the medium being cooled should be

- (a) High, of the order of 25°
- (b) As low as possible (3 to 11°C)
- (c) Zero
- (d) Any value

Ans: (b)

- 4301.** The evaporator changes the low pressure liquid refrigerant from the expansion valve into

- (a) High pressure liquid refrigerant
- (b) Low pressure liquid and vapour refrigerant
- (c) Low pressure vapour refrigerant
- (d) None of these

Ans: (c)

4302. Choose the correct statement

- (a) A refrigerant should have low latent heat
- (b) If operating temperature of system is low, then refrigerant with low boiling point should be used
- (c) Pre-cooling and sub-cooling of refrigerant are same
- (d) Superheat and sensible heat of a refrigerant are same

Ans: (b)

4303. Carbon dioxide is

- (a) Colourless
- (b) Odourless
- (c) Non-flammable
- (d) All of these

Ans: (d)

4304. Reducing suction pressure in refrigeration cycle

- (a) Lowers evaporation temperature
- (b) Increases power required per ton of refrigeration
- (c) Lowers compressor capacity because vapour is lighter
- (d) All of the above

Ans: (d)

4305. The coefficient of performance of a domestic refrigerator is_____ as compared to a domestic air-conditioner.

- (a) Same
- (b) Less
- (c) More
- (d) None of these

Ans: (b)

4306. If a gas is to be liquefied, its temperature must be

- (a) Increased to a value above its critical temperature
- (b) Reduced to a value below its critical temperature
- (c) Equal to critical temperature
- (d) None of the above

Ans: (c)

4307. The capacity of a domestic refrigerator is in the range of

- (a) 0.1 to 0.3 TR
- (b) 1 to 3 TR
- (c) 3 to 5 TR
- (d) 5 to 7 TR

Ans: (a)

4308. The lowest thermal diffusivity is of

- (a) Iron
- (b) Lead
- (c) Aluminium
- (d) Rubber

Ans: (d)

4309. In a vapour compression cycle, the refrigerant immediately after expansion valve is

- (a) Liquid
- (b) Subcooled liquid
- (c) Saturated liquid
- (d) Wet vapour

Ans: (d)

4310. Which of the following statement is correct for ammonia as a refrigerant?

- (a) It is toxic to mucous membranes.
- (b) It requires large displacement per TR compared to fluoro carbons.
- (c) It reacts with copper and its alloys.
- (d) All of these

Ans: (d)

4311. Critical pressure of a liquid is the pressure

- (a) Above which liquid will remain liquid
- (b) Above which liquid becomes gas
- (c) Above which liquid becomes vapour
- (d) Above which liquid becomes solid

Ans: (a)

4312. The optimum effective temperature for human comfort is

- (a) Higher in winter than in summer
- (b) Lower in winter than in summer
- (c) Same in winter and summer
- (d) Not dependent on season

Ans: (b)

4313. Formation of frost on evaporator in refrigerator

- (a) Results in loss of heat due to poor heat transfer
- (b) Increases heat transfer rate
- (c) Is immaterial
- (d) Can be avoided by proper design

Ans: (a)

4314. A one tonne refrigerating machine means that

- (a) One tonne is the total mass of machine
- (b) One tonne refrigerant is used
- (c) One tonne of water can be converted into ice
- (d) One tonne of ice when melts from and at 0°C in 24 hours, the refrigeration effect is Equivalent to 210 kJ/min

Ans: (d)

4315. The suction pipe diameter of refrigerating unit compressor in comparison to delivery side is

- (a) Bigger
- (b) Smaller

- (c) Equal
- (d) Smaller/bigger depending on capacity

Ans: (a)

4316. The coefficient of performance (C.O.P.) of a refrigerator working as a heat pump is given by

- (a) $(C.O.P)_P = (C.O.P)_R + 2$
- (b) $(C.O.P)_P = (C.O.P)_R + 1$
- (c) $(C.O.P)_P = (C.O.P)_R - 1$
- (d) $(C.O.P)_P = (C.O.P)_R$

Ans: (b)

4317. Presence of moisture in a refrigerant affects the working of

- (a) Compressor
- (b) Condenser
- (c) Evaporator
- (d) Expansion valve

Ans: (d)

4318. During heating and humidification, the final relative humidity of air

- (a) Can be lower or higher than that of the entering air
- (b) Is lower than that of the entering air
- (c) Is higher than that of the entering air
- (d) None of the above

Ans: (a)

4319. Which of the following cycles uses air as the refrigerant?

- (a) Ericson
- (b) Stirling
- (c) Carnot
- (d) Bell Coleman

Ans: (d)

4320. The curved lines on a psychrometric chart indicates

- (a) Dry bulb temperature
- (b) Wet bulb temperature
- (c) Dew point temperature
- (d) Relative humidity

Ans: (d)

4321. On the pressure-enthalpy diagram, condensation and desuperheating is represented by a horizontal line because the process

- (a) Involves no change in volume
- (b) Takes place at constant temperature
- (c) Takes place at constant entropy
- (d) Takes place at constant pressure

Ans: (d)

4322. When the temperature of the surrounding is higher than the temperature of the body, then the heat loss by convection from the body to the surrounding will be

- (a) Positive
- (b) Negative
- (c) Zero
- (d) None of these

Ans: (b)

4323. The general rule for rating refrigeration systems (excepting for CO₂ system) is to approximate the following h.p. per ton of refrigeration

- (a) 0.1 to 0.5 h.p. per ton of refrigeration
- (b) 0.5 to 0.8 h.p. per ton of refrigeration
- (c) 1 to 2 h.p. per ton of refrigeration
- (d) 2 to 5 h.p. per ton of refrigeration

Ans: (c)

4324. The atmospheric air at dry bulb temperature of 15°C enters a heating coil maintained at 40°C. The air leaves the heating coil at 25°C. The bypass factor of the heating coil is

- (a) 0.376
- (b) 0.4
- (c) 0.6
- (d) 0.67

Ans: (c)

4325. The change in evaporator temperature in a refrigeration cycle, as compared to change in condenser temperature, influences the value of C.O.P.

- (a) More
- (b) Less
- (c) Equally
- (d) Unpredictable

Ans: (a)

4326. Most thermostatic expansion valves are set for a superheat of

- (a) 5°C
- (b) 10°C
- (c) 15°C
- (d) 20°C

Ans: (a)

4327. In a refrigeration system, heat absorbed in comparison to heat rejected is

- (a) More
- (b) Less
- (c) Same
- (d) More for small capacity and less for high capacity

Ans: (b)

- 4328.** A thermostatic expansion valve in a refrigeration system
- (a) Ensures the evaporator completely filled with refrigerant of the load
 - (b) Is suitable only for constant load systems
 - (c) Maintains different temperatures in evaporator in proportion to load
 - (d) None of the above

Ans: (a)

- 4329.** Freon group of refrigerants are
- (a) Inflammable
 - (b) Toxic
 - (c) Non-inflammable and toxic
 - (d) Nontoxic and non-inflammable

Ans: (d)

- 4330.** The boiling point of ammonia is
- (a) -10.5°C
 - (b) -30°C
 - (c) -33.3°C
 - (d) -77.7°C

Ans: (c)

- 4331.** For obtaining high COP, the pressure range of compressor should be
- (a) High
 - (b) Low
 - (c) Optimum
 - (d) Any value

Ans: (b)

- 4332.** A reversible engine has an ideal thermal efficiency of 30%. When it is used as a refrigerating machine with all other conditions unchanged, the coefficient of performance will be
- (a) 1.33
 - (b) 2.33
 - (c) 3.33
 - (d) 4.33

Ans: (b)

- 4333.** Cooling water is required for following equipment in ammonia absorption plant
- (a) Condenser
 - (b) Evaporator
 - (c) Absorber
 - (d) Condenser, absorber and separator (rectifier)

Ans: (d)

- 4334.** The freezing point of sulphur dioxide is
- (a) -56.6°C
 - (b) -75.2°C
 - (c) -77.7°C
 - (d) -135.8°C

Ans: (b)

4335. Mass flow ratio of NH_3 in comparison to Freon12 for same refrigeration load and same temperature limits is of the order of

- (a) 1 : 1
- (b) 1 : 9
- (c) 9 : 1
- (d) 1 : 3

Ans: (b)

4336. In a refrigeration system, the expansion device is connected between the

- (a) Compressor and condenser
- (b) Condenser and receiver
- (c) Receiver and evaporator
- (d) Evaporator and compressor

Ans: (c)

4337. The vapour compression refrigerator employs the following cycle

- (a) Rankine
- (b) Carnot
- (c) Reversed Rankine
- (d) Reversed Carnot

Ans: (d)

4338. In actual air-conditioning applications for R-12 and R-22, and operating at a condenser temperature of 40°C and an evaporator temperature of 5°C , the heat rejection factor is About

- (a) 1
- (b) 1.25
- (c) 2.15
- (d) 5.12

Ans:(b)

4339. Low specific speed of a pump implies it is

- (a) Centrifugal pump
- (b) Mixed flow pump
- (c) Axial flow pump
- (d) None of the above

Ans: (a)

4340. Head developed by a centrifugal pump is

- (a) Proportional to diameter of impeller
- (b) Proportional to speed of impeller
- (c) Proportional to diameter and speed of impeller
- (d) None of the above

Ans: (c)

4341. In centrifugal pumps, maximum efficiency is obtained when the blades are

- (a) Straight
- (b) Bent forward
- (c) Bent backward
- (d) Radial

Ans: (c)

4342. Which of the following pump is suitable for small discharge and high heads?

- (a) Centrifugal pump
- (b) Axial flow pump
- (c) Mixed flow pump
- (d) Reciprocating pump

Ans: (d)

4343. For small discharge at high pressure, following pump is preferred

- (a) Centrifugal
- (b) Axial flow
- (c) Mixed flow
- (d) Reciprocating

Ans: (d)

4344. In a single casing, multistage pump running at constant speed, the capacity rating is to be slightly lowered. It can be done by

- (a) Designing new impeller
- (b) Trimming the impeller size to the required size by machining
- (c) Not possible
- (d) Some other alterations in the impeller

Ans: (b)

4345. If a pump is handling water and is discharging a certain flow Q at a constant total dynamic head requiring a definite B.H.P., the same pump when handling a liquid of specific gravity

0.75 and viscosity nearly same as of water, the horse power required will be

- (a) Same
- (b) 0.75 B.H.P.
- (c) B.H.P./0.75
- (d) 1.5 B.H.P.

Ans: (b)

4346. In a centrifugal pump, the liquid enters the pump

- (a) At the top
- (b) At the bottom
- (c) At the center
- (d) From sides

Ans: (c)

4347. For very high discharge at low pressure such as for flood control and irrigation applications, following type of pump is preferred

- (a) Centrifugal
- (b) Axial flow
- (c) Reciprocating
- (d) Mixed flow

Ans: (b)

4348. The specific speed (N_s) of a centrifugal pump is given by

- (a) $(N\sqrt{Q})/H^{2/3}$
- (b) $(N\sqrt{Q})/H^{3/4}$
- (c) $(N\sqrt{Q})/H$
- (d) $(N\sqrt{Q})/H^{5/4}$

Ans: (b)

4349. Air vessels in reciprocating pump are used to

- (a) Smoothen flow
- (b) Reduce acceleration to minimum
- (c) Increase pump efficiency
- (d) Save pump from cavitations

Ans: (b)

4350. If the net positive suction head ($NPSH$) requirement for the pump is not satisfied, then

- (a) No flow will take place
- (b) Cavitation will be formed
- (c) Efficiency will be low
- (d) Excessive power will be consumed

Ans: (b)

4351. Discharge of a centrifugal pump is (where N = Speed of the pump impeller)

- (a) Directly proportional to N
- (b) Inversely proportional to N
- (c) Directly proportional to N^2
- (d) Inversely proportional to N^2

Ans: (a)

4352. Saving of work done and power by fitting an air vessel to single acting reciprocating pump is of the order of

- (a) 39.2 %
- (b) 49.2 %
- (c) 68.8 %
- (d) 84.8 %

Ans:

(d)

4353. Overall efficiency of a centrifugal pump is the ratio of

- (a) Energy available at the impeller to the energy supplied to the pump by the prime mover
- (b) Actual workdone by the pump to the energy supplied to the pump by the

- prime mover
- (c) Energy supplied to the pump to the energy available at the impeller
- (d) Manometric head to the energy supplied by the impeller per kN of water

Ans: (b)

4354. Which of the following pump is generally used to pump highly viscous fluid?

- (a) Centrifugal pump
- (b) Reciprocating pump
- (c) Air lift pump
- (d) Screw pump

Ans: (d)

4355. In order to avoid cavitation in centrifugal pumps

- (a) The suction pressure should be high
- (b) The delivery pressure should be high
- (c) The suction pressure should be low
- (d) The delivery pressure should be low

Ans: (a)

4356. The centrifugal pump preferred for a specific speed between 80 to 160 r.p.m. is

- (a) Slow speed with radial flow at outlet
- (b) Medium speed with radial flow at outlet
- (c) High speed with radial flow at outlet
- (d) High speed with mixed flow at outlet

Ans: (d)

4357. A centrifugal pump will start delivering liquid only when the pressure rise in the impeller is equal to the

- (a) Kinetic head
- (b) Velocity head
- (c) Manometric head
- (d) Static head

Ans: (c)

4358. The ratio of quantity of liquid discharged per second from the pump to the quantity of liquid passing per second through the impeller is known as

- (a) Manometric efficiency
- (b) Mechanical efficiency
- (c) Overall efficiency
- (d) Volumetric efficiency

Ans: (d)

4359. Discharge (Q) of a centrifugal pump is given by (where D = Diameter of impeller at inlet, b = Width of impeller at inlet, and V_f = Velocity of flow at inlet)

- (a) $Q = \pi.D.V_f$
- (b) $Q = \pi.b.V_f$
- (c) $Q = \pi.D.b.V_f$
- (d) $Q = D.b.V_f$

Ans: (c)

4360. Multistage centrifugal pumps are used to obtain

- (a) High discharge
- (b) High head
- (c) Pumping of viscous fluids
- (d) High head and high discharge

Ans: (b)

4361. Multistage centrifugal pumps are used to

- (a) Give high discharge
- (b) Produce high heads
- (c) Pump viscous fluids
- (d) All of these

Ans: (b)

4362. Reciprocating pumps are no more to be seen in industrial applications (in comparison to centrifugal pumps) because of

- (a) High initial and maintenance cost
- (b) Lower discharge
- (c) Lower speed of operation
- (d) Necessity of air vessel

Ans: (a)

4363. Axial flow pump is started with its delivery valve

- (a) Kept fully closed
- (b) Kept fully open
- (c) Irrespective of any position
- (d) Kept 50% open

Ans: (b)

4364. Head developed by a centrifugal pump depends on

- (a) Impeller diameter
- (b) Speed
- (c) Fluid density
- (d) Both (A) and (B) above

Ans: (d)

4365. Centrifugal pump is started with its delivery valve

- (a) Kept fully closed
- (b) Kept fully open
- (c) Irrespective of any position
- (d) Kept 50% open

Ans: (a)

4366. In a centrifugal pump casing, the flow of water leaving the impeller, is

- (a) Rectilinear flow
- (b) Radial flow
- (c) Free vortex motion
- (d) Forced vortex

Ans: (c)

4367. Which type of the pump is different from others in the same group?

- (a) Screw pump
- (b) Gear pump
- (c) Cam and piston pump
- (d) Plunger pump

Ans: (d)

4368. When a piping system is made up primarily of vertical lift and very little pipe friction, the pump characteristics should be

- (a) Horizontal
- (b) Nearly horizontal
- (c) Steep
- (d) First rise and then fall

Ans: (c)

4369. Power required to drive a centrifugal pump is directly proportional to ____ of its impeller.

- (a) Diameter
- (b) Square of diameter
- (c) Cube of diameter
- (d) Fourth power of diameter

Ans: (d)

4370. Discharge of a centrifugal pump is

- (a) Directly proportional to diameter of its impeller
- (b) Inversely proportional to diameter of its impeller
- (c) Directly proportional to (diameter)² of its impeller
- (d) Inversely proportional to (diameter)² of its impeller

Ans: (d)

4371. Slip of a reciprocating pump is defined as the

- (a) Ratio of actual discharge to the theoretical discharge
- (b) Sum of actual discharge and the theoretical discharge
- (c) Difference of theoretical discharge and the actual discharge
- (d) Product of theoretical discharge and the actual discharge

Ans: (c)

4372. Delivery head of a centrifugal pump is

- (a) Directly proportional to N
- (b) Inversely proportional to N
- (c) Directly proportional to N^2
- (d) Inversely proportional to N^2

Ans: (c)

4373. Theoretical power required (in watts) to drive a reciprocating pump is (where w = Specific weight of liquid to be pumped in N/m^3 , Q = Discharge of the pump in m^3/s , H_s = Suction head in metres, and H_d = Delivery head in metres)

- (a) wQH_s
- (b) wQH_d
- (c) $wQ(H_s - H_d)$
- (d) $wQ(H_s + H_d)$

Ans: (d)

4374. Slip of a reciprocating pump is negative, when

- (a) Suction pipe is short and pump is running at low speeds
- (b) Delivery pipe is long and pump is running at high speeds
- (c) Suction pipe is short and delivery pipe is long and the pump is running at low speeds
- (d) Suction pipe is long and delivery pipe is short and the pump is running at high speeds

Ans: (d)

4375. The static head of a centrifugal pump is equal to the _____ of suction head and delivery head.

- (a) Product
- (b) Difference
- (c) Sum
- (d) None of these

Ans: (c)

4376. Motion of a liquid in a volute casing of a centrifugal pump is an example of

- (a) Rotational flow
- (b) Radial
- (c) Forced spiral vortex flow
- (d) Spiral vortex flow

Ans: (d)

4377. The type of centrifugal pump preferred for a specific speed of 20 r.p.m. is

- (a) Slow speed pump with radial flow at outlet
- (b) Medium speed pump with radial flow at outlet
- (c) High speed pump with radial flow at outlet
- (d) High speed pump with axial flow at outlet

Ans: (a)

4378. Mechanical efficiency of a centrifugal pump is the ratio of

- (a) Energy available at the impeller to the energy supplied to the pump by the prime mover
- (b) Actual workdone by the pump to the energy supplied to the pump by the prime mover
- (c) Energy supplied to the pump to the energy available at the impeller
- (d) Manometric head to the energy supplied by the impeller per kN of water

Ans: (a)

- 4379.** The flow rate in gear pump
- (a) Increases with increase in pressure
 - (b) Decreases with increase in pressure
 - (c) More or less remains constant with increase in pressure
 - (d) Unpredictable

Ans: (c)

- 4380.** Which of the following statement is correct?
- (a) The centrifugal pump is suitable for large discharge and smaller heads.
 - (b) The centrifugal pump requires less floor area and simple foundation as compared to reciprocating pump.
 - (c) The efficiency of centrifugal pump is less as compared to reciprocating pump.
 - (d) All of the above

Ans: (d)

- 4381.** In a centrifugal pump, the regulating valve is provided on the
- (a) Casing
 - (b) Delivery pipe
 - (c) Suction pipe
 - (d) Impeller

Ans: (b)

- 4382.** The impeller of a centrifugal pump may have
- (a) Volute casing
 - (b) Volute casing with guide blades
 - (C) Vortex casing
 - (D) Any one of these

Ans: (d)

- 4383.** Indicator diagram of a reciprocating pump is a graph between
- (a) Flow vs. swept volume
 - (b) Pressure in cylinder vs. swept volume
 - (c) Flow vs. speed
 - (d) Pressure vs. speed

Ans: (b)

- 4384.** One horsepower is equal to
- (a) 102 watts
 - (b) 75 watts
 - (c) 550 watts
 - (d) 735 watts

Ans: (d)

- 4385.** For starting an axial flow pump, its delivery valve should be
- (a) Closed
 - (b) Open
 - (c) Depends on starting condition and flow desired
 - (d) Could be either open or closed

Ans: (b)

4386. Which of the following pump is successfully used for lifting water from deep wells?

- (a) Centrifugal pump
- (b) Reciprocating pump
- (c) Jet pump
- (d) Air lift pump

Ans: (d)

4387. When a piping system is made up primarily of friction head and very little of vertical lift, then pump characteristics should be

- (a) Horizontal
- (b) Nearly horizontal
- (c) Steep
- (d) First rise and then fall

Ans: (b)

4388. Casting of a centrifugal pump is designed so as to minimize

- (a) Friction loss
- (b) Cavitations
- (c) Static head
- (d) Loss of kinetic energy

Ans: (d)

4389. If the flow of air through the compressor is perpendicular to its axis, then it is a

- (a) Reciprocating compressor
- (b) Centrifugal compressor
- (c) Axial flow compressor
- (d) Turbo compressor

Ans: (b)

4390. A compressor mostly used for supercharging of I.C. engines is

- (a) Radial flow compressor
- (b) Axial flow compressor
- (c) Roots blower
- (d) Reciprocating compressor

Ans: (a)

4391. To avoid moisture troubles, the branch connections from compressed air lines should be taken from

- (a) Top side of main
- (b) Bottom side of main
- (c) Left side of main
- (d) Right side of main

Ans: (a)

4392. In an axial flow compressor, the ratio of pressure in the rotor blades to the pressure rise in the compressor in one stage is known as

- (a) Work factor
- (b) Slip factor
- (c) Degree of reaction

(d) Pressure coefficient

Ans: (c)

4393. To avoid moisture troubles, the compressed air main line should

- (a) Rise gradually towards the point of use
- (b) Drop gradually towards the point of use
- (c) Be laid vertically
- (d) Be laid exactly horizontally

Ans: (b)

4394. The volumetric efficiency of a compressor

- (a) Increases with decrease in compression ratio
- (b) Decreases with decrease in compression ratio
- (c) Increases with increase in compression ratio
- (d) Decreases with increase in compression ratio

Ans: (d)

4395. The capacity of compressor will be highest when its intake temperature is

- (a) Lowest
- (b) Highest
- (c) Anything
- (d) Atmospheric

Ans: (d)

4396. The volume of air sucked by the compressor during its suction stroke is called

- (a) Free air delivery
- (b) Compressor capacity
- (c) Swept volume
- (d) None of these

Ans: (c)

4397. Which is false statement about multistage compression?

- (a) Power consumption per unit of air delivered is low
- (b) Volumetric efficiency is high
- (c) It is best suited for compression ratios around 7:1
- (d) The moisture in air is condensed in the intercooler

Ans: (b)

4398. Out of the following, from where you will prefer to take intake for air compressor

- (a) From an air conditioned room maintained at 20°C
- (b) From outside atmosphere at 1°C
- (c) From coal yard side
- (d) From a side where cooling tower is located nearby

Ans: (d)

4399. When air is to be compressed at a high pressure, then it is advantageous to use

- (a) Single stage compression
- (b) Multistage compression without intercooling

- (c) Multistage compression with intercooling
- (d) None of these

Ans: (c)

4400. In multistage compressor, the isothermal compression is achieved by

- (a) Employing intercooler
- (b) By constantly cooling the cylinder
- (c) By running compressor at very slow speed
- (d) By insulating the cylinder

Ans: (c)

4401. The compressor capacity is defined as the

- (a) Actual volume of the air delivered by the compressor when reduced to normal Temperature and pressure conditions
- (b) Volume of air delivered by the compressor
- (c) Volume of air sucked by the compressor during its suction stroke
- (d) None of the above

Ans: (b)

4402. The overall isothermal efficiency of the compressor is defined as the ratio of

- (a) Work required to compress the air isothermally to the actual work required to compress the air for the same pressure ratio
- (b) Isothermal power to the shaft power or B.P. of the motor or engine required to drive the compressor
- (c) Volume of free air delivery per stroke to the swept volume of the piston
- (d) Isentropic power to the power required to drive the compressor

Ans: (b)

4403. Reciprocating air compressor is best suited for

- (a) Large quantity of air at high pressure
- (b) Small quantity of air at high pressure
- (c) Small quantity of air at low pressure
- (d) Large quantity of air at low pressure

Ans: (a)

4404. In a double acting compressor, the air is compressed

- (a) In one cylinder
- (b) In two cylinders
- (c) In a single cylinder on both sides of the piston
- (d) In two cylinders on both sides of the piston

Ans: (c)

4405. After-cooler is used to

- (a) Cool the air
- (b) Decrease the delivery temperature for ease in handling
- (c) Cause moisture and oil vapour to drop out
- (d) Reduce volume

Ans: c

4406. Which of the following statement is correct?

- (a) The reciprocating compressors are best suited for high pressure and low volume capacity
- (b) The effect of clearance volume on power consumption is negligible for the same Volume of discharge
- (c) Both (A) and (B)
- (d) None of these

Ans: (c)

4407. The reason for volumetric efficiency of reciprocating compressor being less than 100 percent is

- (a) Pressure drop across the valves
- (b) Superheating in compressor
- (c) Clearance volume and leakages
- (d) All of these

Ans: (d)

4408. Volumetric efficiency of a compressor without clearance volume

- (a) Increases with increase in compression ratio
- (b) Decreases with increase in compression ratio
- (c) Is not dependent upon compression ratio
- (d) May increase/decrease depending on compressor capacity

Ans: (c)

4409. The mean effective pressure of the compressor is the

- (a) Actual volume of the air delivered by the compressor when reduced to normal temperature and pressure conditions
- (b) Volume of air delivered by the compressor
- (c) Volume of air sucked by the compressor during its suction stroke
- (d) None of the above

Ans: (d)

4410. An ideal air compressor cycle without clearance on PV diagram can be represented by following processes

- (a) One adiabatic, two isobaric, and one constant volume
- (b) Two adiabatic and two isobaric
- (c) Two adiabatic, one isobaric and one constant volume
- (d) One adiabatic, one isobaric and two constant volumes

Ans: (a)

4411. Maximum work is done in compressing air when the compression is

- (a) Isothermal
- (b) Adiabatic
- (c) Polytropic
- (d) None of the above

Ans: (b)

4412. A rotary compressor is driven by an

- (a) Electric motor
- (b) Engine
- (c) Either (A) or (B)
- (d) None of these

Ans: (c)

4413. Isothermal compression though most efficient, but is not practicable because

- (a) It requires very big cylinder
- (b) It does not increase pressure much
- (c) It is impossible in practice
- (d) Compressor has to run at very slow speed to achieve it

Ans: (d)

4414. The ratio of work done per cycle to the swept volume in case of compressor is called

- (a) Compression index
- (b) Compression ratio
- (c) Compressor efficiency
- (d) Mean effective pressure

Ans: (d)

4415. Compression efficiency is compared against

- (a) Ideal compression
- (b) Adiabatic compression
- (c) Isentropic compression
- (d) Isothermal compression

Ans: (d)

4416. Ratio of indicated H.P. and brake H.P. is known as

- (a) Mechanical efficiency
- (b) Volumetric efficiency
- (c) Isothermal efficiency
- (d) Adiabatic efficiency

Ans: (a)

4417. The ratio of the volume of free air delivery per stroke to the swept volume of the piston, is known as

- (a) Compressor efficiency
- (b) Volumetric efficiency
- (c) Isothermal efficiency
- (d) Mechanical efficiency

Ans: (b)

4418. Clearance volume in actual reciprocating compressors is essential

- (a) To accommodate Valves in the cylinder head
- (b) To provide cushioning effect
- (c) To attain high volumetric efficiency
- (d) To provide cushioning effect and also to avoid mechanical bang of piston with cylinder head

Ans: (d)

- 4419.** The overall efficiency of the compressed air system is the
- (a) Ratio of shaft output of the air motor to the shaft input to the compressor
 - (b) Ratio of shaft input to the compressor to the shaft output of air motor
 - (c) Product of shaft output of air motor and shaft input to the compressor
 - (d) None of the above

Ans: (a)

- 4420.** Adiabatic compression is one in which
- (a) Temperature during compression remains constant
 - (b) No heat leaves or enters the compressor cylinder during compression
 - (c) Temperature rise follows a linear relationship
 - (d) Work done is maximum

Ans: (b)

- 4421.** A machine used to raise the pressure of air is called
- (a) Gas turbine
 - (b) I.C engine
 - (c) Compressor
 - (d) Air motor

Ans: (c)

- 4422.** The overall isothermal efficiency of compressor is defined as the ratio of
- (a) Isothermal h.p. to the BHP of motor
 - (b) Isothermal h.p. to adiabatic h.p.
 - (c) Power to drive compressor to isothermal h.p.
 - (d) Work to compress air isothermally to work for actual compression

Ans: (a)

- 4423.** In a centrifugal compressor, the ratio of the _____ to the blade velocity is called slip factor.
- (a) Inlet whirl velocity
 - (b) Outlet whirl velocity
 - (c) Inlet velocity of flow
 - (d) Outlet velocity of flow

Ans: (d)

- 4424.** The most efficient method of compressing air is to compress it
- (a) Isothermally
 - (b) Adiabatically
 - (c) Isentropically
 - (d) Isochronically

Ans: (a)

- 4425.** The performance of air compressor at high altitudes will be _____ as compared to that at sea level.
- (a) Same
 - (b) Lower

- (c) Higher
- (d) None of these

Ans: (b)

- 4426.** The pressure and temperature conditions of air at the suction of compressor are
- (a) Atmospheric
 - (b) Slightly more than atmospheric
 - (c) Slightly less than atmospheric
 - (d) Pressure slightly less than atmospheric and temperature slightly more than atmospheric

Ans: (d)

- 4427.** Which of the following statement is correct as regard to centrifugal compressors?
- (a) The flow of air is parallel to the axis of the compressor
 - (b) The static pressure of air in the impeller increases in order to provide centripetal Force on the air
 - (c) The impeller rotates at high speeds
 - (d) The maximum efficiency is higher than multistage axial flow compressors

Ans: (b)

- 4428.** Isothermal compression efficiency can be attained by running the compressor
- (a) At very high speed
 - (b) At very slow speed
 - (c) At average speed
 - (d) At zero speed

Ans: (b)

- 4429.** The capacity of a compressor is expressed in
- (a) kg/m^2
 - (b) kg/m^3
 - (c) m^3/min
 - (d) m^3/kg

Ans: (c)

- 4430.** Cylinder clearance in a compressor should be
- (a) As large as possible
 - (b) As small as possible
 - (c) About 50% of swept volume
 - (d) About 100% of swept volume

Ans: (b)

- 4431.** The ratio of work done per cycle to the stroke volume of the compressor is known as
- (a) Compressor capacity
 - (b) Compression ratio
 - (c) Compressor efficiency
 - (d) Mean effective pressure

Ans: (d)

4432. The net work input required for compressor with increase in clearance volume

- (a) Increases
- (b) Decreases
- (c) Remains same
- (d) Increases/decreases depending on compressor capacity

Ans: (c)

4433. For minimum work required to compress and deliver a quantity of air by multistage compression

- (a) The compression ratio in each stage should be same
- (b) The intercooling should be perfect
- (c) The work done in each stage should be same
- (d) All of the above

Ans: (d)

4434. Volumetric efficiency of a compressor with clearance volume

- (a) Increases with increase in compression ratio
- (b) Decreases with increase in compression ratio
- (c) In not dependent upon compression ratio
- (d) May increase/decrease depending on compressor capacity

Ans: (b)

4435. Rotary compressor is best suited for

- (a) Large quantity of air at high pressure
- (b) Small quantity of air at high pressure
- (c) Small quantity of air at low pressure
- (d) Large quantity of air at low pressure

Ans: (b)

4436. The thrust on the rotor in a centrifugal compressor is produced by

- (a) Radial component
- (b) Axial component
- (c) Tangential component
- (d) None of the above

Ans: (b)

4437. A compressor at high altitude will draw

- (a) More power
- (b) Less power
- (c) Same power
- (d) More/less power depending on other factors

Ans: (b)

4438. The temperature of air at the beginning of the compression stroke is ____ the atmospheric temperature.

- (a) Equal to
- (b) Less than
- (c) More than

(d) None of these

Ans: (c)

4439. Carbon arc lamps are commonly used in

- (a) photography
- (b) cinema projectors
- (c) domestic lighting
- (d) street lighting

Ans: (b)

4440. The purpose of coating the fluorescent tube from inside with white powder is

- (a) to improve its life
- (b) to improve the appearance
- (c) to change the colour of light emitted to white
- (d) to increase the light radiations due to secondary emissions

Ans: d

4441. Among the following ____ will need the lowest level of illumination.

- (a) auditoriums
- (b) railway platform
- (c) displays
- (d) fine engravings

Ans: (b)

4442. Which of the following instruments is used for the comparison of candle powers of different sources?

- (a) R radiometer
- (b) Bunsen meter
- (c) photometer
- (d) candle meter

Ans: (c)

4443. In the fluorescent tube circuit the function of choke is primarily to

- a. reduce the flicker
- b. minimise the starting surge
- c. initiate the arc and stabilize it
- d. reduce the starting current

Ans: C

4444. The function of capacitor across the supply to the fluorescent tube is primarily to

- a. stabilize the arc
- b. reduce the starting current
- c. improve the supply power factor
- d. reduce the noise

Ans: C

4445. Most affected parameter of a filament lamp due to voltage change is

- a. wattage
- b. life
- c. luminous efficiency
- d. light output

Ans: B

4446. In electric discharge lamps for stabilizing the arc

- a. a reactive choke is connected in series with the supply
- b. a condenser is connected in series to the supply
- c. a condenser is connected in parallel to the supply
- d. a variable resistor is connected in the

circuit **Ans: A**

f) Illumination

4447. Carbon arc lamps are commonly used in

- (a) Domestic lighting
- (b) Street lighting
- (c) Cinema projector
- (d) Photography

Ans: (c)

4448. Which of the following lamp gives nearly monochromatic light?

- (a) Sodium vapor lamp
- (b) GLS lamp
- (c) Tube light
- (d) Mercury vapor lamp

Ans: (a)

4449. Sodium Vapour Lamp is used in

- (a) Homes
- (b) Street lights
- (c) Battery Charging
- (d) Hotels

Ans: (b)

4450. Which of the following other than Mercury is filled in HPMV lamps?

- (a) Argon
- (b) Hydrogen
- (c) Nitrogen
- (d) Krypton

Ans: (a)

4451. Which of the following has the least power consumption?

- (a) Tubelight
- (b) Argon Bulb
- (c) CFL tubes
- (d) LED bulbs

Ans: (d)

4452. If the candle power is 45cd, then how much flux will be emitted by this source?

- (a) 565.2 lumens
- (b) 764 lumens
- (c) 0.00725 lumens
- (d) 9.20 lumens

Ans: (a)

4453. Candela is the unit of ---

- (a) Luminous flux
- (b) Luminous intensity
- (c) Wavelength
- (d) Frequency

Ans: (b)

4454. Fluorescent material Zinc Silicate used in Fluorescent tubes gives colour

- (a) Green
- (b) Yellow
- (c) Pinkish White
- (d) Blackish grey

Ans: (a)

4455. Which lamp/s does not have separate choke?

- (i) Sodium vapour lamp
- (ii) Fluorescent lamp
- (iii) Mercury vapour lamp
- (a) Only (i)
- (b) Only (ii)
- (c) (i) and (ii)
- (d) (ii) and (iii)

Ans: (a)

4456. Filament lamps operate normally at a power factor of

- (a) 0.5 lagging
- (b) 0.8 lagging
- (c) Unity
- (d) 0.8 leading

Ans: (c)

4457. Illumination of one lumen per sq. metre is called

- (a) Foot candle
- (b) Candela
- (c) Lumen metre
- (d) Lux

Ans: (d)

4458. Speed of lights is

- (a) 3×10^{12}
cm/sec
- (b) 3×10^8
cm/sec
- (c) 3×10^8 m/sec
- (d) 332 m/sec

Ans:

(c)

4459. One lux is

- (a) 1 lumen/mt²
- (b) 4π lumen/mt²
- (c) 1 lumen/mt
- (d) 1 candela

Ans: (a)

4460. Efficiency of light source is

- (a) Lumen/watt
- (b) Watt/lumen
- (c) Radiated flux x 100/4 lt
- (d) None of the above

Ans: (a)

4461. Visible light's wavelength range is

- (a) 0.39 - 0.77 nm
- (b) 0.39 - 0.77 μ m
- (c) 0.39 - 0.77 mm
- (d) 0.39 - 0.77 cm

Ans: (b)

4462. The laser produced from stimulated emission has the following characteristics

- (a) Monochromatic
- (b) Coherent
- (c) Very narrow and collimated ray
- (d) All of these

Ans: (d)

4463. A lamp produces average 25 C.P. The total flux produces by the lamp is

- (a) 314 lumen
- (b) 350 lumen
- (c) 214 lumen
- (d) 300 lumen

Ans: (a)

4464. In gas discharge lamp which of the following metal vapour is filled.

- (a) lithium
- (b) mercury
- (c) zinc

(d) silver

Ans: (b)

4465. Which of the following place will require high level of illumination.

- (a) Sewing class room
- (b) Fine assemble work in industry
- (c) Show rooms in shopping malls
- (d) Drawing offices

Ans: (b)

4466. In a fluorescent lamp circuit the function of the capacitor connected across the supply is to

- (a) improve the power factor
- (b) reduce radio interference
- (c) produce high voltage to initiate arc/ Arc
- (d) limit starting current

Ans: (a)

4467. Which of the following vapour/gas will give yellow colour?

- (a) Helium
- (b) Mercury
- (c) Sodium
- (d) Magnesium

Ans: (c)

4468. If the distance between the light source and the surface is reduced to half, the illumination on the surface will

- (a) Reduce to half of the original
- (b) Reduce to one fourth of the original
- (c) Increase to double of the original
- (d) Increase to four times of the original

Ans: (d)

4469. The ratio of lumens in the beam of a projector to the lumens given out by lamps is called the

- (a) Beam factor
- (b) Luminance
- (c) Power factor
- (d) None of the above

Ans: (a)

4470. In which type of lightning systems 90-100% of the light is directed downwards and 0-10% of the light upwards

- (a) Semi direct
- (b) Diffusing
- (c) Direct Lighting
- (d) Indirect Lighting

Ans: (c)

4471. In tubelight choke work on the principle of

- (a) bi-metallic
- (b) capacitance
- (c) inductance
- (d) ionization

Ans: (c)

4472. Illumination is measured by which of the following

- (a) Millivoltmeter
- (b) Straboscope
- (c) Luxmeter
- (d) pH meter

Ans: (c)

4473. Which type of lighting system is usually employed in cinema, dancing halls and decoration in hotels?

- (a) Indirect Lighting System
- (b) Semi-Direct Lighting System
- (c) Direct Lighting System
- (d) Semi-Indirect Lighting System

Ans: (a)

4474. In a Sodium Vapour Lamp.

1. Both Sodium and Neon are filled.
2. Gas discharge take place.
3. Light exhibited is Yellow in colour.

Which of the given statements is correct?

- (a) 1, 2 and 3 are correct
- (b) Only 2 is correct
- (c) None is correct
- (d) 1 and 2 are correct

Ans: (a)

4475. A bulb produces an average illumination of 70 CP. What will be the total flux generated by it?

- (a) 700 lumen
- (b) 314 lumen
- (c) 350 lumen
- (d) 880 lumen

Ans: (d)

4476. In a Gas Discharge Lamp, vapours of are also filled along with a Noble gas.

- (a) Lithium or Helium
- (b) Barium
- (c) Sodium or Mercury
- (d) Helium

Ans: (c)

4477. Which of the following statements is not true?

- (a) The unit of brightness is Candel per sq. metre
- (b) Candela is the SI unit of Luminous Intensity
- (c) The value of utilization is for direct light is generally 0.4-0.6
- (d) CFL consumes a lot of electricity

Ans: (d)

4478. The colour having shortest wavelength in the following is

- (a) Yellow
- (b) Blue
- (c) Orange
- (d) Green

Ans: (b)

4479. For the same wattage which lamp will produce least radiant heat?

- (a) Mercury Vapour lamp
- (b) Sodium vapour lamp
- (c) Fluorescent lamp
- (d) Tungsten Filament Lamp

Ans: (c)

4480. Which of the following statements is not true regarding a CFL?

- (a) Its light produce a cooling effect
- (b) A 18 watt CFL produces illumination equivalent to a 100 W incandescent lamp
- (c) It consumes a lot of electricity
- (d) An electronic circuit is used for high starting

Ans: (c)

4481. In LEDs, light is emitted when -----

- (a) Electrons recombine with electrons
- (b) Electrons recombine with holes
- (c) Electrons do not recombine
- (d) None of the above

Ans: (b)

4482. Which of the following produce the current when it absorbs photons?

- (a) Transducer
- (b) LED
- (c) Photodiode
- (d) LCD

Ans: (c)

4483. The vapour discharge tube used for domestic light has

- (a) one filament.
- (b) two filaments.
- (c) four filaments.
- (d) no filament.

Ans: (b)

4484. The function of capacitor across the supply to the fluorescent tube is primarily to

- (a) stabilize the arc
- (b) reduce the starting current
- (c) improve the supply power factor
- (d) reduce the noise

Ans: (c)

4485. When a fluorescent lamp is to be operated on D.C. which of the following additional devices must be incorporated in the circuit?

- (a) Inductance
- (b) transformer
- (c) resistance
- (d) condenser

Ans: (c)

4486. The level of illumination on a surface least depends on

- (a) ambient temperature
- (b) candle power of the source
- (c) distance of the source
- (d) type of reflector used

Ans: (a)

4487. Which of the following is present inside the fluorescent tube?

- (a) argon and neon
- (b) argon and CO₂
- (c) mercury vapour
- (d) helium and oxygen

Ans: (c)

4488. In case of ____ power factor is the highest.

- (a) GLS lamps
- (b) mercury arc lamps
- (c) tube lights
- (d) sodium vapour lamps

Ans: (a)

4489. The fluorescent tube is coated from inside with a thin layer of fluorescent material in the form of powder in order to

- (a) absorb invisible ultraviolet rays and radiate visible rays.
- (b) improve the appearance.
- (c) reduce glare.
- (d) improve life.

Ans: (a)

4490. Which of the following lamps is a cold cathode lamp ?

- (a) Sodium vapour lamp.
- (b) Neon lamp.
- (c) Mercury vapour lamp.
- (d) None of the above.

Ans: (b)

4491. The lamp that cannot be used for dimming is

- (a) cold cathode lamp.
- (b) fluorescent lamp.
- (c) GLS lamp.
- (d) all of the above.

Ans: (b)

4492. The lamp that causes radio-interference is

- (a) fluorescent tube.
- (b) halogen lamp.
- (c) mercury vapour lamp.
- (d) all of the above.

Ans: (a)

4493. Radio-interference from a fluorescent tube can be reduced by

- (a) eliminating choke.
- (b) connecting a small capacitor across starter terminals.
- (c) putting two tubes in parallel.
- (d) any of the above.

Ans: (b)

4494. Sometimes the wheels of the rotating machinery, in fluorescent tube lighting, appear to be stationary . This is due to

- (a) luminescence effect.
- (b) light fluctuations.
- (c) stroboscopic effect.
- (d) all of the above.

Ans: (c)

4495. A mercury vapour lamp gives _light.

- (a) white
- (b) pink
- (c) yellow
- (d) greenish blue

Ans: (d)

g) Electrical Measuring Equipments

4496. The use of _____ instrument is merely confined within laboratories as standardizing instruments.

- a) Absolute
- b) Indicating
- c) Recording
- d) Integrating

Ans: a

4498. Which of the following instruments indicate the instantaneous value of the electrical quantity

- A. Absolute instruments
- B. Indicating instruments
- C. Recording instruments
- D. Integrating instruments

Ans: b

4501. _____ instruments are those which measure the total quantity of electricity delivered in a particular time.

- A. Absolute
- B. Indicating
- C. Recording
- D. Integrating

Ans: d

4503. Which of the following are integrating instruments?

- A. Ammeters
- B. Voltmeters
- C. Wattmeters
- D. Ampere-hour and watt-hour meters

Ans: d

4505. Resistances can be measured with the help of

- A. (a) wattmeters
- B. (b) voltmeters
- C. (c) ammeters
- D. (d) ohmmeters and resistance bridges
- E. (e) all of the above

Ans: d

4507. According to application, instruments are classified as

- A. (a) switch board
- B. (b) portable
- C. (c) both (a) and (b)
- D. (d) moving coil
- E. (e) moving iron
- F. (f) both (d) and (e)

Ans: c

4509. Which of the following essential features is possessed by an indicating instrument?

- A. (a) Deflecting device
- B. (b) Controlling device
- C. (c) Damping device
- D. (d) All of the above

Ans: d

4511. A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly

- A. (a) deflecting
- B. (b) controlling
- C. (c) damping
- D. (d) any of the above

Ans: c

4514. The spring material used in a spring control device should have the following property.

- A. (a) Should be non-magnetic
- B. (b) Must be of low temperature co-efficient
- C. (c) Should have low specific resistance
- D. (d) Should not be subjected to fatigue
- E. (e) All of the above

Ans: e

4516. Which of the following properties a damping oil must possess?

- A. (a) Must be a good insulator
- B. (b) Should be non-evaporating
- C. (c) Should not have corrosive action upon the metal of the vane
- D. (d) The viscosity of the oil should not change with the temperature
- E. (e) All of the above

Ans: e

4518. A moving-coil permanent-magnet instrument can be used as _____ by using a low resistance shunt.

- A. (a) ammeter
- B. (b) voltmeter
- C. (c) flux-meter
- D. (d) ballistic galvanometer

Ans: a

4520. A moving-coil permanent-magnet instrument can be used as flux-meter

- A. (a) by using a low resistance shunt
- B. (b) by using a high series resistance
- C. (c) by eliminating the control springs
- D. (d) by making control springs of large moment of inertia

Ans: c

4522. Which of the following devices may be used for extending the range of instruments?

- A. (a) Shunts
- B. (b) Multipliers
- C. (c) Current transformers
- D. (d) Potential transformers
- E. (e) All of the above

Ans: e

4524. An induction meter can handle current upto

- A. (a) 10 A
- B. (b) 30 A
- C. (c) 60 A
- D. (d) 100 A

Ans: d

4526. For handling greater currents induction wattmeters are used in conjunction with

- A. (a) potential transformers
- B. (b) current transformers
- C. (c) power transformers
- D. (d) either of the above
- E. (e) none of the above

Ans: b

4528. Induction type single phase energy meters measure electric energy in

- A. (a) kW
- B. (b) Wh
- C. (c) kWh
- D. (d) VAR
- E. (e) None of the above
- F. **Ans: c**

4530. Most common form of A.C. meters met with in every day domestic and industrial installations are

- (a) mercury motor meters
- (b) commutator motor meters
- (c) induction type single phase energy meters
- (d) all of the above

Ans: c

4532. Which of the following meters are not used on D.C. circuits

- (a) Mercury motor meters
- (b) Commutator motor meters
- (c) Induction meters
- (d) None of the above

Ans: c

4534. Which of the following is an essential part of a motor meter?

- (a) An operating torque system
- (b) A braking device
- (c) Revolution registering device
- (d) All of the above

Ans: d

4536. A potentiometer may be used for

- (a) measurement of resistance
- (b) measurement of current
- (c) calibration of ammeter
- (d) calibration of voltmeter
- (e) all of the above

Ans: e

4538. is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another,

- (a) Tangent galvanometer
- (b) Meggar
- (c) Current transformer
- (d) None of the above

Ans: b

4541. The household energy meter is

- (a) an indicating instrument
- (b) a recording instrument
- (c) an integrating instrument
- (d) none of the above

Ans: c

4543. The pointer of an indicating instrument should be

- (a) very light
- (b) very heavy
- (c) either (a) or (b)
- (d) neither (a) nor (b)

Ans: a

4545. The chemical effect of current is used in

- (a) D.C. ammeter hour meter
- (b) D.C. ammeter
- (c) D.C. energy meter
- (d) none of the above

Ans: a

4547. In majority of instruments damping is provided by

- (a) fluid friction
- (b) spring
- (c) eddy currents
- (d) all of the above

Ans: c

4549. An ammeter is a

- (a) secondary instrument
- (b) absolute instrument
- (c) recording instrument
- (d) integrating instrument

Ans: a

4551. In a portable instrument, the controlling torque is provided by

- (a) spring
- (b) gravity
- (c) eddy currents
- (d) all of the above

Ans: a

4553. The disc of an instrument using eddy current damping should be of

- (a) conducting and magnetic material
- (b) non-conducting and magnetic material
- (c) conducting and non-magnetic material
- (d) none of the above

Ans: c

4555. The switch board instruments

- (a) should be mounted in vertical position
- (b) should be mounted in horizontal position
- (c) either (a) or (b)
- (d) neither (a) nor (b)

Ans: a

4560. The function of shunt in an ammeter is to

- (a) by pass the current
- (b) increase the sensitivity of the ammeter
- (c) increase the resistance of ammeter
- (d) none of the above

Ans: a

4562. The multiplier and the meter coil in a voltmeter are in

- (a) series
- (b) parallel
- (c) series-parallel
- (d) none of the above

Ans: a

4564. A moving iron instrument can be used for

- (a) D.C. only
- (b) A.C. only
- (c) both D.C. and A.C.

Ans: c

4566. The scale of a rectifier instrument is

- (a) linear
- (b) non-linear
- (c) either (a) or (b)

(d) neither (a) nor (b)

Ans: a

4568. For measuring current at high frequency we should use

- (a) moving iron instrument
- (b) electrostatic instrument
- (c) thermocouple instrument
- (d) none of the above

Ans: c

4570. The resistance in the circuit of the moving coil of a dynamometer wattmeter should be

- (a) almost zero
- (b) low
- (c) high
- (d) none of the above

Ans: c

4572. A dynamometer wattmeter can be used for

- (a) both D.C. and A.C.
- (b) D.C. only
- (c) A.C. only
- (d) any of the above

Ans: a

4574. An induction wattmeter can be used for

- (a) both D.C. and A.C.
- (b) D.C. only
- (c) A.C. only
- (d) any of the above

Ans: b

4579. The pressure coil of a wattmeter should be connected on the supply side of the current coil when

- (a) load impedance is high
- (b) load impedance is low
- (c) supply voltage is low
- (d) none of the above

Ans: a

4582. In a low power factor wattmeter the pressure coil is connected

- (a) to the supply side of the current coil
- (b) to the load side of the current coil
- (c) in any of the two meters at connection
- (d) none of the above

Ans: b

4584. In a low power factor wattmeter the compensating coil is connected

- (a) in series with current coil
- (b) in parallel with current coil
- (c) in series with pressure coil
- (d) in parallel with pressure coil

Ans: c

4586. In a 3-phase power measurement by two wattmeter method, both the watt meters had identical readings. The power factor of the load was

- (a) unity
- (b) 0.8 lagging
- (c) 0.8 leading
- (d) zero

Ans: a

4592. In a 3-phase power measurement by two wattmeter method the reading of one of the wattmeter was zero. The power factor of the load must be

- (a) unity
- (b) 0.5
- (c) 0.3
- (d) zero

Ans: b

4595. The adjustment of position of shading bands, in an energy meter is done to provide

- (a) friction compensation
- (b) creep compensation
- (c) braking torque
- (d) none of the above

Ans: a

4597. An ohmmeter is a

- (a) moving iron instrument
- (b) moving coil instrument
- (c) dynamometer instrument
- (d) none of the above

Ans: b

4599. When a capacitor was connected to the terminal of ohmmeter, the pointer indicated a low resistance initially and then slowly came to infinity position. This shows that capacitor is

- (a) short-circuited
- (b) all right
- (c) faulty

Ans: b

4602. For measuring a very high resistance we should use

- (a) Kelvin's double bridge
- (b) Wheat stone bridge
- (c) Meggar
- (d) None of the above

Ans: c

4604. The electrical power to a megger is provided by

- (a) battery
- (b) permanent magnet D.C. generator
- (c) AC. generator
- (d) any of the above

Ans: b

4606. In a megger controlling torque is provided by

- (a) spring
- (b) gravity
- (c) coil
- (d) eddy current

Ans: c

4608. The operating voltage of a meggar is about

- (a) 6 V
- (b) 12 V
- (c) 40 V
- (d) 100 V

Ans: d

4610. Murray loop test can be used for location of

- (a) ground fault on a cable
- (b) short circuit fault on a cable
- (c) both the ground fault and the short-circuit fault
- (d) none of the above

Ans: c

4612. Which of the following devices should be used for accurate measurement of low D.C. voltage ?

- (a) Small range moving coil voltmeter
- (b) D.C. potentiometer
- (c) Small range thermocouple voltmeter
- (d) None of the above

Ans: b

4615. It is required to measure the true open circuit e.m.f. of a battery. The best device is

- (a) D.C. voltmeter
- (b) Ammeter and a known resistance
- (c) D.C. potentiometer
- (d) None of the above

Ans: c

4617. A voltage of about 200 V can be measured

- (a) directly by a D.C. potentiometer
- (b) a D.C. potentiometer in conjunction with a volt ratio box
- (c) a D.C. potentiometer in conjunction with a known resistance
- (d) none of the above

Ans: b

4619. A direct current can be measured by

- (a) a D.C. potentiometer directly
- (b) a D.C. potentiometer in conjunction with a standard resistance
- (c) a D.C. potentiometer in conjunction with a volt ratio box
- (d) none of the above

Ans: b

4621. To measure a resistance with the help of a potentiometer it is

- (a) necessary to standardise the potentiometer
- (b) not necessary to standardise the potentiometer
- (c) necessary to use a volt ratio box in conjunction with the potentiometer

(d) none of the above

Ans: b

4623. A phase shifting transformer is used in conjunction with

- (a) D.C. potentiometer
- (b) Drysdale potentiometer
- (c) A.C. co-ordinate potentiometer
- (d) Crompton potentiometer

Ans: b

4625. Basically a potentiometer is a device for

- (a) comparing two voltages
- (b) measuring a current
- (c) comparing two currents
- (d) measuring a voltage
- (e) none of the above

Ans: a

4627. In order to achieve high accuracy, the slide wire of a potentiometer should be

- (a) as long as possible
- (b) as short as possible
- (c) neither too small not too large
- (d) very thick

Ans: a

4629. To measure an A. C. voltage by using an A.C. potentiometer, it is desirable that the supply for the potentiometer is taken

- (a) from a source which is not the same as the unknown voltage
- (b) from a battery
- (c) from the same source as the unknown voltage
- (d) any of the above

Ans: c

4632. The stator of phase shifting transformer for use in conjunction with an A.C. potentiometer usually has a

- (a) single-phase winding
- (b) two-phase winding
- (c) three-phase winding
- (d) any of the above

Ans: b

4635. In an AC. co-ordinate potentiometer, the currents in the phase and quadrature potentiometer are adjusted to be

- (a) out of phase by 90°
- (b) out of phase by 60°
- (c) out of phase by 30°
- (d) out of phase by 0°
- (e) out of phase by 180°

Ans: a

4642. A universal RLC bridge uses

- (a) Maxwell bridge configuration for measurement of inductance and De Santas bridge for measurement of capacitance
- (b) Maxwell Wein bridge for measurement of inductance and modified De Santy's bridge for measurement of capacitance
- (c) Maxwell Wein bridge for measurement of inductance and Wein bridge for measurement of capacitance
- (d) Any of the above.

Ans: b

4650. For measurements on high voltage capacitors, the suitable bridge is

- (a) Wein bridge
- (b) Modified De Santy's bridge
- (c) Schering bridge
- (d) Any of the above
- (e) None of the above

Ans: c

4652. In an Anderson bridge, the unknown inductance is measured in terms of

- (a) known inductance and resistance
- (b) known capacitance and resistance
- (c) known resistance
- (d) known inductance

Ans: b

4654. Wagner earthing device is used to eliminate errors due to

- (a) electrostatic coupling
- (b) electromagnetic coupling
- (c) both (a) and (b)
- (d) none of the above

Ans: a

SPECIFIC APPLICATION IN SHOP AREA

a) Operation of on-load tap changer

4655. What is the primary function of an On-Load Tap Changer (OLTC)?

- A) To change the frequency of the electrical supply
- B) To regulate the output voltage under load conditions
- C) To disconnect the load during voltage adjustment
- D) To reduce power consumption

Answer: B) To regulate the output voltage under load conditions

4656. Where is the On-Load Tap Changer (OLTC) typically installed?

- A) In the generator unit
- B) In the transformer primary side
- C) In the secondary of a transformer
- D) In the power lines

Answer: C) In the secondary of a transformer

4657. What type of contact does an OLTC use to ensure uninterrupted voltage regulation?

- A) Vacuum contact
- B) Arcing contact
- C) Oil-filled contact
- D) Air-break contact

Answer: C) Oil-filled contact

4658. What is the typical mechanism used in OLTC to change the tap position under load?

- A) A motor-driven mechanism
- B) Manual operation
- C) Magnetic levitation
- D) Hydraulic pressure

Answer: A) A motor-driven mechanism

4659. Which of the following is a major advantage of using an OLTC?

- A) It can regulate voltage without interrupting the load
- B) It requires frequent maintenance
- C) It is cheaper than a conventional tap changer
- D) It cannot be operated under load

Answer: A) It can regulate voltage without interrupting the load

4660. What is the principle of operation of an On-Load Tap Changer?

- A) By changing the primary winding of the transformer
- B) By adjusting the number of turns in the secondary winding under load
- C) By altering the magnetic field in the transformer core

D) By changing the frequency of the supply voltage

Answer: B) By adjusting the number of turns in the secondary winding under load

4661. Which component of the OLTC system helps to reduce the arc when changing taps?

- A) Arcing contacts
- B) Tap selector switch
- C) Tap changer drive
- D) Surge arrester

Answer: A) Arcing contacts

4662. What is the role of the tap changer drive mechanism in OLTC operation?

- A) To open and close the arcing contacts
- B) To move the contacts to a new tap position
- C) To regulate the cooling system of the transformer
- D) To monitor the output voltage

Answer: B) To move the contacts to a new tap position

4663. What is the common oil used in the OLTC for insulation and cooling?

- A) Silicone oil
- B) Mineral oil
- C) Transformer oil
- D) Synthetic oil

Answer: C) Transformer oil

4664. How does the OLTC ensure that voltage regulation occurs smoothly without arcing?

- A) By using a vacuum in the switching chamber
- B) By switching only when the transformer is not under load
- C) By gradually shifting to the new tap position
- D) By using gas-filled contacts

Answer: C) By gradually shifting to the new tap position

4665. What happens when the OLTC contacts make a poor connection during operation?

- A) It may cause sparking and damage to the transformer
- B) It will improve voltage regulation
- C) It will prevent the transformer from overheating
- D) It will increase the efficiency of voltage regulation

Answer: A) It may cause sparking and damage to the transformer

4666. Which of the following is true about the OLTC operation?

- A) The operation of OLTC requires load shedding
- B) OLTC can be operated manually during emergencies
- C) OLTC is always fully automated and requires no manual intervention
- D) OLTC can only be operated at no-load conditions

Answer: B) OLTC can be operated manually during emergencies

4667. Which of the following protection is commonly used in OLTC to prevent overcurrent?

- A) Differential protection relay
- B) Overcurrent protection relay
- C) Earth fault relay
- D) Surge protection relay

Answer: B) Overcurrent protection relay

4668. In an OLTC system, what function does the motor-driven operation serve?

- A) To cool down the transformer
- B) To shift the tap changer contacts to different positions
- C) To monitor the voltage levels
- D) To detect faults in the transformer

Answer: B) To shift the tap changer contacts to different positions

4669. What is a typical consequence of not maintaining the OLTC properly?

- A) Continuous voltage regulation under all conditions
- B) Loss of load without proper regulation
- C) Frequent interruptions in power supply
- D) Increased transformer efficiency

Answer: B) Loss of load without proper regulation

4670. What is the typical range of voltage that an OLTC can regulate in a transformer?

- A) 5% to 10%
- B) 0% to 20%
- C) 5% to 50%
- D) 10% to 40%

Answer: A) 5% to 10%

4671. Which type of transformer uses OLTC for voltage regulation?

- A) Step-up transformer
- B) Step-down transformer
- C) Auto transformer
- D) Both A and B

Answer: D) Both A and B

4672. What is the main reason for implementing an OLTC in the electrical system?

- A) To reduce the power loss in the transformer
- B) To provide a stable voltage output under varying load conditions
- C) To increase the transformer's power rating
- D) To improve the frequency stability of the transformer

Answer: B) To provide a stable voltage output under varying load conditions

4673. What type of maintenance is generally required for OLTCs?

- A) Routine cleaning and oil replacement
- B) Complete overhaul every year
- C) Only visual inspections
- D) No maintenance is required

Answer: A) Routine cleaning and oil replacement

4674. What is used to switch the taps in the OLTC under load conditions?

- A) Mechanical switches
- B) Mercury switches
- C) Motorized switches with arcing contacts
- D) Oil-filled switches

Answer: C) Motorized switches with arcing contacts

4675. What causes the tap changer to operate in steps?

- A) It is controlled by a manual setting
- B) It operates based on a frequency change
- C) The transformer load determines the steps
- D) The design of the OLTC limits the step operation for smooth voltage regulation

Answer: D) The design of the OLTC limits the step operation for smooth voltage regulation

4676. What happens when the tap changer switches between positions?

- A) There is a sudden change in voltage
- B) There is no change in the voltage
- C) There is a gradual adjustment of the voltage
- D) The load is completely disconnected for a brief moment

Answer: C) There is a gradual adjustment of the voltage

4677. Which of the following is a common issue in OLTC operation?

- A) Overheating due to poor maintenance
- B) Sudden loss of voltage regulation
- C) Failure to provide sufficient cooling
- D) Inconsistent switching between tap positions

Answer: A) Overheating due to poor maintenance

4678. How does the OLTC prevent excessive arcing during tap changes?

- A) By using oil or gas in the contacts
- B) By reducing the voltage to zero
- C) By employing solid-state switches
- D) By cooling the transformer with a heat exchanger

Answer: A) By using oil or gas in the contacts

4679. How often should the oil in the OLTC be changed?

- A) Every 6 months
- B) Every 1 year
- C) As per the manufacturer's recommendation (typically every 3-5 years)
- D) Once during the lifetime of the transformer

Answer: C) As per the manufacturer's recommendation (typically every 3-5 years)

4680. What kind of protective relays are used in the OLTC?

- A) Overcurrent and short-circuit relays
- B) Differential protection relays
- C) Overload relays
- D) A combination of overcurrent and earth fault relays

Answer: A) Overcurrent and short-circuit relays

4681. What can happen if the OLTC contacts experience high wear and tear?

- A) The transformer will become more efficient
- B) Voltage regulation may become unreliable
- C) The transformer will operate at a lower temperature
- D) The efficiency of voltage regulation increases

Answer: B) Voltage regulation may become unreliable

4682. What is the typical life span of an OLTC system before significant maintenance or replacement is needed?

- A) 5-10 years
- B) 15-25 years
- C) 30-40 years
- D) 10-15 years

Answer: B) 15-25 years

4683. What type of controller is typically used in OLTC to monitor tap change operations?

- A) Microprocessor-based controller
- B) Mechanical switch
- C) Digital relay
- D) Current relay

Answer: A) Microprocessor-based controller

4684. What is used to monitor and control the tap changer motor?

- A) Speed sensor
- B) Voltage regulator
- C) Control panel with feedback system
- D) Manual override switch

Answer: C) Control panel with feedback system

b) HT and LT Layout of MRS

4685. What does HT stand for in the context of electrical power distribution?

- A) High Technology
- B) High Tension
- C) High Transmission
- D) High Tracing

Answer: B) High Tension

4686. What is the main function of the Main Receiving Station (MRS) in Rail Wheel Factory?

- A) To distribute electricity to sub-stations
- B) To transform high voltage to low voltage for machinery
- C) To store electricity for future use
- D) To monitor the power quality

Answer: A) To distribute electricity to sub-stations & B) To transform high voltage to low voltage for machinery

4687. What is the typical voltage range for HT incoming feeders in a Rail Wheel Factory?

- A) 110V to 230V
- B) 415V to 660V
- C) 11kV to 33kV
- D) 400kV to 600kV

Answer: C) 11kV to 33kV

4688. The high-tension side of the transformer steps down the voltage from:

- A) 440V to 110V
- B) 11kV/33kV to 415V/660V
- C) 380V to 220V
- D) 660V to 110V

Answer: B) 11kV/33kV to 415V/660V

4689. What is the typical voltage for low-tension (LT) systems in industrial settings like the Rail Wheel Factory?

- A) 11kV
- B) 33kV
- C) 415V/660V
- D) 1000V

Answer: C) 415V/660V

4690. Which of the following is used for switching and protecting circuits in the HT system of an MRS?

- A) Circuit Breaker
- B) Transformer
- C) Fuse
- D) Isolation switch

Answer: A) Circuit Breaker

4691. What is the purpose of the step-down transformer in the MRS?

- A) To convert AC to DC
- B) To increase the voltage for transmission
- C) To reduce the voltage to a usable level for machinery
- D) To regulate the power factor

Answer: C) To reduce the voltage to a usable level for machinery

4692. In an electrical distribution system, what does the 'busbar' do?

- A) Directly converts electrical power
- B) Provides a physical path for current flow and connects circuits
- C) Protects circuits from overload
- D) Stores excess power for later use

Answer: B) Provides a physical path for current flow and connects circuits

4693. What protection device is commonly used to protect electrical circuits from overcurrent on the HT side?

- A) Fuse
- B) Overload Relay
- C) Circuit Breaker
- D) Earth Leakage Relay

Answer: C) Circuit Breaker

4694. What is the purpose of earthing in an electrical system?

- A) To prevent excessive voltage rise
- B) To protect equipment from lightning
- C) To ensure the safety of personnel by providing a safe path for fault current
- D) To reduce power loss

Answer: C) To ensure the safety of personnel by providing a safe path for fault current

4695. What is the primary function of the MCC (Motor Control Center) in a Rail Wheel Factory's electrical system?

- A) To control the speed of motors
- B) To monitor the voltage level
- C) To distribute power to machines
- D) To store electrical power

Answer: A) To control the speed of motors

4696. Which of the following is essential to prevent damage to electrical equipment in the event of a fault?

- A) Surge Protection
- B) Switchgear
- C) Transformer
- D) All of the above

Answer: D) All of the above

4697. The electrical system of a Rail Wheel Factory is usually grounded through:

- A) A copper rod or plate in the ground
 - B) A resistance wire in the power line
 - C) A transformer connection
 - D) All of the above
- Answer: A) A copper rod or plate in the ground

4698. What is the function of a surge protector in an electrical system?

- A) To store electrical power
- B) To protect sensitive electrical components from voltage spikes
- C) To regulate voltage
- D) To increase current flow

Answer: B) To protect sensitive electrical components from voltage spikes

4699. Which of the following protection devices is used to detect earth leakage faults?

- A) Earth Leakage Relay (ELR)
- B) Overcurrent Relay

C) Circuit Breaker

D) Fuse

Answer: A) Earth Leakage Relay (ELR)

4700. Which of the following is typically used to control the voltage level in an HT distribution system?

A) Transformer

B) Breaker Panel

C) Capacitor Bank

D) Automatic Voltage Regulator (AVR)

Answer: A) Transformer

4701. HT panel in an MRS usually contains:

A) Overload relays

B) Circuit breakers

C) Isolators

D) All of the above

Answer: D) All of the above

4702. What kind of electrical motor is typically used in heavy machinery in a Rail Wheel Factory?

A) Induction motor

B) Synchronous motor

C) DC motor

D) Stepper motor

Answer: A) Induction motor

4703. Which protection device is used to disconnect the power supply to motors in the event of an overload?

A) Circuit Breaker

B) Thermal Overload Relay

C) Surge Protector

D) Earth Fault Relay

Answer: B) Thermal Overload Relay

4704. What is the primary purpose of an earth fault relay in the electrical system of a factory?

A) To regulate voltage

B) To disconnect power in case of a fault between phase and earth

C) To prevent overcurrent

D) To measure the frequency of electrical signals

Answer: B) To disconnect power in case of a fault between phase and earth

4705. Which type of motor starter is used for motors requiring a high inrush current?

A) Star-Delta Starter

B) Auto Transformer Starter

C) Direct-On-Line Starter

D) A & B

Answer: D) A & B

4706. What is the function of an Automatic Voltage Regulator (AVR)?

- A) To maintain a constant voltage level across electrical equipment
- B) To protect against short circuits
- C) To convert AC to DC
- D) To provide surge protection

Answer: A) To maintain a constant voltage level across electrical equipment

4707. The power factor correction is typically done using:

- A) Capacitor Banks
- B) Transformers
- C) Inductive Loads
- D) Rectifiers

Answer: A) Capacitor Banks

4708. What is the maximum voltage level that the LT distribution system typically handles in a Rail Wheel Factory?

- A) 220V
- B) 415V
- C) 660V
- D) 1000V

Answer: B) 415V

4709. What type of earthing system is typically used in large industrial plants like Rail Wheel Factories?

- A) Solid Earthing
- B) Neutral Earthing
- C) Grounding Through Resistance
- D) Both A and B

Answer: D) Both A and B

4710. What is the primary function of an isolation switch in an electrical system?

- A) To measure the current
- B) To connect and disconnect power circuits for maintenance
- C) To control the motor speed
- D) To distribute electrical power

Answer: B) To connect and disconnect power circuits for maintenance

4711. Which electrical protection device would you use to protect a motor from damage due to excessive current?

- A) Earth Fault Relay
- B) Thermal Overload Relay
- C) Circuit Breaker
- D) Fuse

Answer: B) Thermal Overload Relay

4712. In the context of the HT and LT systems in the MRS, what does the term 'busbar' refer to?

- A) A safety relay

B) A conductor that connects different electrical circuits

C) A switchgear device

D) A type of transformer

Answer: B) A conductor that connects different electrical circuits

4713. What is the most common method of power factor correction in industrial setups?

A) Using a DC generator

B) Installing capacitor banks

C) Using synchronous motors

D) All of the above

Answer: B) Installing capacitor banks

4714. The protective devices in an electrical distribution system are designed to:

A) Increase the voltage

B) Prevent overheating of machinery

C) Disconnect circuits during faults

D) Increase the efficiency of transformers

Answer: C) Disconnect circuits during faults

c) Single Line Diagram of Ring Main System – RWF

4715. What is the primary advantage of a Ring Main System in an industrial electrical distribution network?

A) Higher reliability of power supply

B) Easy installation

C) Low operational cost

D) Simple to maintain

Answer: A) Higher reliability of power supply

4716. In a Ring Main System, what happens if one part of the ring is disconnected?

A) The power supply to the entire system is lost

B) The system continues to operate through the other path of the ring

C) Power is transferred to backup sources

D) Only the connected portion of the system loses power

Answer: B) The system continues to operate through the other path of the ring

4717. Which of the following is a key feature of the Ring Main System?

A) It has no redundancy

B) It has multiple paths for power supply

C) It uses only one supply source

D) It requires only manual switching

Answer: B) It has multiple paths for power supply

4718. The Ring Main System is typically used for:

A) Low voltage distribution only

B) High voltage transmission

C) Industrial power distribution

D) Power generation

Answer: C) Industrial power distribution

4719. Which of the following components is used to isolate sections of the Ring Main System for maintenance?

A) Busbars

B) Circuit breakers

C) Fuses

D) Isolators

Answer: D) Isolators

4720. In a Ring Main System, what is the role of the automatic changeover switch?

A) To connect the ring to the power grid

B) To ensure that power is supplied from an alternative path in case of failure

C) To control the voltage

D) To monitor the current flow

Answer: B) To ensure that power is supplied from an alternative path in case of failure

4721. What type of protection is usually used in the Ring Main System to prevent overloads?

A) Earth leakage relay

B) Overcurrent protection relay

C) Differential protection relay

D) Under-voltage relay

Answer: B) Overcurrent protection relay

4722. Which of the following is a common application of the Ring Main System in an industrial setting?

A) Emergency power supply

B) Uninterruptible power supply (UPS) systems

C) High-precision manufacturing equipment

D) General industrial electrical distribution

Answer: D) General industrial electrical distribution

4723. How does the Ring Main System maintain continuous power supply even during faults?

A) By switching to a backup generator

B) By using parallel paths for power distribution

C) By reducing the load on the system

D) By increasing the voltage levels

Answer: B) By using parallel paths for power distribution

4724. What is the primary function of circuit breakers in a Ring Main System?

A) To regulate voltage

B) To disconnect faulty sections

C) To provide power to all sections

D) To monitor the temperature

Answer: B) To disconnect faulty section

4725. In a typical Ring Main System, where is the main transformer usually located?

- A) At the starting point of the ring
- B) In the middle of the ring
- C) At the end of the ring
- D) At any point along the ring, depending on the design

Answer: A) At the starting point of the ring

4726. In the Ring Main System, how is load sharing typically handled between parallel circuits?

- A) Manual switching
- B) Automatic load balancing
- C) Overload detection
- D) By using transformers

Answer: B) Automatic load balancing

4727. Which of the following ensures that the electrical system is always balanced in a Ring Main configuration?

- A) Voltage regulators
- B) Circuit breakers
- C) Transformers
- D) Proper load distribution

Answer: D) Proper load distribution

4728. What is the role of busbars in a Ring Main System?

- A) To provide a path for current from multiple sources to load
- B) To isolate faulty circuits
- C) To measure power consumption
- D) To reduce energy loss

Answer: A) To provide a path for current from multiple sources to load

4729. What is one of the most common faults that the Ring Main System is designed to handle?

- A) Short-circuit faults
- B) Transformer failure
- C) Voltage surge
- D) Overload conditions

Answer: A) Short-circuit faults

4730. What kind of protection system is used to detect faults in a Ring Main System before they cause significant damage?

- A) Overcurrent protection
- B) Differential protection
- C) Short-circuit protection
- D) All of the above

Answer: D) All of the above

4731. In a Ring Main System, what type of relay is used to detect faults between phases?

- A) Overload relay
- B) Earth fault relay
- C) Differential protection relay
- D) Phase-failure relay

Answer: C) Differential protection relay

4732. What would happen if an overcurrent condition occurs in a Ring Main System without proper protection?

- A) The circuit would continue to operate normally
- B) The system would trip automatically to avoid damage
- C) The power supply would shut down for all connected loads
- D) The load would automatically reduce

Answer: B) The system would trip automatically to avoid damage

4733. In the event of a fault, which device is typically responsible for isolating the faulty section in a Ring Main System?

- A) Load Break Switch
- B) Overcurrent Relay
- C) Circuit Breaker
- D) Voltage Transformer

Answer: C) Circuit Breaker

4734. What is a key feature of Ring Main Units (RMU) in the Ring Main System?

- A) They control the entire factory's power distribution
- B) They provide automatic fault isolation
- C) They reduce the need for circuit breakers
- D) They act as transformers

Answer: B) They provide automatic fault isolation

4735. Which of the following is essential for maintaining the safety and reliability of a Ring Main System?

- A) Regular maintenance and testing
- B) Overloading of the system
- C) Increasing the system's voltage
- D) Ensuring that the system is under-loaded

Answer: A) Regular maintenance and testing

4736. What is the benefit of having a Ring Main System in terms of fault tolerance?

- A) It reduces the total cost of installation
- B) It allows for simultaneous power supply to all sections
- C) It ensures that the system remains operational even if one path is faulty
- D) It allows only one path for power distribution

Answer: C) It ensures that the system remains operational even if one path is faulty

4737. What is the standard protection device used in Ring Main Systems for detecting earth faults?

- A) Earth Fault Relay
- B) Current Transformer
- C) Fuse
- D) Surge Protector

Answer: A) Earth Fault Relay

4738. In an industrial environment, the Ring Main System is designed to be:

- A) Single-path
- B) Dual-path for redundancy
- C) Manual switching only
- D) Non-interruptible

Answer: B) Dual-path for redundancy

4739. Which of the following is the best practice for improving the reliability of the Ring Main System?

- A) Limit the number of branches in the ring
- B) Use manual switches for maintenance
- C) Ensure automatic load balancing and fault detection
- D) Increase the load on the system to maximize efficiency

Answer: C) Ensure automatic load balancing and fault detection

4740. The main disadvantage of a Ring Main System is:

- A) High operational cost
- B) Difficulty in fault isolation
- C) Complexity in design and installation
- D) Increased downtime in case of fault

Answer: C) Complexity in design and installation

4741. What is the purpose of fuses in a Ring Main System?

- A) To increase power supply reliability
- B) To protect the system from overcurrent and short-circuit faults
- C) To provide energy savings
- D) To monitor the power quality

Answer: B) To protect the system from overcurrent and short-circuit faults

4742. In the Ring Main System, if one section of the ring is disconnected, what happens?

- A) The entire system shuts down
- B) The rest of the ring continues to function normally through an alternate path
- C) The power supply switches to backup generators
- D) Only the disconnected section loses power

Answer: B) The rest of the ring continues to function normally through an alternate path

4743. The main advantage of automatic changeover switches in a Ring Main System is:

- A) Preventing voltage fluctuations
- B) Ensuring continuous power supply during faults
- C) Monitoring current levels

D) Reducing power consumption

Answer: B) Ensuring continuous power supply during faults

4744. Which protection device in the Ring Main System is used to monitor and disconnect faulty sections due to overload?

A) Earth Fault Relay

B) Overload Relay

C) Differential Relay

D) Voltage Regulator

Answer: B) Overload Relay

d) Protection and controls used for DG Set

4745. What is the primary purpose of a Diesel Generator (DG) set in a Rail Wheel Factory (RWF)?

A) To power the factory's lighting system

B) To provide emergency backup power during grid failure

C) To reduce energy consumption

D) To cool down electrical equipment

Answer: B) To provide emergency backup power during grid failure

4746. Which protection device is commonly used to prevent overcurrent in the DG set circuit?

A) Earth Fault Relay

B) Overcurrent Relay

C) Differential Protection Relay

D) Under-voltage Relay

Answer: B) Overcurrent Relay

4747. What is the function of the overload relay in a DG set?

A) To regulate the voltage

B) To protect the generator from exceeding safe operating current limits

C) To detect low fuel levels

D) To control the engine speed

Answer: B) To protect the generator from exceeding safe operating current limit

4748. Which device is used for controlling the voltage output of a DG set?

A) Voltage Regulator

B) Earth Fault Relay

C) Overcurrent Relay

D) Surge Protector

Answer: A) Voltage Regulator

4749. What is the purpose of a coolant temperature sensor in a DG set?

A) To monitor the fuel efficiency

B) To prevent overheating by monitoring the engine coolant temperature

C) To ensure smooth engine operation

D) To regulate engine speed

Answer: B) To prevent overheating by monitoring the engine coolant temperature

4750. Which of the following is typically used to protect a DG set from short circuits?

- A) Earth Fault Relay
- B) Circuit Breaker
- C) Differential Protection
- D) Isolation Transformer

Answer: B) Circuit Breaker

4751. What is the purpose of a speed governor in a DG set?

- A) To maintain the engine speed at a constant level under varying load conditions
- B) To regulate the fuel flow to the engine
- C) To reduce emissions
- D) To monitor the exhaust gas temperature

Answer: A) To maintain the engine speed at a constant level under varying load conditions

4752. In a DG set, automatic voltage regulation (AVR) helps to:

- A) Automatically start the engine
- B) Regulate the generator's output voltage
- C) Control the fuel injectors
- D) Increase the engine power

Answer: B) Regulate the generator's output voltage

4753. What protection is typically used in DG sets to prevent overvoltage?

- A) Overcurrent Relay
- B) Overvoltage Relay
- C) Under-voltage Relay
- D) Low Power Factor Relay

Answer: B) Overvoltage Relay

4754. Which type of control system is commonly used to start and stop a DG set automatically based on power failure?

- A) Manual Control System
- B) Automatic Transfer Switch (ATS)
- C) PLC-based control system
- D) Local On/Off Switch

Answer: B) Automatic Transfer Switch (ATS)

4755. What is the role of the Automatic Transfer Switch (ATS) in DG set operation?

- A) To maintain constant power output
- B) To automatically switch between mains and DG set power during a power failure
- C) To control the fuel intake to the DG set
- D) To monitor exhaust emissions

Answer: B) To automatically switch between mains and DG set power during a power failure

4756. What is the function of a fuel level sensor in a DG set?

- A) To monitor fuel consumption
- B) To measure the fuel temperature
- C) To alert operators when the fuel tank is running low
- D) To control the fuel injection timing

Answer: C) To alert operators when the fuel tank is running low

4757. Which protection device is used to prevent low oil pressure in a DG set?

- A) Low Oil Pressure Switch
- B) Overcurrent Relay
- C) Voltage Regulator
- D) High Temperature Shutdown

Answer: A) Low Oil Pressure Switch

4758. What type of protection is used to prevent overheating of the DG engine?

- A) High Temperature Shutdown
- B) Voltage Regulator
- C) Load Shedding
- D) Overvoltage Relay

Answer: A) High Temperature Shutdown

4759. Which type of control system is responsible for regulating the speed of a DG engine?

- A) Fuel Flow Control
- B) Load Control System
- C) Speed Governor
- D) Voltage Regulation Control

Answer: C) Speed Governor

4760. In the context of a DG set, what does the term "load sharing" refer to?

- A) Balancing the load between the generator and the utility supply
- B) Distributing the power equally across multiple generators
- C) The process of controlling fuel consumption
- D) The regulation of the engine's cooling system

Answer: B) Distributing the power equally across multiple generators

4761. Which protection device is used to detect a phase failure in a DG set?

- A) Phase Failure Relay
- B) Overload Relay
- C) Low Voltage Relay
- D) Earth Fault Relay

Answer: A) Phase Failure Relay

4762. What is the function of a battery charger in a DG set?

- A) To charge the battery that powers the DG set's starting system
- B) To provide power to the control system
- C) To ensure voltage regulation
- D) To monitor the fuel level in the tank

Answer: A) To charge the battery that powers the DG set's starting system

4763. Which relay is used for earth fault protection in DG sets?

- A) Earth Fault Relay
- B) Overcurrent Relay
- C) Phase Sequence Relay
- D) Differential Protection Relay

Answer: A) Earth Fault Relay

4764. What is the key function of a cooling fan in a DG set?

- A) To increase fuel efficiency
- B) To cool the engine and prevent overheating
- C) To monitor the exhaust gases
- D) To supply air for combustion

Answer: B) To cool the engine and prevent overheating

4765. What type of protection would be used in a DG set to prevent dry running of the engine?

- A) Low fuel level alarm
- B) Low water level protection
- C) Low oil pressure switch
- D) Both B and C

Answer: D) Both B and C

4766. What is typically used to monitor the exhaust temperature of a DG set?

- A) Exhaust Gas Temperature Sensor
- B) Oil Pressure Switch
- C) Speed Governor
- D) Load Controller

Answer: A) Exhaust Gas Temperature Sensor

4767. In a DG set, automatic shutdown is triggered in case of:

- A) Low voltage output
- B) High temperature or low oil pressure
- C) Overload condition
- D) All of the above

Answer: D) All of the above

4768. What is the main purpose of Differential Protection in DG sets?

- A) To protect the engine from high temperatures
- B) To detect faults between phases or between phase and ground
- C) To maintain engine speed
- D) To regulate voltage output

Answer: B) To detect faults between phases or between phase and ground

4769. What kind of system is used for remote monitoring and control of DG sets?

- A) PLC-based control system
- B) Manual control system

- C) SCADA system
 - D) Direct voltage control system
- Answer: C) SCADA system

4770. Which of the following is NOT a feature of the Automatic Transfer Switch (ATS)?

- A) Automatic switching between DG set and utility supply
- B) Protection against electrical faults
- C) Control over the voltage regulation of the DG set
- D) Manual operation only

Answer: D) Manual operation only

4771. Which device is used to monitor the fuel consumption of a DG set?

- A) Fuel Gauge
- B) Load Bank
- C) Fuel Flow Meter
- D) Fuel Pressure Switch

Answer: C) Fuel Flow Meter

4772. Which of the following is part of the generator protection system for detecting faults?

- A) Generator Excitation System
- B) Generator Protection Relay
- C) Fuel Injection System
- D) Alternator Controller

Answer: B) Generator Protection Relay

4773. What type of protection device is used to prevent reverse power flow in DG sets?

- A) Reverse Power Relay
- B) Earth Fault Relay
- C) Overcurrent Relay
- D) Under-frequency Relay

Answer: A) Reverse Power Relay

4774. Which of the following is used for fuel system control in a DG set?

- A) Fuel Injection Pump
- B) Fuel Pressure Regulator
- C) Diesel Tank Valve
- D) All of the above

Answer: D) All of the above

4775. Which is not a common maintenance hazard with cranes

- A) Damage to wire rope
- B) Alignment Issues
- C) Bent/ damaged hooks
- D) Chipped Paint

Ans: D

4776. An overhead crane that consist of parallel runways with a travelling bridge is known as

- A) Road mobile Crane
- B) Monorail Crane
- C) Bridge crane
- D) Jib crane

Ans: C

4777. Type of crane where a horizontal beam extends to lift and move a load along the beam is known as

- A) Gantry Crane
- B) Monorail Crane
- C) Bridge crane
- D) Jib crane

Ans: D

4778. A crane that is shut down for various reasons should be

- A) Sold out
- B) Kept Open
- C) Locked out and tagged out
- D) Painted black

Ans: C

4779. Preventive maintenance is

- A) Maintenance carried out before an issue is identified
- B) Maintenance carried out after an issue is identified
- C) Maintenance carried out after an accident
- D) None of the above

Ans: A

4780. What is full form of L.T pertaining to EOT cranes?

- A) Limited travel
- B) Longitudinal travel
- C) Long travel
- D) Lengthy travel

Ans: B

4781. What is full form of C.T pertaining to EOT cranes?

- A) Complete travel
- B) Common travel
- C) Cross travel
- D) Close travel

Ans: C

4782. What is the full form of M.H pertaining to EOT cranes?

- A) Material Handling
- B) Mini Hoist
- C) Main Hoist
- D) Main Handle

Ans: C

4783. What is full form of A.H pertaining to EOT cranes?

- A) Additional Handle
- B) Auxiliary Hoist
- C) Additional Hoist
- D) None of the above

Ans: B

4784. Hand signal during operations are used when

- A) the operator is deaf
- B) voice communications can not be heard
- C) rigger is dumb
- D) none of the above

Ans: B

4785. _____ is used to douse general fire

- A) Fire extinguisher
- B) Life guard
- C) Alcohol
- D) Air blowing

Ans: A

4786. Crane driver should accept emergency stop from

- A) Only rigger engaged with his crane
- B) all riggers at site
- C) anybody working at site
- D) Only his supervisor

Ans: C

4787. At a time crane driver should accept signals from

- A) Only rigger engaged with his crane
- B) all riggers at site
- C) anybody working at site
- D) Only his supervisor

Ans: A

4788. Total number of EOT cranes in the Axle Forge shop is

- A) 2
- B) 4
- C) 5
- D) 3

Ans: C

4789. Total number of EOT cranes in the Axle machine shop is

- A) 2
- B) 4
- C) 3
- D) 5

Ans: B

4790. Total number of EOT cranes in the Axle Assembly Bay is

- A) 1
- B) 2
- C) 3
- D) 4

Ans: D

4791. Total number of EOT cranes in the Wheelset loading Bay is

- A) 2
- B) 3
- C) 4
- D) 5

Ans: B

4792. Total number of EOT cranes in the SPC Bay is

- A) 2
- B) 3
- C) 4
- D) 5

Ans: C

4793. Axle Shop Control is carrying out the electrical maintenance activities of _____ number of cranes in RWF

- A) 13
- B) 16
- C) 20
- D) 21

Ans: C

4794. 10 Ton capacity crane is used in which area of the Axle shop?

- A) Forge Shop
- B) Machine Shop
- C) Assembly Shop
- D) None of the above

Ans: B

4795. All the Assembly shop cranes are of

- A) 10T
- B) 5T
- C) 15T
- D) 3T

Ans: B

4796. Capacity of Axle forge shop cranes is

- A) 5T
- B) 10T
- C) 15T
- D) 20T

Ans: C

4797. Maximum used Auxiliary hoist capacity of EOT cranes in Axle shop is

- A) 2T
- B) 3T
- C) 5T
- D) None of the above

Ans: D

4798. The safety devices of EOT cranes include

- A) Anti Collision device
- B) Rotary switches
- C) Over travel switches
- D) All of these

Ans: D

4799. How many corner switches will be there in an EOT crane in general

- A) 1
- B) 2
- C) 4
- D) 3

Ans: C

4800. If any of the corner switch is operated, then _____

- A) LT operation will be stopped
- B) CT operation will be stopped
- C) Hoist operation will be stopped
- D) All operations of the crane will be stopped

Ans: D

4801. The safety device which is used to limit the upward movement of the hoist operation is

- A) Rotary switch
- B) Gravity switch
- C) All of the above
- D) None of the above

Ans: C

4802. When the gravity switch is operated

- A) Hoist operation will be stopped
- B) All operations will be stopped
- C) LT operation will be stopped
- D) None of the above

Ans: B

4803. Which of the following act as a secondary safety device

- A) Gravity switch
- B) Rotary switch
- C) Over travel switches
- D) Corner switches

Ans: A

4804. All the safety devices of the EOT cranes are controlled by

- A) Protective panel
- B) Auxiliary Hoist panel
- C) Main Hoist panel
- D) Rectifier panel

Ans: A

4805. Rectangular magnet is used in

- A) Axle forge shop
- B) Machine shop
- C) Assembly shop
- D) None of these

Ans: A

4806. The capacity of rectangular magnets in the axle forge shop is

- A) 1kw
- B) 2kw
- C) 3kw
- D) 5kw

Ans: B

4807. Capacity of circular magnets in the SPC bay is

- A) 15kw
- B) 18.5kw
- C) 20kw
- D) 22.5kw

Ans: B

4808. Circular magnets are used for

- A) Lifting hot axles from the furnace discharge area
- B) Loading and unloading of blooms
- C) Both A and B
- D) Lifting of Scraps

Ans: D

4809. Rectangular magnets are used for

- A) Lifting hot axles from the furnace discharge area
- B) Loading and unloading of blooms
- C) Both A and B
- D) Lifting of Scraps

Ans: C

4810. Capacity of battery bank in the Forge shop cranes are

- A) 110V
- B) 220V
- C) 400V
- D) None of the above

Ans: A

4811. Capacity of battery bank in the SPC bay cranes are

- A) 110V
- B) 220V
- C) 400V
- D) None of the above

Ans: B

4812. Periodical maintenance of EOT cranes are carried out

- A) monthly
- B) quarterly
- C) half yearly
- D) All of the above

Ans: D

4813. Recommended duty cycle of motors used in the EOT cranes are

- A) S1
- B) S4
- C) Any of these
- D) None of these

Ans: B

4814. How many LT motors are there in each 15/2 T cranes of Axle shop?

- A) 1
- B) 2
- C) 3
- D) 4

Ans: D

4815. 41. How many LT motors are there in the 5T EOT cranes of Axle shop?

- A) 1
- B) 2
- C) 3
- D) 4

Ans: B

4816. What is the capacity of LT motors in the Forge shop EOT cranes?

- A) 5.5 kw
- B) 9.3kw
- C) 7.5kw
- D) 15kw

Ans: B

4817. What is the capacity of CT motors in the Forge shop EOT cranes?

- A) 5.5kw
- B) 9.3kw
- C) 7.5kw
- D) 15kw

Ans: A

4818. What is the full form of DSL in EOT cranes

- A) Duct system line
- B) Down supply lead
- C) Digital subscriber line
- D) Direct supply line

Ans: B

4819. Type of motor starter used in the EOT cranes is

- A) DOL
- B) Star delta
- C) VFD
- D) None of the above

Ans: VFD

4820. Full form of DBR in EOT cranes

- A) Dynamic braking recorder
- B) Drive braking resistance
- C) Diminishing brake resistance
- D) None of the above

Ans: B

4821. Panel used for charging of batteries of EOT crane is known as

- A) Magnet panel
- B) Hoist panel
- C) Rectifier panel
- D) Protective panel

Ans: C

4822. Full form of VFD is

- A) Voltage Frequency drive
- B) Variable frequency drive
- C) Variable fraction drive
- D) Voltage fixed drive

Ans: B

4823. Which of the following is a best practice for operating a crane?

- A) Conducting a pre shift inspection
- B) Speeding up operations to save time
- C) Ignoring hand signals if they seem unclear
- D) Operating the crane at the maximum capacity for efficiency

Ans: A

4824. Supply to the break thrustors of an EOT crane is

- A) 415 VAC
- B) 220VAC
- C) 110VAC
- D) 110VDC

Ans: A