

**JUNIOR ENGINEER/CONTROL GROUP/ELECTRICAL DEPARTMENT**  
**PART - I**

**I. ELECTRICAL CIRCUITS**

1. 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)**

2. 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)**

3. 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)**

4. 150 resistor and the combination in series with a 120 resistor. The equivalent resistance of the circuit is:
- (a) 37  $\Omega$
  - (b) 27  $\Omega$
  - (c) 18  $\Omega$
  - (d) None of these

**Ans: (c)**

5. 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)**

6. 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)**

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

- (a)  $0.625 \times 10^{19}$
- (b)  $1.6 \times 10^{19}$
- (c)  $10^{19}$
- (d) None of these

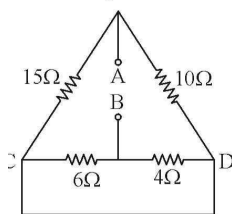
**Ans: (a)**

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

- (a)  $2\Omega, 4W$
- (b)  $1\Omega, 4W$
- (c)  $1\Omega, 2W$
- (d)  $2\Omega, 2W$

**Ans: (b)**

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



- (a)  $8.4 \Omega$
- (b)  $4 \Omega$
- (c)  $2.5 \Omega$
- (d)  $6.8 \Omega$

**Ans: (a)**

10. 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)**

11. 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)**

12. 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**

13. \_\_\_\_\_ remains the same in all parts of a series circuit.

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

**Ans: (a)**

14. Resistivity of a wire depends upon

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

**Ans: (a)**

15. 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)**

16. 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)**

17. A 2.2 m long conductor has a cross sectional area of 0.025 m<sup>2</sup> 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)**

18. 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)**

19. \_\_\_\_\_ 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)**

20. 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)**
21. A nickel coil has a resistance of  $16\Omega$  at  $50^\circ\text{C}$ . If the temperature coefficient of resistance at  $0^\circ\text{C}$  is  $0.003/^\circ\text{C}$ , the resistance at  $0^\circ\text{C}$  is: (approx)
- (a)  $16.9\Omega$
  - (b)  $14\Omega$
  - (c)  $23.3\Omega$
  - (d)  $15.5\Omega$
- Ans: (b)**
22. One coulomb-per-second is equal to one --.
- (a) Watt
  - (b) Joule
  - (c) Volt
  - (d) Ampere
- Ans: (d)**
23. 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)**
24. Electrical voltage is also known as:
- (a) Electric pressure
  - (b) Energy
  - (c) Watt
  - (d) Unit
- Ans: (a)**
25. The length of wire having resistance of  $1\text{ ohm/m}$  in a heater rated at  $1000\text{ W}$  and  $250\text{ V}$  will be
- (a)  $62.8\text{ mm}$
  - (b)  $26.5\text{ m}$
  - (c)  $62.5\text{ m}$
  - (d)  $1.5\text{ m}$
- Ans: (c)**
26. Calculate the resistance of  $1\text{ km}$  long copper wire of radius  $1\text{ mm}$ . (If resistivity of copper =  $1.72 \times 10^{-8}$ )
- (a)  $5.5\Omega$
  - (b)  $6.5\Omega$
  - (c)  $4.5\Omega$
  - (d)  $6.75\Omega$
- Ans: (a)**

27. How is the voltage determined when the current and resistance are given?
- Divide the current by the resistance
  - Subtract the current from the resistance
  - Multiply the current and resistance
  - Add the current and the resistance
- Ans: (c)**
28. 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 -----
- 1
  - 5
  - 4
  - 3
- Ans: (b)**
29. The number of nodal equation in the nodal analysis of a linear circuit having 4 nodes will be
- 6
  - 5
  - 3
  - 4
- Ans: (c)**
30. 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?
- 1.75, 7
  - 7, 1.5
  - 7, 0.571
  - 7, 7
- Ans:(c)**
31. The average power consumed in purely inductive circuit is:-
- 0.25
  - 0
  - 0.5
  - 1
- Ans: (b)**
32. In a DC circuit, which of the following components is used to reduce the voltage?
- Resistor
  - Inductor
  - Reactor
  - Capacitor
- Ans: (a)**
33. The law of electromagnetic induction is also called
- Joule's law
  - Faraday's law
  - Coulomb's law
  - Ohm's law
- Ans: (b)**

34. 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)**

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

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

**Ans: (c)**

36. 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)**

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

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

**Ans: (c)**

38. The resistance of a conductor varies inversely as

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

**Ans: (b)**

39. With rise in temperature the resistance of pure metals

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

**Ans: (a)**

40. 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)**

41. 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)**

42. 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)**

43. Two resistors are not said to be connected in series when
- (a) Same current passes in tum through both
  - (b) Both carry the same value of current
  - (c) Total current equals the sum of branchcurrents
  - (d) Sum of IR drops equals the applied e.m.f.

**Ans: (c)**

44. 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)**

45. 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)**

46. 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)**

47. 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)**

48. Siemens is a unit for measuring

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

**Ans: (c)**

49. 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)**

50. 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)**

51. 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)**

52. 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)**

53. 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)**

54. 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)**



55. Delta/star or star/delta transformation technique is applied to :
- One terminal network
  - Two terminal network
  - Three terminal network
  - None of these
- Ans: (c)**
56. In a parallel circuit all components must \_\_\_\_
- Have same potential difference across them
  - Have the same value
  - Carry the same current
  - All of the above
- Ans: (a)**
57. A Student connects four cells each of emf 2 V and internal resistance 0.5  $\Omega$ . In series but the one cell has its terminal reversed. Now the current in parallelly connected 2  $\Omega$  resistor-
- zero
  - 1 A
  - 1.5 A
  - 2 A
- Ans: (b)**
58. High pass T Filter has
- Low input impedance at low frequencies
  - High input impedance at high frequencies
  - High output impedance at low frequencies
  - Low input impedance at high frequencies
- Ans: (d)**
59. A network having a battery source in one of its arms is termed as -----
- Lienar, network
  - bilateral network
  - active network
  - passive network
- Ans: (c)**
60. 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
- 1:2
  - 2:1
  - 1:4
  - 4:1
- Ans: (b)**
61. Two resistance R<sub>1</sub> and R<sub>2</sub> are connected in series R<sub>1</sub> =  $528 \pm 5\Omega$  and R<sub>2</sub> =  $325 \pm 3\Omega$ . The total resistance will be -
- $853 \pm 2\Omega$
  - $853 \pm 5\Omega$
  - $853 \pm 3\Omega$
  - $853 \pm 8\Omega$
- Ans: (d)**

62. 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)**
63. 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)**
64. A charge of 5  $\mu\text{C}$  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  $\mu\text{A}$
  - (b) 50 mA
  - (c) 50 nA
  - (d) 0.5 mA
- Ans: (d)**
65. Two 10  $\mu\text{F}$  capacitors are connected in parallel. What is the equivalent capacitor value ?
- (a) 25  $\mu\text{F}$
  - (b) 40  $\mu\text{F}$
  - (c) 5  $\mu\text{F}$
  - (d) 20  $\mu\text{F}$
- Ans: (d)**
66. If a capacitor stores 100 $\mu\text{C}$  charge at 10 volts, the capacitance value is:
- (a) 100  $\mu\text{F}$
  - (b) 1000  $\mu\text{F}$
  - (c) 10  $\mu\text{F}$
  - (d) 1  $\mu\text{F}$
- Ans: (c)**
67. During charging of a capacitor of  $C = 100 \mu\text{F}$  through a resistance of 1 k $\Omega$  applied with 100 V, the voltage at one time constant is -----
- (a) 36.7 V
  - (b) 63.2 V
  - (c) 100 V
  - (d) 63.7 V
- Ans: (b)**
68. 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)**

69. 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)**

70. 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)**

71. 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)**

72. 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)**

73. If three capacitors  $C_1$ ,  $C_2$  and  $C_3$  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)**

74. A capacitor opposes:

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

**Ans: (b)**

75. 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)**

76. 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)**

77. An electrolyte capacitor can be used for:

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

**Ans: (a)**

78. 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)**

79. The electrical capacitance is analogous of

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

**Ans: (d)**

80. 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)**

81. Two capacitors of  $2\mu\text{F}$  and  $3\mu\text{F}$  are connected in series across 1 OV. The potential difference across the  $2\mu\text{F}$  capacitor will be:

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

**Ans: (b)**

82. A battery of 40 V and three capacitors 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) approximately
- (a) 3:64
  - (b) 64:3
  - (c) 160:3
  - (d) 104:5
- Ans: (d)**
83. A capacitor capable of storing 1J of energy at 100 V DC supply. The value of capacitance will be?
- (a) 100  $\mu\text{F}$
  - (b) 200  $\mu\text{F}$
  - (c) 50  $\mu\text{F}$
  - (d) 400  $\mu\text{F}$
- Ans: (b)**
84. 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)**
85. 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)**
86. 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)**
87. A circuit component that opposes the change in circuit voltage is
- (a) Resistance
  - (b) Capacitance
  - (c) Inductance
  - (d) All of these
- Ans: (b)**
88. Capacitance, Voltage and Charge are related as
- (a)  $Q = CV$
  - (b)  $C = QV$
  - (c)  $V = QC$

(d) None of these

**Ans: (a)**

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

(a) 20  $\mu\text{F}$

(b) 40  $\mu\text{F}$

(c) 160  $\mu\text{F}$

(d) 320  $\mu\text{F}$

**Ans: (a)**

90. The energy required to charge a 10 F capacitor to 100 V is

(a) 0.10 J

(b)  $5 \times 10^4$  J

(c)  $5 \times 10^{-9}$  J

(d)  $10 \times 10^{-9}$  J

**Ans: (b)**

91. 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)**

92. 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)**

93. 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)**

94. The unit of dielectric strength is given by

(a) V/m

(b)  $\text{V}^2/\text{m}$

(c) m/V

(d)  $\text{m}/\text{V}^2$

**Ans: (a)**

95. A capacitor stores energy in -----

(a) Electric field

(b) Electromagnetic

(c) Magnetic field

(d) Dielectric dipole

**Ans: (a)**

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

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

**Ans: (b)**

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

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

**Ans: (d)**

98. A circuit requires a capacitor of 100  $\mu\text{F}$ , 25V The capacitor can be:

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

**Ans: (b)**

99. The total capacitance of two 40  $\mu\text{F}$  series connected capacitors in parallel with a 4  $\mu\text{F}$  capacitor is

- (a) 3.8  $\mu\text{F}$
- (b) 5  $\mu\text{F}$
- (c) 24  $\mu\text{F}$
- (d) 44  $\mu\text{F}$

**Ans: (c)**

100. 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)**

101. In capacitor circuit, the current leads the voltage by an angle  $\phi$  the loss angle of the same capacitor will be

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

**Ans: (b)**

102. 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)**

103. Two capacitor C1 and C2 have  $C_1=20\mu\text{F}$  and  $C_2=30\mu\text{F}$ , 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)**

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

(a) Mica

(b) Air

(c) Ceramic

(d) Electrolytic

**Ans: (d)**

105. 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)**

106. 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)**

107. 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)**

108. 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)**

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

(a) Porcelain

(b) Glass

(c) Polystyrene

(d) Soft rubber



**Ans: (a)**

110. The reactance of capacitors increases, when:

- (a) Applied voltage increases
- (b) AC frequency increases
- (c) Applied voltage decreases
- (d) AC frequency decreases

**Ans: (d)**

111. 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)**

112. The potential difference across a 20  $\mu\text{F}$  capacitor to charge it with 100 mC is

- (a) 10 V
- (b) 10 kV
- (c) 5 V
- (d) 5 kV

**Ans: (d)**

113. 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)**

114. 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)**

115. 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)**

116. 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)**

117. 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)**

118. 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)  $10\Omega$
- (b)  $20\Omega$
- (c)  $40\Omega$
- (d)  $50\Omega$

**Ans: (a)**

119. A capacitor dissipates \_\_\_\_\_ energy.

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

**Ans: (a)**

120. 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)**

121. 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)**

122. 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)**

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

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

**Ans: (b)**

124. A voltage source and two resistors are connected in parallel. Suppose that  $v_s=150\text{V}$ ,  $R_1=50\Omega$  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)**

125. 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)**

126. A voltage source of  $10\text{ V}$  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)  $260\Omega$
- (b)  $250\Omega$
- (c)  $220\Omega$
- (d)  $200\Omega$

**Ans: (c)**

127. Two resistors of  $200\text{ ohm}$  and  $100\text{ ohm}$  are connected in parallel to a  $100\text{ volt}$  source. Total current taken by the circuit will be -

- (a)  $0.66\text{ Ampere}$
- (b)  $3.0\text{ Ampere}$
- (c)  $0.33\text{ Ampere}$
- (d)  $1.5\text{ Ampere}$

**Ans: (d)**

128. If a D.C.  $240\text{ V}$  is connected across  $240\text{ (ohm)}$  resistance, the power of the load is

- (a)  $240\text{ watts}$
- (b)  $1\text{ watt}$
- (c)  $10\text{ watts}$
- (d)  $480\text{ watts}$

**Ans: (a)**

129. 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)**

130. 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)**

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

**Ans: (a)**

132. 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)**

133. 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)**

134. 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)**

135. 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)**

136. 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)**

137. 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)**

138. 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)**

139. 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)**

140. 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)**

141. 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)**

142. 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)**

143. 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)**

144. 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)**

145. 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)**

146. 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)**

147. 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)**

148. 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  $50\Omega$  at load. What is the new Thevenin equivalent of the network?
- (a) 5V,  $50\Omega$
  - (b) 5V,  $25\Omega$
  - (c) 10V,  $50\Omega$
  - (d) 10V,  $25\Omega$

**Ans: (b)**

149. 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)**
150. 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)**
151. "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)**
152. 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)**
153. 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 are open circuited and all independent current sources are open circuited
- Ans: (a)**
154. Closed circuit techniques are based on
- (a) Superposition theorem
  - (b) Thevenin's theorem
  - (c) Kirchhoff's current law
  - (d) Kirchhoff's voltage law
- Ans: (b)**

155. "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)**

156. The superposition theorem is based on the concept of

- (a) Duality
- (b) Linearity
- (c) Reciprocity
- (d) Non-linearity

**Ans: (b)**

157. Two identical 2A,  $4\Omega$  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)**

158. 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)**

159. 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)**

160. 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)**

161. 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)**

162. 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)**

163. 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)**

164. Which of the following is a unit of reluctance?
- (a) Tesla
  - (b) Henry/Wb
  - (c) At/Wb
  - (d) Wb

**Ans: (c)**

165. 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)**

166. Which of the following factors determine the inductance?
- (a) Number of turns
  - (b) Permeability
  - (c) Coil length
  - (d) All the above

**Ans: (d)**

167. 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)**

168. 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'?
- 1
  - 1.5
  - 2
  - 2.5
- Ans: (a)**
169. Inductive reactance is defined as the opposition offered by the of a circuit to the flow of an alternating sinusoidal current.
- Resistance
  - Inductance
  - Capacitance
  - Voltage
- Ans: (b)**
170. 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.
- 1.25 H
  - 0.90 H
  - 0.10 H
  - 3.21 H
- Ans: (c)**
171. 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 cm<sup>2</sup>.
- $3.6 \times 10^5$  AT/Wb
  - $7.9 \times 10^5$  AT/Wb
  - $7.9 \times 10^8$  AT/Wb
  - $3.6 \times 10^8$  AT/Wb
- Ans: (b)**
172. 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 cm<sup>2</sup> Number of turns: 1000.
- 2.53 H
  - 8.24 H
  - 1.25 H
  - 3.56 H
- Ans: (c)**
173. A 8H choke is carrying a current of 500 mA. The energy supplied by inductor is:
- 2 J
  - 4 J
  - 0.5 J
  - 1 J
- Ans: (d)**

174. 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)**

175. The unit of reluctance is:
- (a) Ampere-tum
  - (b) Ampere-turn/meter
  - (c) Ampere-tum/weber
  - (d) It is dimensionless

**Ans: (c)**

176. 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)**

177. 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)**

178. 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)**

179. 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 monly
  - (d) All of the above

**Ans: (d)**

180. 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)**

181. 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
- 0.8 H
  - 0.4 H
  - 0.2 H
  - 0.1 H
- Ans: (c)**
182. 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?
- 6  $\mu\text{H}$
  - 3.95  $\mu\text{H}$
  - 2  $\mu\text{H}$
  - 1  $\mu\text{H}$
- Ans: (b)**
183. Which of the following terms is analogous to conductivity?
- Inductance
  - Permeability
  - Retentivity
  - Resistivity
- Ans: (b)**
184. 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
- 0.2 H
  - 0.28 H
  - 0.112 H
  - 1 H
- Ans: (b)**
185. 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
- 2H
  - 1H
  - 4H
  - 16H
- Ans: (c)**
186. From source  $V = 200\cos\omega t$ , a load draws current  $i = 2.5\text{A}$  at power factor 0.6 lagging. The load impedance is:
- $(48 + 64j) \Omega$
  - $(40 + 50j) \Omega$
  - $(30 + 64j) \Omega$
  - $(48 + 50j) \Omega$
- Ans: (a)**

187. 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)**

188. 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

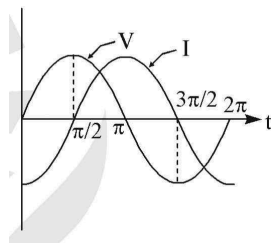
**Ans: (a)**

189. Which of the following circuit will be unity power factor?

- (a) Inductance
- (b) Resistance
- (c) Capacitance
- (d) Inductance and Capacitance

**Ans: (b)**

190. The wave forms shown below indicate:



- (a) V lags I by  $\pi$
- (b) V leads I by  $\pi$
- (c) V lags I by  $\pi/2$
- (d) V leads I by  $\pi/2$

**Ans: (d)**

191. 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)**

192. 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)**

193. 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)**

194. 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)**

195. 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)**

196. 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)**

197. 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)  $105^\circ$
- (b)  $75^\circ$
- (c)  $15^\circ$
- (d)  $60^\circ$

**Ans: (a)**

198. 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)**

199. 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)**

200. An alternating current given by  $i = 14.14 \sin(\omega t + \pi/6)$  has an r.m.s. value of
- 1.96 A
  - 7.07 A
  - 10.0 A
  - 14.14 A
- Ans: (c)**
201. For an RLC series AC circuit, the current at series resonance is
- Maximum at lagging power factor
  - Maximum at leading power factor
  - Maximum at unity power factor
  - Minimum at unity power factor
- Ans: (c)**
202. If  $v = (a + jb)$  and  $i = (c + jd)$ , then active power will be given by
- $ac + ad$
  - $ac + bd$
  - $bc - bd$
  - $ad + bc$
- Ans: (b)**
203. In an RLC series AC circuit, if frequency is below the resonant frequency, then
- $X_c = X_L$
  - $X_c < X_L$
  - $X_c > X_L$
  - None of these
- Ans: (c)**
204. 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
- $30^\circ$
  - $45^\circ$
  - $60^\circ$
  - $36.8^\circ$
- Ans: (b)**
205. In a delta connection, line current lags behind phase current by:
- $30^\circ$
  - $60^\circ$
  - $90^\circ$
  - $120^\circ$
- Ans: (a)**
206. 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
- 13 V
  - 17 V
  - 7 V
  - 2.7 V
- Ans: (a)**

207. 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)**

208. 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)**

209. 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)**

210. 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)**

211. 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)**

212. A parallel RLC circuit has  $R = 10000 \Omega$ ,  $L = 10\text{mH}$  and  $C = 1 \mu\text{F}$ . The resonant frequency  $\omega_0$  (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)**

213. 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)**

214. 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)**

215. 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  $\Omega$
- (b) 48  $\Omega$
- (c) 80  $\Omega$
- (d) 240  $\Omega$

**Ans: (c)**

216. 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)**

217. 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)**

218. 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)**

219. The percentage reactance of a 100 KVA, 100, 5kV is given by:

- (a) 20 %
- (b) 4 %
- (c) 2 %
- (d) 40 %

**Ans: (b)**

220. A resistor of  $100\Omega$  is connected in series with a  $50\mu F$  capacitor at 50 Hz, 200V supply. What is the phase angle and power factor ?

- (a)  $32.48^\circ$ , 0.6365
- (b)  $32.48^\circ$ , 0.8435

- (c) 36.68°, 0.5370
- (d) 32.480, 0.5370

**Ans: (b)**

221. 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)**

222. \_\_\_\_\_ works on the chemical effects of current

- (a) Power factor meter
- (b) Voltmeter
- (c) DC ampere hour meter
- (d) Wattmeter

**Ans: (c)**

223. 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)**

224. The most common used primary cell is

- (a) Lithium cell
- (b) Nickel iron cell
- (c) Lead acid cell
- (d) Nickel cadmium cell

**Ans: (a)**

225. In dry cells, electrons are released at

- (a) Cathode and anode both
- (b) Outside the electrolyte chamber
- (c) Anode
- (d) Cathode

**Ans: (c)**

226. Salt solutions are

- (a) Insulators
- (b) Semi-conductors
- (c) Good conductors of electricity
- (d) Do not possess electrical properties

**Ans: (c)**

227. Positive Electrode of a dry cell is made of

- (a) Copper
- (b) Carbon
- (c) Zinc

(d) Sulphur

**Ans: (b)**

228. Generally the Leclanche cell is used for

- (a) Continuous purposes
- (b) Heavy purposes
- (c) Low purposes
- (d) Intermittent purposes

**Ans: (d)**

229. 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)**

230. Internal resistance of a cell depends on

- (a) Terminal voltage
- (b) Torque
- (c) Current
- (d) Area of the plates

**Ans: (d)**

231. What will be the energy used by the battery if the battery has to deliver  $6.28 \times 10^{18}$  electrons with potential difference of 20 V across the terminal?

- (a) 5 J
- (b) 10 J
- (c) 15 J
- (d) 20 J

**Ans: (d)**

232. 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)**

233. 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)**

234. 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)**

235. A 6V battery is connected to  $300\Omega$  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)**

236. 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)**

237. 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)**

238. The term ampere-hour (Ah) is associated with

- (a) Rectifiers
- (b) Transformers
- (c) Electromagnets
- (d) Storage cells

**Ans: (d)**

239. 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)**

240. 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)**

241. 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)**

242. Which of the following primary cell has the lowest voltage?  
(a) Lithium  
(b) Zinc-chloride  
(c) Mercury  
(d) Carbon-zinc  
**Ans: (c)**
243. 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)**
244. 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)**
245. 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)**
246. 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)**
247. How can we measure the battery capacity in SI units?  
(a) Wh  
(b) Ah  
(c) kWh  
(d) Vh  
**Ans: (b)**
248. 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)**
249. 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)**

250. 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  $2\Omega$ , the power dissipated by the bulb is:
- (a) 80 W
  - (b) 1800 W
  - (c) 112.5 W
  - (d) 147 W
- Ans: (d)**

## **II. ELECTRICAL MACHINES**

251. 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)**
252. 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)**
253. 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)**
254. Skewing of rotor bars eliminates the:
- (a) Effect of cogging
  - (b) Entire effect of crawling
  - (c) Magnetic noise
  - (d) Vibration due to unequal force developed on rotor
- Ans: (a)**
255. 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)**
256. 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)**

257. A 6-pole, 50 Hz, 3- $\Phi$  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)**

258. 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)**

259. 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)**

260. 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)**

261. 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)**

262. 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)**

263. 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)**

264. 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)**

265. 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)**

266. 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)**

267. 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)**

268. 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)**

269. The emf induced in a coil of  $N$  turns is given by

- (a)  $e = N \frac{d\phi}{dt}$



- (b)  $e = -N d\phi/dt$
- (c)  $e = N d\phi/dt$
- (d)  $e = d\phi/dt$

**Ans: (b)**

270. 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)**

271. Compensating winding is used in:

- (a) Capacitor start motor
- (b) Shaded pole motor
- (c) AC series motor
- (d) Capacitor run motor

**Ans: (c)**

272. The three phase induction motor stator windings is displaced by \_ from each other.

- (a)  $45^\circ$  electrical
- (b)  $30^\circ$  electrical
- (c)  $120^\circ$  electrical
- (d)  $90^\circ$  electrical

**Ans: (c)**

273. 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)**

274. 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)**

275. 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)**

276. 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)**

277. 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)**

278. 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)**

279. 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)**

280. 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)**

281. The induced e.m.f. will be maximum when a conductor cuts the magnetic field at an angle of

- (a)  $15^\circ$
- (b)  $30^\circ$
- (c)  $45^\circ$
- (d)  $90^\circ$

**Ans: (d)**

282. 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)**

283. 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)**

284. 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)**

285. An induction machine works at generating mode when slip is:-

- (a) Zero
- (b) 0 -1
- (c) More than one
- (d) Negative

**Ans: (d)**

286. \_\_\_\_\_ braking is generally used in braking of battery operated scooters.

- (a) Plugging
- (b) Regenerative
- (c) Mechanical
- (d) Rheostatic

**Ans: (c)**

287. 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)**

288. 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)**

289. \_\_\_\_\_ 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)**

290. Slip of an induction motor when the rotor starts gaining speed.

- (a) Remains same
- (b) Increases
- (c) Decreases

(d) Increases or decreases

**Ans: (c)**

291. 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)**

292. 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)**

293. 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)**

294. 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**

295. 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)**

296. 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)**

297. 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)**

298. The bearings used to support the rotor shafts are generally

- (a) Ball bearings
- (b) Bush bearings
- (c) Magnetic bearings
- (d) Needle bearings

**Ans: (a)**

299. 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)**

300. 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)**

301. 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)**

302. If rotor resistance in an induction motor is small, rotor current will be:

- (a) Zero
- (b) Low
- (c) Large
- (d) Infinite

**Ans: (c)**

303. Slip of an induction motor when the rotor starts gaining speed:

- (a) Remains same
- (b) Increases
- (c) Decreases
- (d) Increases or decreases

**Ans: (c)**

304. 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)**

305. 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)**
306. 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)**
307. A 3 $\Phi$ , 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)**
308. 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)**
309. 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)**
310. 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)**
311. 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)**
312. 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)**

313. 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)**

314. 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)**

315. 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)**

316. 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)**

317. 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)**

318. 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)**

319. 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)**

320. 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)**

321. 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)**

322. 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)**

323. 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)**

324. 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)**

325. 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)**



326. 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)**
327. 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)**
328. 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)**
329. 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)**
330. 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)**
331. Open circuit test on a transformer gives:
- (a) Total loss
  - (b) Insulation resistance
  - (c) Core loss
  - (d) Cu loss
- Ans: (c)**
332. 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)**
333. A magnetizing force of 800 AT/m will produce a flux density in air.

- (a)  $0.5 \text{ Wb/m}^2$
- (b)  $1 \text{ Wb/m}^2$
- (c)  $10 \text{ mWb/m}^2$
- (d)  $1 \text{ mWb/m}^2$

**Ans: (d)**

334. The rating of transformers is expressed in:

- (a) kVA
- (b) kW
- (c) HP
- (d) kWh

**Ans: (a)**

335. 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)**

336. 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)**

337. 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)**

338. 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)**

339. 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)**

340. 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)**

341. A transformer has negative voltage regulation when its load power factor is

- (a) Zero
- (b) Leading
- (c) Unity
- (d) Lagging

**Ans: (b)**

342. The no load current in a transformer lags the supply voltage by

- (a)  $0^\circ$
- (b)  $90^\circ$
- (c)  $110^\circ$
- (d) about  $75^\circ$

**Ans: (d)**

343. 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)**

344. 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)**

345. 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)**

346. 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)**

347. 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)**

348. 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)**

349. 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)**

350. The transformer laminations are insulated from each other by:
- (a) Mica strip
  - (b) Thin coat of varnish
  - (c) Paper
  - (d) Copper sheets

**Ans: (b)**

351. 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)**

352. 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)**

353. What does the Eddy current loss depend on?
- (a) Flux density
  - (b) Frequency
  - (c) Thickness
  - (d) All of these

**Ans: (d)**

354. 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)**

355. 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)**

356. 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)**

357. 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)**

358. Reason for using silicon steel in electrical machines?

- (a) High retentivity
- (b) High coercivity
- (c) Low hysteresis loss
- (d) Low coercivity

**Ans: (c)**

359. 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)**

360. To minimise loss due to hysteresis, the magnetic material should have?

- (a) High resistivity
- (b) High retentivity
- (c) Low hysteresis coefficient
- (d) Large B-H loop area

**Ans: (c)**

361. 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)**

362. Laminations of core are generally made of  
(a) case iron  
(b) carbon  
(c) silicon steel  
(d) stainless steel  
**Ans: (c)**
363. Which of the following does not change in a transformer?  
(a) Current  
(b) Voltage  
(c) Frequency  
(d) All of the above  
**Ans: (c)**
364. 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)**
365. 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)**
366. 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)**
367. Transformer breathes in when  
(a) Load on it increases  
(b) Load on it decreases  
(c) Load remains constant  
(d) None of the above  
**Ans: (b)**
368. 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)**
369. 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)**

370. 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)**

371. 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)**

372. 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)**

373. 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)**

374. 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)**

375. 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)**

376. 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)**

377. 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)**

378. 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)**

379. A  $1\Phi$ , 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)**

380. 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)**

381. 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)**

382. 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)**

383. 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)**

- 384.** 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)**

- 385.** The full load efficiency at unity power factor of a 230/115 V, 2 kVA single phase transformer having a Cu loss of 60W at half load and iron loss of 50 W is:

- (a) 92%
- (b) 87%
- (c) 90%
- (d) 98%

**Ans: (b)**

- 386.** 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)**

- 387.** 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)**

- 388.** 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)**

- 389.** The percentage resistance of a 100 kVA, 5kV,  $5\Omega$  resistance is given by:

- (a) 2%
- (b) 20%
- (c) 40%
- (d) 4%

**Ans: (a)**

**390.** 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)**

**391.** 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)**

**392.** 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)**

**393.** 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)**

**394.** 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)**

**395.** A 250 V dc motor has an armature resistance of  $0.25\Omega$ . 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)**

**396.** 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)**

397. The poorest voltage regulation exists in case of which of the following generators?
- (a) Compound generators
  - (b) Shunt generators
  - (c) Series generators
  - (d) High generators

**Ans: (c)**

398. 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)**

399. What is the value of flux in the section of yoke, if the pole flux is  $\phi$  weber?

- (a)  $2\phi$
- (b)  $\sqrt{\phi}$
- (c)  $\phi/2$
- (d)  $\phi$

**Ans: (c)**

400. 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)  $N \propto I_a^2$

**Ans: (a)**

401. 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)**

402. 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)**

403. 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)**

404. 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)**

**405.** 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)**

**406.** 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)**

**407.** 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)**

**408.** 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)**

**409.** 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)**

**410.** 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)**

**411.** 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)**

**412.** 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)**

**413.** 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)**

**414.** 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)**

**415.** 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)**

**416.** 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)**

**417.** The speed control of dc 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)**

**418.** The armature resistance of a DC motor is  $0.4\Omega$ , 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)**

**419.** 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)**

**420.** 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)**

**421.** To save energy during braking, which type of braking is used?

(a) Regenerative

(b) Plugging

(c) Dynamic

(d) All of these

**Ans: (a)**

**422.** Which of the following dc generators is employed in arc welding?

(a) Shunt

(b) Cumulative Compound

(c) Series

(d) Differential Compound

**Ans: (d)**

**423.** 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)**

**424.** 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)**

**425.** 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)**

**426.** A shunt generator gives the greatest voltage at

- (a) No-load
- (b) Full-load
- (c) Open field
- (d) Drooping

**Ans: (a)**

**427.** 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)**

**428.** 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)**

**429.** Iron losses in a D.C. machine are independent of variations in

- (a) Speed
- (b) Load
- (c) Voltage
- (d) Speed and voltage

**Ans: (b)**

**430.** Brushes of D.C. machines are made of

- (a) Carbon
- (b) Soft copper
- (c) Hard copper
- (d) All of the above

**Ans: (a)**

**431.** 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)**

**432.** The insulating material used between the commutator segments is normally

- (a) Graphite
- (b) Paper
- (c) Mica
- (d) Insulating varnish

**Ans: (c)**

**433.** 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)**

**434.** 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)**

**435.** 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)**

**436.** 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)**

**437.** A 230 V DC motor takes a current of 40A and runs at 1100 r.p.m. If armature and shunt field

resistances are  $0.25\Omega$  and  $230\Omega$  respectively the back emf will be:

- (a) 220.25 V
- (b) 110.25 V
- (c) 230.25 V
- (d) 115 V

**Ans: (a)**

**438.** 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)**

**439.** 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)**

**440.** 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)**

**441.** 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)**

**442.** 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)**

**443.** 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)**

**444.** 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)**

**445.** ZPF (Zero power factor) method finds \_\_\_\_\_ of an alternator.

- (a) Voltage regulation
- (b) Efficiency
- (c) Armature resistance
- (d) Synchronous impedance

**Ans: (a)**

**446.** 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)**

**447.** 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)**

448. What is the value of load angle at a point where power output of a salient pole synchronous generator is maximum?
- (a)  $0^\circ$
  - (b)  $45^\circ$
  - (c)  $120^\circ$
  - (d) It is less than  $90^\circ$  but not fixed

**Ans: (d)**

449. 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)**

450. 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)**

451. 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)**

452. 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)**

453. 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)**

454. 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)**

- 455.** 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)**

- 456.** 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)**

- 457.** 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)**

- 458.** 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)**

- 459.** 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)**

- 460.** 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)**

- 461.** 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)**

- 462.** The power factor of an alternator is determined by its  
(a) Prime mover  
(b) Speed  
(c) Excitation  
(d) Load  
**Ans: (d)**
- 463.** 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)**
- 464.** 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)**
- 465.** Alternators are rated at:  
(a) kW  
(b) kVA  
(c) kVA or kW  
(d) kWh  
**Ans: (b)**
- 466.** 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)**
- 467.** Which of the following statement 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)**
- 468.** 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)**
- 469.** 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)**

**470.** 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)**

**471.** In which of the following conditions will a 3-phase synchronous machine work as a capacitor?

- (a) Over Excited
- (b) Critically Excited
- (c) Under Excited
- (d) None of these

**Ans: (a)**

**472.** 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)**

**473.** 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)**

**474.** What the damper bars develop, 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)**

**475.** 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)**

**476.** 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)**

**477.** 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)**

**478.** 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)**

**479.** 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)**

**480.** 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)**

**481.** 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)**

**482.** 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)**

**483.** The synchronous motor has

- (a) Constant speed

- (b) Variable speed
- (c) Constant poles
- (d) Constant size

**Ans: (a)**

**484.** 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)**

**485.** 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)**

**486.** 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)**

**487.** Synchronous condenser means

- (a) A synchronous motor with capacitor connected a cross 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)**

**488.** 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)**

**489.** 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)**

**490.** Damper in a large generator is used to:

- (a) Increase stability
- (b) Reduce voltage fluctuation
- (c) Reduce frequency fluctuation
- (d) All above

**Ans: (a)**

**491.** 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)**

**492.** Synchronous generator can reactive power:

- (a) Neither generates nor absorbs
- (b) Absorb
- (c) Generate and absorb
- (d) Generate

**Ans: (c)**

**493.** 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)**

**494.** 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)**

**495.** 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)**

**496.** 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)**

**497.** The speed of two pole alternator at 60 Hz is-



- (a) 3600 rpm
- (b) 750 rpm
- (c) 300 rpm
- (d) 1500 rpm

**Ans: (a)**

**498.** 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)**

**499.** 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)**

**500.** A magnetic flux of 300 m Wb in a coil of 100 turns is reversed in 0.2 seconds. The average emf induced is

- (a) 600 V
- (b) -300 V
- (c) -600 V
- (d) 300 V

**Ans: (d)**

**501.** 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)**

**502.** 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)**

**503.** What is the pitch factor of a 4 pole alternator having 36 slots and a coil span of 1 to 8 ?

- (a)  $140^\circ$
- (b)  $80^\circ$
- (c)  $20^\circ$
- (d)  $40^\circ$

**Ans: (d)**

**504.** 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)**

**505.** 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)**

**506.** 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)**

**507.** 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)**

**508.** 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)**

**509.** Maximum speed of a synchronous machine for 50 Hz is:

- (a) 1500 rpm
- (b) 3000 rpm
- (c) 20000 rpm
- (d) 30000 rpm

**Ans: (b)**

**510.** 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)**

**511.** 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) Kirchhoff's Law

**Ans: (c)**

**512.** 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)**

**513.** 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)**

**514.** 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)**

**515.** \_\_\_\_\_ works on the chemical effects of current

- (a) Power factor meter
- (b) Voltmeter
- (c) DC ampere hour meter
- (d) Wattmeter

**Ans: (c)**

**516.** 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)**

**517.** The most common used primary cell is

- (a) Lithium cell
- (b) Nickel iron cell
- (c) Lead acid cell
- (d) Nickel cadmium cell

**Ans: (a)**

**518.** In dry cells, electrons are released at

- (a) Cathode and anode both

- (b) Outside the electrolyte chamber
- (c) Anode
- (d) Cathode

**Ans: (c)**

**519.** Salt solutions are

- (a) Insulators
- (b) Semi-conductors
- (c) Good conductors of electricity
- (d) Do not possess electrical properties

**Ans: (c)**

**520.** Positive Electrode of a dry cell is made of

- (a) Copper
- (b) Carbon
- (c) Zinc
- (d) Sulphur

**Ans: (b)**

**521.** Generally the Leclanche cell is used for

- (a) Continuous purposes
- (b) Heavy purposes
- (c) Low purposes
- (d) Intermittent purposes

**Ans: (d)**

**522.** 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)**

**523.** Internal resistance of a cell depends on

- (a) Terminal voltage
- (b) Torque
- (c) Current
- (d) Area of the plates

**Ans: (d)**

**524.** What will be the energy used by the battery if the battery has to deliver  $6.28 \times 10^{18}$  electrons with potential difference of 20 V across the terminal?

- (a) 5 J
- (b) 10 J
- (c) 15 J
- (d) 20 J

**Ans: (d)**

**525.** 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)**

**526.** 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)**

**527.** 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)**

**528.** A 6V battery is connected to  $300\Omega$  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)**

**529.** 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)**

**530.** 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)**

**531.** The term ampere-hour (Ah) is associated with

- (a) Rectifiers
- (b) Transformers
- (c) Electromagnets
- (d) Storage cells

**Ans: (d)**

**532.** 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**

- 533.** 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)**
- 534.** 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)**
- 535.** Which of the following primary cell has the lowest voltage?  
(a) Lithium  
(b) Zinc-chloride  
(c) Mercury  
(d) Carbon-zinc  
**Ans: (c)**
- 536.** 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)**
- 537.** 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)**
- 538.** 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)**
- 539.** 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)**

**540.** How can we measure the battery capacity in SI units?

- (a) Wh
- (b) Ah
- (c) kWh
- (d) Vh

**Ans: (b)**

**541.** 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)**

**542.** 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)**

**543.** 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  $2\Omega$ , the power dissipated by the bulb is:

- (a) 80 W
- (b) 1800 W
- (c) 112.5 W
- (d) 147 W

**Ans: (d)**

### **III. ELECTRICAL SYSTEMS AND COMPONENTS**

**544.** 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**

**545.** Which of the following protects a cable against mechanical injury ?

- A. Bedding
- B. Sheath
- C. Armouring
- D. None of the above

**Answer: C**

**546.** Which of the following insulation is used in cables ?

- A. Varnished cambric
- B. Rubber
- C. Paper
- D. All of the above

**Answer: D**

- 547. Empire tape is**  
A. varnished cambric  
B. vulcanised rubber  
C. impregnated paper  
D. none of the above

**Answer: A**

- 548. 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**

- 549. The bedding on a cable consists of**  
A. hessian cloth  
B. jute  
C. All of the above  
D. none of the above

**Answer: C**

- 550. 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**

- 551. In a cable immediately above metallic sheath \_\_\_\_\_ is provided.**  
A. earthing connection  
B. bedding  
C. armouring  
D. none of the above

**Answer: B**

- 552. 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**

- 553. 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**

- 554. cables are used for 132 kV lines.**  
A. High tension  
B. Super tension



- C. Extra high tension
- D. Extra super voltage

**Answer: D**

**555. Conduit pipes are normally used to protect \_\_\_\_\_ cables.**

- A. unsheathed cables
- B. armoured
- C. PVC sheathed cables
- D. all of the above

**Answer: A**

**556. The minimum dielectric stress in a cable is at**

- A. armour
- B. bedding
- C. conductor surface
- D. lead sheath

**Answer: D**

**557. 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**

**558. Dielectric strength of rubber is around**

- A. 5 kV/mm
- B. 15 kV/mm
- C. 30 kV/mm
- D. 200 kV/mm

**Answer: C**

**559. Low tension cables are generally used up to**

- A. 200 V
- B. 500 V
- C. 700 V
- D. 1000 V

**Answer: D**

**560. In a cable, the maximum stress under operating conditions is at**

- A. insulation layer
- B. sheath
- C. armour
- D. conductor surface

**Answer: D**

**561. High tension cables are generally used up to**

- A. 11kV
- B. 33kV
- C. 66 kV
- D. 132 kV

**Answer: A**

**562. The surge resistance of cable is**

- A. 5 ohms
- B. 20 ohms
- C. 50 ohms
- D. 100 ohms

**Answer: C**

**563. PVC stands for**

- A. polyvinyl chloride
- B. post varnish conductor
- C. pressed and varnished cloth
- D. positive voltage conductor

**Answer: A**

**564. 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**

**565. In capacitance grading of cables we use a \_\_\_\_\_ dielectric.**

- A. composite
- B. porous
- C. homogeneous
- D. hygroscopic

**Answer: A**

**566. Pressure cables are generally not used beyond**

- A. 11 kV
- B. 33 kV
- C. 66 kV
- D. 132 kV

**Answer: C**

**567. 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**

**568. Cables, generally used beyond 66 kV are**

- A. oil filled
- B. S.L. type
- C. belted
- D. armoured

**Answer: A**

**569. 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**

- 570. 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**

- 571. 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**

- 572. In cables the charging current**
- A. lags the voltage by  $90^\circ$
  - B. leads the voltage by  $90^\circ$
  - C. lags the voltage by  $180^\circ$
  - D. leads the voltage by  $180^\circ$

**Answer: B**

- 573. 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**

- 574. 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**

- 575. 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**

- 576. 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**

- 577. 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**

- 578. 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**

- 579. 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**

- 580. 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**

- 581. 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**

- 582. 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**

- 583. 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**

- 584. 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**

**585. 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**

**586. 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**

**587. 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**

**588. 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**

**589. Copper as conductor for cables is used as**

- A. annealed
- B. hardened and tempered
- C. hard drawn
- D. alloy with chromium

**Answer: A**

**590. The insulating material should have**

- A. low permittivity
- B. high resistivity
- C. high dielectric strength
- D. all of the above

**Answer: D**

**591. 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**

**592. 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**

**593. 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**

**594. Which of the following does not change in a transformer ?**

- (a) Current
- (b) Voltage
- (c) Frequency
- (d) All of the above

**Answer: c**

**595. 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**

**596. 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**

**597. 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**

**598. 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**

- 599. 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**

- 600. 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**

- 601. The dielectric strength of transformer oil is expected to be**  
(a) 1kV  
(b) 33 kV  
(c) 100 kV  
(d) 330 kV

**Answer: b**

- 602. 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**

- 603. The permissible flux density in case of cold rolled grain oriented steel is around**  
(a) 1.7 Wb/m<sup>2</sup>  
(b) 2.7 Wb/m<sup>2</sup>  
(c) 3.7 Wb/m<sup>2</sup>  
(d) 4.7 Wb/m<sup>2</sup>

**Answer: a**

- 604. 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**

- 605. 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**

- 606. 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**

**607. Which of the following is not a part of transformer installation ?**

- (a) Conservator
- (b) Breather
- (c) Buchholz relay
- (d) Exciter

**Answer: d**

**608. 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**

**609. 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**

**610. A transformer transforms**

- (a) voltage
- (b) current
- (c) power
- (d) frequency

**Answer: c**

**611. 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**

**612. 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**

**613. 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**



**614. 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**

**615. 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**

**616. 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**

**617. The no load current in a transformer lags behind the applied voltage by an angle of about**

- (a)  $180^\circ$
- (b)  $120^\circ$
- (c)  $90^\circ$
- (d)  $75^\circ$

**Answer: d**

**618. 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**

**619. 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**

**620. 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**

**621. 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**

**622. 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**

**623. 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**

**624. 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**

**625. 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**

**626. 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**

**627. 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**

**628. The power transformer is a constant**

- (a) voltage device
- (b) current device
- (c) power device
- (d) main flux device

**Answer: d**

- 629. 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**

- 630. 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)  $R_2/K^2$

**Answer: b**

- 631. 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**

- 632. 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**

- 633. 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**

- 634. 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**

- 635. 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**

**636. The chemical used in breather is**

- (a) asbestos fiber
- (b) silica sand
- (c) sodium chloride
- (d) silica gel

**Answer: d**

**637. An ideal transformer has infinite values of primary and secondary inductances. The statement is**

- (a) true
- (b) false

**Answer: b**

**638. The transformer ratings are usually expressed in terms of**

- (a) volts
- (b) amperes
- (c) kW
- (d) kVA

**Answer: d**

**639. The noise resulting from vibrations of laminations set by magnetic forces, is termed as**

- (a) magnetostriction
- (b) boo
- (c) hum
- (d) zoom

**Answer: c**

**640. 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**

**641. Material used for construction of transformer core is usually**

- (a) wood
- (b) copper
- (c) aluminium
- (d) silicon steel

**Answer: d**

**642. 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**

**643. 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**

**644. The highest voltage for transmitting electrical power in India is**

- (a) 33 kV.
- (b) 66 kV
- (c) 132 kV
- (d) 400 kV

**Answer: d**

**645. In a transformer the resistance between its primary and secondary is**

- (a) zero
- (b) 1 ohm
- (c) 1000 ohms
- (d) infinite

**Answer: d**

**646. A transformer oil must be free from**

- (a) sludge
- (b) odour
- (c) gases
- (d) moisture

**Answer: d**

**647. A Buchholz relay can be installed on**

- (a) auto-transformers
- (b) air-cooled transformers
- (c) welding transformers
- (d) oil cooled transformers

**Answer: d**

**648. 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**

**649. 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**

**650. Distribution transformers are generally designed for maximum efficiency around**

- (a) 90% load
- (b) zero load
- (c) 25% load
- (d) 50% load

**Answer: d**

**651. 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**

**652. 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**

**653. 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**

**654. 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**

**655. 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**

**656. Which of the following does not change in an ordinary transformer ?**

- (a) Frequency
- (b) Voltage
- (c) Current
- (d) Any of the above

**Answer: a**

**657. 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**

- 658. 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**

- 659. The path of the magnetic flux in transformer should have**  
(a) high reluctance  
(b) low reactance  
(c) high resistance  
(d) low resistance

**Answer: b**

- 660. Noise level test in a transformer is a**  
(a) special test  
(b) routine test  
(c) type test  
(d) none of the above

**Answer: c**

- 661. 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**

- 662. 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**

- 663. 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**

- 664. 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**

- 665. 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**

- 666. 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**

- 667. 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**

- 668. Silicon steel used in laminations mainly reduces**
- (a) hysteresis loss
  - (b) eddy current losses
  - (c) copper losses
  - (d) all of the above

**Answer: a**

- 669. 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**

- 670. 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**

- 671. 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**

- 672. 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**



- 673. 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**

- 674. 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**

- 675. 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**

- 676. 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**

- 677. 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**

- 678. 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**

- 679. 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**

**680. 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**

**681. 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**

**682. 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**

**683. 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**

**684. 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**

**685. 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**

**686. Open circuit test on transformers is conducted to determine**

- (a) hysteresis losses
- (b) copper losses
- (c) core losses
- (d) eddy current losses

**Answer: c**

**687. Short circuit test on transformers is conducted to determine**

- (a) hysteresis losses
- (b) copper losses
- (c) core losses
- (d) eddy current losses

**Answer: b**

**688. 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**

**689. The transformer oil should have \_\_\_\_\_ volatility and \_\_\_\_\_ viscosity.**

- (a) low,low
- (b) high,high
- (c) low,high
- (d) high,low

**Answer: a**

**690. 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**

**691. 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**

**692. 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**

**693. 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**

**694. 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**

**695. 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**

**696. A transformer transforms**

- (a) voltage
- (b) current
- (c) current and voltage
- (d) power

**Answer: d**

**697. 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**

**698. 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**

**699. 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**

**700. 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**

**701. 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**

**702. 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**

**703. 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**

**704. 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**

**705. In a transformer the resistance between its primary and secondary should be**

- (a) zero
- (b) 10  $\Omega$
- (c) 1000  $\Omega$
- (d) infinity

**Answer: d**

**706. 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**

**707. 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**

**708. 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**

**709. 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**

**710. 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**

**711. Which of the following insulating materials can withstand the highest temperature safely ?**

- (a) Cellulose
- (b) Asbestos
- (c) Mica
- (d) Glass fibre

**Answer: c**

**712. Which of the following parts of a transformer is visible from outside ?**

- (a) Bushings
- (b) Core
- (c) Primary winding
- (d) Secondary winding

**Answer: a**

**713. The noise produced by a transformer is termed as**

- (a) zoom
- (b) hum
- (c) ringing
- (d) buzz

**Answer: b**

**714. 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**

**715. 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**

**716. 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**

**717. The hum in a transformer is mainly attributed to**

- (a) load changes
- (b) oil in the transformer
- (c) magnetostriction
- (d) mechanical vibrations

**Answer: c**

**718. 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**

**719. 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**

**720. 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**

**721. 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**

**722. 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**

- 723. 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**

- 724. 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**

- 725. 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**

- 726. Minimum voltage regulation occurs when the power factor of the load is**  
(a) unity  
(b) lagging  
(c) leading  
(d) zero

**Answer: c**

- 727. 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**

- 728. 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**

- 729. 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**



**730. 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

**731. SF6 gas**

- (a) is yellow in colour
- (b) is lighter than air
- (c) is nontoxic
- (d) has pungent smell

Ans: c

**732. The arcing contacts in a circuit breaker are made of**

- (a) copper tungsten alloy
- (b) porcelain
- (c) electrolytic copper
- (d) aluminium alloy

Ans: a

**733. Which of the following medium is employed for extinction of arc in air circuit breaker ?**

- (a) Water
- (b) Oil
- (c) Air
- (d) SF6

Ans: c

**734. 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

**735. Fault diverters are basically**

- (a) fuses
- (b) relays
- (c) fast switches
- (d) circuit breakers

Ans: c

**736. A thermal protection switch can protect against**

- (a) short-circuit
- (b) temperature
- (c) overload
- (d) over voltage

Ans: c

**737. 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

- 738. Thermal circuit breaker has**
- (a) delayed trip action
  - (b) instantaneous trip action
  - (c) both of the above
  - (d) none of the above

Ans: a

- 739. 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

- 740. Overload relays are of..... type.**
- (a) induction
  - (b) thermal
  - (c) electromagnetic
  - (d) all above

Ans: d

- 741. 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

- 742. Magnetic circuit breaker has \_\_\_\_\_ trip action.**
- (a) delayed
  - (b) instantaneous
  - (c) both of the above
  - (d) none of the above

Ans: b

- 743. 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

- 744. 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

**745. 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

**746. 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

**747. 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

**748. 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

**749. Air blast circuit breaker is used for**

- (a) over currents
- (b) short duty
- (c) intermittent duty
- (d) repeated duty

Ans: d

**750. 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

**751. 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

**752. Directional relays are based on flow of**

- (a) power
- (b) current

- (c) voltage wave
- (d) all of the above

Ans:

**753. 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

**754. 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

**755. 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

**756. 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

**757. 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

**758. 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

**759. 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

**760. 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

**761. 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

**762. 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

**763. 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

**764. The arc voltage produced in A.C. circuit breaker is always**

- (a) in phase with the arc current
- (b) lagging the arc current by  $90^\circ$
- (c) leading the arc current by  $90^\circ$
- (d) none of the above

Ans: a

**765. 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

**766. 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

**767. H.R.C. fuses provide best protection against**

- (a) overload
- (b) reverse current

- (c) open-circuits
- (d) short-circuits

Ans: d

**768. The ground wire should not be smaller than No \_\_\_\_\_ copper.**

- (a) 2
- (b) 4
- (c) 6
- (d) 10

Ans: d

**769. The delay fuses are used for the protection of \_\_\_\_\_ .**

- (a) motors
- (b) power outlet circuits
- (c) fluorescent lamps
- (d) light circuits

Ans: a

**770. Which of the following is the least expensive protection for overcurrent in low voltage system ?**

- (a) Rewireable fuse
- (b) Isolator
- (c) Oil circuit breaker
- (d) Air break circuit breaker

Ans: a

**771. Resistance grounding is used for voltage between**

- (a) 33kV to 66kV
- (b) 11kV to 33kV
- (c) 3.3kV and 11kV
- (d) none of the above

Ans: c

**772. 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

**773. 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

**774. 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

- 775. Ungrounded neutral transmission system is not recommended because of system**
- (a) insulation being overstressed due to over voltages
  - (b) insulation over stress may lead to failure and subsequent phase to phase faults
  - (c) being inadequately protected against ground fault
  - (d) all of the above

Ans: d

- 776. The reflection co-efficient at the open circuited end of a transmission line.**
- (a) zero
  - (b) infinity
  - (c) unity
  - (d) none of the above

Ans: c

- 777. 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

- 778. 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

- 779. 52. 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 trans-mission line tower
  - (c) increasing the distance between the two lines
  - (d) all of the above

Ans: d

- 780. 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

- 781. 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

**782. 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

**783. Induction cup relay is operated due to changes in**

- (a) current
- (b) voltage
- (c) impedance
- (d) all of the above

Ans: d

**784. 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

**785. 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  $(1.8 \times V_2)$  times the A.C. component
- (d) The MVA at fault is equal to base MVA divided by per unit equivalent fault reactance

Ans: a

**786. 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

**787. To reduce short circuit fault currents are used.**

- (a) reactors
- (b) resistors
- (c) capacitors
- (d) none of the above

Ans: a

**788. 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



- 789. For cost and safety, the outdoor substations are installed for voltages above**  
(a) 11 kV  
(b) 33 kV  
(c) 60kV  
(d) 110kV

Ans: b

- 790. 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

- 791. 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

- 792. For which of the following protection from negative sequence currents is provided ?**  
(a) Generators  
(b) Motors  
(c) Transmission line  
(d) Transformers

Ans: a

- 793. relay is preferred for phase fault on short transmission line.**  
(a) Induction type  
(b) Reactance  
(c) Impedance  
(d) None of the above

Ans: b

- 794. Distance relays are generally**  
(a) split-phase relays  
(b) reactance relays  
(c) impedance relays  
(d) none of the above

Ans: d

- 795. 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

- 796. A \_\_\_\_\_ is used to measure the stator % winding temperature of the generator.**  
(a) thermocouple  
(b) pyrometer  
(c) resistance thermometer  
(d) thermometer

Ans: c

- 797. The under voltage relay can be used for**  
(a) generators  
(b) busbars  
(c) transformers  
(d) all of the above

Ans: d

- 798. 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

- 799. 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

- 800. 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

- 801. Which of the following parameter can be neglected for a short line ?**  
(a) Inductance  
(b) Capacitance  
(c) Resistance  
(d) Reactance

Ans: b

- 802. Series reactors should have**  
(a) low resistance  
(b) high resistance  
(c) low impedance  
(d) high impedance

Ans: a

**803. Which of the following circuit breakers has high reliability and minimum maintenance ?**

- (a) Air blast circuit breakers
- (b) Circuit breaker with SF<sub>6</sub> gas
- (c) Vacuum circuit breakers
- (d) Oil circuit breakers

Ans: b

**804. Arc in a circuit breaker is interrupted at**

- (a) zero current
- (b) maximum current
- (c) minimum voltage
- (d) maximum voltage

Ans: a

**805. transmission line has reflection coefficient as one.**

- (a) Open circuit
- (b) Short-circuit
- (c) Long
- (d) None of the above

Ans: a

**806. 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

**807. 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

**808. 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

**809. 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

- 810. 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

- 811. 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

- 812. Admittance relay is \_\_\_\_\_ relay.**  
(a) impedance  
(b) directional  
(c) non-directional  
(d) none of the above

Ans: b

- 813. 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

- 814. 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

- 815. 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

- 816. 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

**817. 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

**818. The power loss is an important factor for the design of**

- (a) transmission line
- (b) motor
- (c) generator
- (d) feeder

Ans: a

**819. 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

**820. 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

**821. The fuse rating is expressed in terms of**

- (a) current
- (b) voltage
- (c) VAR
- (d) kVA

Ans: a

**822. The fuse blows off by**

- (a) burning
- (b) arcing
- (c) melting
- (d) none of the above

Ans: c

**823. 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

**824. 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

**825. 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

**826. Protection by fuses is generally not used beyond**

- (a) 20 A
- (b) 50 A
- (c) 100 A
- (d) 200 A

Ans: c

**827. 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

**828. 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

**829. 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

**830. 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

**831. By which of the following methods 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

**832. A short-circuit is identified by**

- (a) no current flow
- (b) heavy current flow
- (c) voltage drop
- (d) voltage rise

Ans: b

**833. 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

**834. 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

**835. 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

**836. 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

**837. The use of \_\_\_\_\_ instrument is merely confined within laboratories as standardizing instruments.**

- (a) absolute
- (b) indicating
- (c) recording
- (d) integrating

Ans: a

**838. 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

**839. \_\_\_\_\_ 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

**840. Which of the following are integrating instruments?**

- (a) Ammeters
- (b) Voltmeters
- (c) Wattmeters
- (d) Ampere-hour and watt-hour meters

Ans: d

**841. 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

**842. 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

**843. 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



**844. 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**

**845. 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**

**846. 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**

**847. 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**

**848. 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**

**849. 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**

**850. An induction meter can handle current upto**

- (a) 10 A
- (b) 30 A
- (c) 60 A
- (d) 100 A

**Ans: d**

**851. 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**

**852. 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**

**853. 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**

**854. 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**

**855. 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**

**856. 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**

**857. 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**

**858. The household energy meter is**

- (a) an indicating instrument
- (b) a recording instrument
- (c) an integrating instrument
- (d) none of the above

**Ans: c**

**859. 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**

**860. 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**

**861. In majority of instruments damping is provided by**

- (a) fluid friction
- (b) spring
- (c) eddy currents
- (d) all of the above

**Ans: c**

**862. An ammeter is a**

- (a) secondary instrument
- (b) absolute instrument
- (c) recording instrument
- (d) integrating instrument

**Ans: a**

**863. In a portable instrument, the controlling torque is provided by**

- (a) spring
- (b) gravity
- (c) eddy currents
- (d) all of the above

**Ans: a**

**864. 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**

**865. 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**

**866. 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**

**867. 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**

**868. 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**

**869. The scale of a rectifier instrument is**

- (a) linear
- (b) non-linear
- (c) either (a) or (b)
- (d) neither (a) nor (b)

**Ans: a**

**870. 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**

**871. 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**

**872. 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**

**873. 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**

**874. 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**

**875. 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**

**876. 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**

**877. 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**

**878. 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**

**879. 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**

**880. An ohmmeter is a**

- (a) moving iron instrument
- (b) moving coil instrument
- (c) dynamometer instrument
- (d) none of the above

**Ans: b**

**881. 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**

**882. 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**

**883. 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**

**884. In a megger controlling torque is provided by**

- (a) spring
- (b) gravity
- (c) coil
- (d) eddy current

**Ans: c**

**885. The operating voltage of a meggar is about**

- (a) 6 V
- (b) 12 V
- (c) 40 V
- (d) 100 V

**Ans: d**

**886. 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**

**887. 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**

**888. 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**

**889. 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**

**890. 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**

**891. 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**

**892. 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**

**893. 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**

**894. 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**

**895. 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**

**896. 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**

**897. In an AC. co-ordinate potentiometer, the currents in the phase and quadrature potentiometer are adjusted to be**

- (a) out of phase by  $90^\circ$
- (b) out of phase by  $60^\circ$
- (c) out of phase by  $30^\circ$
- (d) out of phase by  $0^\circ$
- (e) out of phase by  $180^\circ$

**Ans: a**



**898. 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**

**899. 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**

**900. 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**

**901. 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**

**902. 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**

**903. 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**

**904. If the current in a capacitor leads the voltage by  $80^\circ$ , the loss angle of the capacitor is**

- (a)  $10^\circ$
- (b)  $80^\circ$
- (c)  $120^\circ$
- (d)  $170^\circ$

**Ans: a**

**905. 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**

**906. 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**

**907. 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**

**908. 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**

**909. 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**

**910. In a single phase power factor meter the phase difference between the currents in the two pressure coils is**

- (a) exactly  $0^\circ$
- (b) approximately  $0^\circ$
- (c) exactly  $90^\circ$
- (d) approximately  $90^\circ$

**Ans: c**

**911. In a dynamometer 3-phase power factor meter, the planes of the two moving coils are at**

- (a)  $0^\circ$
- (b)  $60^\circ$
- (c)  $90^\circ$
- (d)  $120^\circ$

**Ans: d**

**912. 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**

**913. In a Weston frequency meter, the magnetic axes of the two fixed coils are**

- (a) parallel
- (b) perpendicular
- (c) inclined at  $60^\circ$
- (d) inclined at  $120^\circ$

**Ans: b**

**914. Weston frequency meter is**

- (a) moving coil instrument
- (b) moving iron instrument
- (c) dynamometer instrument
- (d) none of the above

**Ans: b**

**915. A Weston synchronoscope is a**

- (a) moving coil instrument
- (b) moving iron instrument
- (c) dynamometer instrument
- (d) none of the above

**Ans: c**

**916. 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**

**917. 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**

**918. 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**

**919. 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**

**920. 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**

**921. Systematic errors are**

- (a) instrumental errors
- (b) environmental errors
- (c) observational errors
- (d) all of the above

**Ans: d**

**922. Standard resistor is made from**

- (a) platinum
- (b) maganin
- (c) silver
- (d) nichrome

**Ans: b**

**923. Commonly used standard capacitor is**

- (a) spherical type
- (b) concentric cylindrical type
- (c) electrostatic type
- (d) multilayer parallel plate type

**Ans: b**

**924. 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**

**925. Commonly used instruments in power system measurement are**

- (a) induction
- (b) moving coil or iron
- (c) rectifier
- (d) electrostatic

**Ans: a**

**926. 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**

**927. 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**

**928. 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**

**929. 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**

**930. 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**

**931. 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**

- 932. 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**

- 933. The rectifier instrument is not free from**  
(a) temperature error  
(b) wave shape error  
(c) frequency error  
(d) all of the above

**Ans: c**

- 934. Alternating current is measured by**  
(a) induction ammeter  
(b) permanent magnet type ammeter  
(c) electrostatic ammeter  
(d) moving iron repulsion type voltmeter

**Ans: a**

- 935. Most sensitive galvanometer is**  
(a) elastic galvanometer  
(b) vibration galvanometer  
(c) Duddlb galvanometer  
(d) spot ballistic galvanometer

**Ans: d**

- 936. Instrument transformers are**  
(a) potential transformers  
(b) current transformers  
(c) both (a) and (b)  
(d) power transformers

**Ans: c**

- 937. 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**

- 938. Wattmeter cannot be designed on the principle of**  
(a) electrostatic instrument  
(b) thermocouple instrument  
(c) moving iron instrument  
(d) electrodynamic instrument

**Ans: c**

- 939. 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**

- 940. 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**

- 941. 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**

- 942. 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**

- 943. 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**

- 944. 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**

- 945. 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**

**946. 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**

**947. 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**

**948. 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**

**949. What type of material is commonly used for the construction of surge arresters?**

- A. Copper
- B. Aluminum
- C. Silicon
- D. Zinc

**Answer: C**

**950. 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**

**951. 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**



- 952. 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**

- 953. 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**

- 954. 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**

- 955. 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**

- 956. 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**

- 957. 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**

- 958. 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**

**959. 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**

**960. 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**

**961. 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**

**962. 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**

**963. 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**

**964. 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**

**965. 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**

- 966. 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**

- 967. 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**

- 968. 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**

- 969. 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**

- 970. 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**

- 971. 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**

- 972. 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**

- 973. 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**

- 974. 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**

- 975. 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**

- 976. 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**

- 977. 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**

**978. 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**

**979. 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**

**980. 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**

**981. 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**

**982. 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**

**983. 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**

**984. 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

**985. “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

**986. 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

**987. 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

**988. 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

**989. 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

**990. 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

**991. 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

**992. 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

**993. 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

**994. 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

**995. 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

**996. 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

**997. 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

**998. 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

**999. 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

**1000. 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

**1001. 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



**1002. 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

**1003. 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

**1004. 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

**1005. 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

**1006. 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

**1007. How does the “thermal disconnecter” feature enhance surge arrester safety?**

- A. Thermal disconnecter accelerates follow current.
- B. Thermal disconnecter has no impact on safety.
- C. Thermal disconnecter disconnects the arrester in case of overheating, preventing potential hazards.
- D. Thermal disconnecter determines the sparkover voltage.

Answer: C

**1008. 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

**1009. 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

**1010. 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

**1011. 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

**1012. 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

**1013. 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

**1014. 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

**1015. 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

**1016. 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

**1017. 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

**1018. 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

**1019. 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

**1020. 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

**1021. 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

**1022. 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

**1023. 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

**1024. 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

- 1025. 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
- 1026. 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
- 1027. 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
- 1028. 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
- 1029. 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

**1030. 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

**1031. 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

**1032. 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

**1033. 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

**1034. 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

**1035. 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

**1036. 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

**1037. 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

**1038. 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

**1039. 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

**1040. 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

**1041. 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

**1042. 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

**1043. 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

**1044. 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

**1045. 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



**1046. 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

**1047. 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

**1048. 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

**1049. 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

**1050. 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

- 1051. 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

- 1052. 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

- 1053. 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

- 1054. 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

- 1055. 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

**1056. “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**

**1057. 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**

**1058. 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  $\text{H}_2\text{SO}_4$  decreases

**Answer: A**

**1059. 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**

**1060. 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**

**1061. 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**

**1062. 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**

**1063. 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**

**1064. 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**

**1065. 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**

**1066. 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**

**1067. 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**

**1068. 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**

**1069. 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**

**1070. 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**

**1071. 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**

**1072. 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**

**1073. A dead storage battery can be revived by**

- A. adding distilled water
- B. adding so-called battery restorer
- C. a dose of  $\text{H}_2\text{SO}_4$
- D. none of the above

**Answer: D**

**1074. 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**

**1075. 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**

**1076. 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**

**1077. In a lead-acid cell dilute sulfuric acid (electrolyte) approximately comprises the following**

- A. one part H<sub>2</sub>O, three parts H<sub>2</sub>SO<sub>4</sub>
- B. two parts H<sub>2</sub>O, two parts H<sub>2</sub>SO<sub>4</sub>
- C. three parts H<sub>2</sub>O, one part H<sub>2</sub>SO<sub>4</sub>
- D. all H<sub>2</sub>SO<sub>4</sub>

**Answer: C**

**1078. 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<sub>2</sub>SO<sub>4</sub> is increased
- D. all of the above

**Answer: D**

**1079. It is noticed that during discharging the following does not happen**

- A. both anode and cathode become PbSO<sub>4</sub>
- B. specific gravity of H<sub>2</sub>SO<sub>4</sub> decreases
- C. voltage of the cell decreases
- D. the cell absorbs energy

**Answer: D**

**1080. 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**

**1081. 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**

**1082. The capacity of a lead-acid cell is measured in**

- A. amperes
- B. ampere-hours
- C. watts
- D. watt-hours

**Answer: B**

**1083. The capacity of a lead-acid cell depends on**

- A. rate of discharge
- B. temperature
- C. density of electrolyte
- D. all above

**Answer: D**

**1084. When the lead-acid cell is fully charged, the electrolyte assumes \_\_\_\_\_ appearance**

- A. dull
- B. reddish
- C. bright
- D. milky

**Answer: D**

**1085. 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**

**1086. 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**

**1087. 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**

**1088. On the average the ampere-hour efficiency of an Edison cell is about**

- A. 40%
- B. 60%
- C. 70%
- D. 80%

**Answer: D**

**1089. 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**

**1090. Lead-acid cell has a life of nearly charges and discharges**

- A. 500
- B. 700
- C. 1000
- D. 1250

**Answer: D**

**1091. Life of the Edison cell is at least**

- A. five years
- B. seven years
- C. eight years
- D. ten years

**Answer: A**

**1092. 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**

**1093. Electrolyte used in an Edison cell is**

- A. NaOH
- B. KOH
- C. HCl
- D. HNO<sub>3</sub>

**Answer: B**

**1094. Electrolyte used in a lead-acid cell is**

- A. NaOH
- B. only H<sub>2</sub>SO<sub>4</sub>
- C. only water
- D. dilute H<sub>2</sub>SO<sub>4</sub>

**Answer: D**

**1095. Negative plate of an Edison cell is made of**

- A. copper
- B. lead
- C. iron
- D. silver oxide

**Answer: C**

**1096. 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**

**1097. The specific gravity of electrolyte is measured by**

- A. manometer
- B. a mechanical gauge
- C. hydrometer
- D. psychrometer

**Answer: C**



**1098. 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**

**1099. 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**

**1100. 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**

**1101. 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**

**1102. 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**

**1103. The effect of sulphation is that the internal resistance**

- A. increases
- B. decreases
- C. remains same
- D. none of the above

**Answer: A**

**1104. 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**

**1105. 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**

**1106. 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**

**1107. 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**

**1108. 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**

**1109. 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**

**1110. 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**

**1111. 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**

**1112. 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**

**1113. 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**

**1114. 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**

**1115. 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**

**1116. Batteries are charged by**

- A. rectifiers
- B. engine generator sets
- C. motor generator sets
- D. any one of the above methods

**Answer: D**

**1117. Cell short circuit results in**

- A. low sp. gravity electrolyte
- B. abnormal high temperature
- C. reduced gassing on charge
- D. all above

**Answer: D**

**1118. 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**

**1119. 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**

**1120. Battery container should be acid resistance, therefore it is made up of**

- A. glass
- B. plastic
- C. wood
- D. all above

**Answer: D**

**1121. 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**

**1122. 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**

**1123. 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**

**1124. 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**

**1125. 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**

**1126. 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**

**1127. 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**

**1128. 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**

**1129. 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**

**1130. 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**

**1131. 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**

**1132. 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**

**1133. The current flow through electrolyte is due to the movement of**

- A. ions
- B. holes
- C. electrons
- D. none of the above

**Answer: A**

**1134. 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**

**1135. During discharge, the active material of both the positive and negative plates is changed to**

- A. Pb
- B. PbO<sub>2</sub>
- C. PbO
- D. PbSO<sub>4</sub>

**Answer: D**

**1136. \_\_\_\_\_ of electrolyte indicates the state of charge of the battery**

- A. colour
- B. mass
- C. viscosity
- D. specific gravity

**Answer: D**

**1137. 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**

**1138. Dry cell is modification of**

- A. Daniell cell
- B. Leclanche cell
- C. Lead-acid cell
- D. Edison cell

**Answer: B**

**1139. Capacity of a battery is expressed in**

- A. Ah
- B. Vh
- C. Wh
- D. kWh

**Answer: A**

**1140. In alkaline cell the electrolyte is**

- A. dilute sulphuric acid
- B. concentrated sulphuric acid
- C. NaOH
- D. KOH

**Answer: D**

**1141. 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**

**1142. Ampere hour capacity of an industrial battery is based on \_\_\_\_\_ hours discharge rate.**

- A. 8
- B. 12
- C. 16
- D. 24

**Answer: A**

**1143. The body of Edison cell is made of**

- A. bakelite
- B. rubber
- C. nickel plated steel
- D. aluminium

**Answer: C**

**1144. Specific gravity of electrolyte in Edison cell is**

- A. 0.8
- B. 0.95
- C. 1.1
- D. 1.21

**Answer: D**

**1145. 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**

**1146. 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**

**1147. 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**

**1148. Charging of sulphated battery produces \_\_\_\_ heat.**

- A. no
- B. very little
- C. less
- D. more

**Answer: D**

**1149. Hydrogen evolved during charging produces explosive mixture when it is more than**

- A. 2%
- B. 4%
- C. 6%
- D. 8%

**Answer: D**

**1150. Weston standard cell at 20°C has voltage of \_\_\_\_ volts.**

- A. 0.8
- B. 0.9
- C. 1.0187
- D. 1.5

**Answer: C**

**1151. 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**

**1152. 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**

**1153. 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**

**1154. 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**



**1155. 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**

**1156. 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**

**1157. Which of the following primary cells has the lowest voltage ?**

- A. Lithium
- B. Zinc-chloride
- C. Mercury
- D. Carbon-zinc

**Answer: C**

**1158. Which of the following primary cells has the highest voltage ?**

- A. Manganese-alkaline
- B. Carbon-zinc
- C. Lithium
- D. Mercury

**Answer: C**

**1159. 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**

**1160. 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**

**1161. Which of the following cell has a reversible chemical reaction ?**

- A. Lead-acid
- B. Mercury oxide
- C. Carbon-zinc
- D. Silver-oxide

**Answer: A**

**1162. 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**

**1163. Which of the following has lower sp. gravity V**

- A. Dilute  $\text{H}_2\text{SO}_4$
- B. Concentrated  $\text{H}_2\text{SO}_4$
- C. Water
- D. Any of the above

**Answer: C**

**1164. 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**

**1165. 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**

**1166. A typical output of a solar cell is**

- A. 0.1V
- B. 0.26 V
- C. 1.1 V
- D. 2 V

**Answer: B**

**1167. 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**

**1168. 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**

**1169. The common impurity in the electrolyte of lead-acid battery is**

- A. chlorine
- B. dust particles
- C. lead crystals
- D. iron

**Answer: D**

**1170. 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**

**1171. 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**

**1172. 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**

**1173. 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**

**1174. A constant-voltage generator has**

- A. minimum efficiency
- B. minimum current capacity
- C. low internal resistance
- D. high internal resistance

**Answer: C**

**1175. Satellite power requirement is provided through**

- A. solar cells
- B. dry cells
- C. nickel-cadmium cells
- D. lead-acid batteries

**Answer: A**

**1176. 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

**1177. 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

**1178. 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

**1179. 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

**1180. 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

**1181. 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

**1182. 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

**1183. 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

**1184. 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

**1185. 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

**1186. 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

**1187. 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

**1188. 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

**1189. 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

**1190. 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

**1191. 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

**1192. 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

**1193. 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

**1194. 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

**1195. 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

**1196. 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

**1197. 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

**1198. 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

**1199. 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

**1200. 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

**1201. 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

**1202. 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

**1203. 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

**1204. 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



**1205. 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

**1206. 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

**1207. 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

**1208. 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

**1209. 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

**1210. 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

**1211. 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

**1212. 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

**1213. 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

**1214. 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

**1215. 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

**1216. 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

**1217. 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

**1218. 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

**1219. 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

**1220. 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

**1221. 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

**1222. 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

**1223. 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

**1224. 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

**1225. 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

**1226. 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

**1227. 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

**1228. 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

**1229. 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

**1230. 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

**1231. 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

**1232. 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

**1233. 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

**1234. 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

**1235. 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

**1236. 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

**1237. 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

**1238. 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

**1239. 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

**1240. 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

**1241. 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

**1242. 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

**1243. 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

**1244. 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

**1245. 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

**1246. 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

**1247. 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

**1248. 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

**1249. 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



**1250. 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

**1251. 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

**1252. 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

**1253. 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

**1254. 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

**1255. 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

**1256. 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

**1257. 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

**1258. 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

**1259. 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

**1260. 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

**1261. 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

**1262. 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

**1263. 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

**1264. 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

**1265. 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

**1266. 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

**1267. 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

**1268. 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

**1269. 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

**1270. 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

**1271. 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

**1272. 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

**1273. 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

**1274. 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

**1275. 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**

**1276. 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**

**1277. The resistance of earth should be \_\_\_\_.**

- A. low
- B. high
- C. the minimum possible
- D. infinite

**Ans.: C**

**1278. 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**

**1279. When moisture falls below \_\_\_\_, resistivity of earth increase sharply.**

- A. 20%
- B. 40%
- C. 50%
- D. 10%

**Ans.: A**

**1280. Earth electrodes can be in the form of \_\_\_\_.**

- A. pipe, plate
- B. strip
- C. wire
- D. all of the above

**Ans.: D**

**1281. Earthing is necessary to give protection against \_\_\_\_.**

- A. Electric shock
- B. voltage fluctuation
- C. over loading
- D. none of the above

**Ans.: A**

**1282. The earth wire should not be size than**

- A. 20 SWG
- B. 10 SWG
- C. 25 SWG
- D. 5 SWG

**Ans.: B**

**1283. The earth wire should be of \_\_\_\_.**

- A. mechanically strong
- B. good conductor of electricity
- C. mechanically strong
- D. A and B

**Ans.: D**

**1284. 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**

**1285. 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**

**1286. Earth wire is made up of\_\_.**

- A. Copper
- B. Aluminium
- C. Galvanized steel
- D. Silver

**Ans.: C**

**1287. The earth potential is taken as\_\_.**

- A. high
- B. low
- C. infinite
- D. zero

**Ans.: D**

**1288. \_\_\_\_\_ 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**

**1289. 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**

**1290. 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**

**1291. 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**

**1292. The effect of an electric shock is/are \_\_\_\_.**

- A. cause death
- B. skin burns
- C. Neurological effect
- D. All of the above

**Ans.: D**

**1293. 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**

**1294. \_\_\_\_ 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**

**1295. 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**

**1296. Q.22 \_\_\_\_ color of wire is used for earthing.**

- A. Red
- B. Blue
- C. Black
- D. Green

**Ans.: D**

**1297. 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**



**1298. 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**

**1299. \_\_\_\_ 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**

**1300. 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**

**1301. \_\_\_\_ 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**

**1302. If moisture of earth is increases then earth resistance is \_\_\_\_.**

- A. Decrease
- B. Increases
- C. cannot changes
- D. none of the above

**Ans.: D**

**1303. 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**

**1304. Average resistance of human**

- A. 1000 Ohms
- B. 5000 ohms
- C. 10 ohms
- D. 100 ohms

**Ans.: A**

**1305. 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**

**1306. 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**

**1307. The body can tolerate \_\_\_\_\_ direct current than alternating current at 50 Hz.**

- A. lower
- B. same
- C. higher
- D. can't decide

**Ans.: C**

**1308. The current higher than \_\_\_\_\_ , dangerous for human body.**

- A. 10 mA
- B. 20 mA
- C. 100 mA
- D. 60 mA

**Ans.: D**

**1309. 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**

**1310. 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**

**1311. The lower the resistivity \_\_\_\_ the earthing resistance.**

- A. higher
- B. lower
- C. cannot change
- D. none of the above

**Ans.: B**

**1312. 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**

**1313. 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**

**1314. Resistivity of concrete becomes approximately equal to \_\_\_\_\_  $\Omega\text{cm}$  at 20°C under the ground which is less than the average earth resistivity.**

- A. 5000
- B. 1000
- C. 3000
- D. 2500

**Ans.: C**

**1315. 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**

**1316. 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**

**1317. 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**

**1318. The size of the earth continuity conductor should not be less than \_\_\_\_.**

- A. 14 SWG (2.894 mm<sup>2</sup>)
- B. 28 SWG
- C. 15 SWG
- D. 8 SWG

**Ans.: A**

**1319. 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**

**1320. 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**

**1321. 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**

**1322. 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**

**1323. 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**

**1324. 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**

**1325. 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**

**1326. In pipe earthing, \_\_\_\_\_ pipe is used.**

- A. galvanized iron
- B. aluminium
- C. iron
- D. any of the above

**Ans.: A**

**1327. 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**

**1328. 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**

**1329. 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**

**1330. 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**

**1331. 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**

**1332. 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**

**1333. Coil earthing is employed for the earthing of the \_\_\_\_\_.**

- A. distribution substation
- B. Intermediate substation
- C. Transmission line
- D. distribution poles

**Ans.: D**

**1334. 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**

**1335. 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**

**1336. 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**

**1337. 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**

**1338. As the distance from the electrode increase, the earth resistance \_\_\_\_**

- A. increases
- B. decrease
- C. cannot change
- D. none of the above

**Ans.: B**

**1339. 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**

**1340. 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**

**1341. 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**

**1342. 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**

**1343. 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**

**1344. 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**

**1345. 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**



**1346. Earth tester is an instrument to measure \_\_\_\_.**

- A. high resistance
- B. low resistance
- C. medium resistance
- D. extra high resistance

**Ans.: B**

**1347. \_\_\_\_ 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**

**1348. 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**

**1349. 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**

**1350. \_\_\_\_ 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**

**1351. 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**

**1352. Earth wire of the overhead line should be earthed at every \_\_\_\_ distance by preparing independent earth pit.**

- A. 10 km
- B. 5.5 km
- C. 6.5 km
- D. 15 km

**Ans.: C**

**1353. 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**

**1354. 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**

**1355. Solid earthing system is employed up to \_\_\_\_.**

- A. 11 kV
- B. 33 kV
- C. 66 kV
- D. 132 kV

**Ans.: B**

**1356. 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**

**1357. 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**

**1358. 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**

**1359. 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**

**1360. 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**

**1361. 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**

**1362. Neutral is not available when system is \_\_\_\_.**

- A. star connected
- B. delta connected
- C. star-delta
- D. none of the above

**Ans.: B**

**1363. IF we double the radius of an electrode, the resistance would decreases only by \_\_\_\_.**

- A. 20 %
- B. 30 %
- C. 10 %
- D. 25 %

**Ans.: C**

**1364. 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**

**1365. soil resistivity is expressed in \_\_\_\_.**

- A. Ohm-meter
- B. Ohm/ meter
- C. Ohm
- D. meter/ohm

**Ans.: A**

**1366. 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**

**1367. 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**

**1368. 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**

**1369. 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**

**1370. 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.  $\rho = 2\pi AR$

[ $\rho$  = average soil resistivity in ohm-cm, A= distance between the electrode, R= the measured resistance value in ohm]

**Ans.: D**

**1371. \_\_\_\_\_ 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**

**1372. 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**

**1373. 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**

**1374. 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]

**1375. The melting point of aluminium is \_\_\_\_ than copper.**

- A. higher
- B. less
- C. equal
- D. none of the above

**Ans.: B**

**1376. 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**

**1377. \_\_\_\_ 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**

**1378. 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**

**1379. 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**

**1380. 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**

**1381. 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**

**1382. 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**

**1383. The impulse impedance is always \_\_\_\_\_ than its power frequency impedance.**

- A. lower
- B. higher
- C. equal
- D. any of the above

**Ans.: B**

**1384. 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**

**1385. Pure water is poor conductor of \_\_\_\_\_.**

- A. temperature
- B. sound
- C. electricity
- D. all of the above

**Ans.: C**

**1386. 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**

**1387. Current flows from earthing grid during \_\_\_\_ creating potential difference.**

- A. operation and working
- B. faults
- C. lighting
- D. all of the above

**Ans.: D**

**1388. 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**

**1389. Tower footing resistance should be below \_\_\_\_.**

- A. 10  $\Omega$
- B. 50  $\Omega$
- C. 40  $\Omega$
- D. 20  $\Omega$

**Ans.: A**

**1390. Material used for tower footing can be \_\_\_\_.**

- A. iron clad
- B. copper plates
- C. Both A and B
- D. tungsten

**Ans.: C**

**1391. \_\_\_\_ 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**

**1392. A human body can tolerate a current slightly higher than \_\_\_\_.**

- A. 10 Hz
- B. 5 Hz
- C. 15 Hz
- D. 25 Hz

**Ans.: D**



**1393. 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**

**1394. 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**

#### **IV. MEASUREMENTS AND MEASURING INSTRUMENTS**

**1395.** 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)**

**1396.** 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 $\Omega$ /Volt, Voltmeter C: 10mA, 15 k $\Omega$ . 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)**

**1397.** If the DC voltmeter is made from an ammeter having a full-scale deflection of 100  $\mu$ A, then its sensitivity in (k $\Omega$  /V) will be

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

**Ans: (b)**

**1398.** 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)**

**1399.** Loading effect is primarily caused by instruments having

- (a) High resistance
- (b) High sensitivity
- (c) Low sensitivity
- (d) High range

**Ans: (c)**

**1400.** 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)**

**1401.** The energy capacity of a storage battery is rated in

- (a) kWh
- (b) kW
- (c) Ampere hours
- (d) Joules

**Ans: (c)**

**1402.** Torque/weight ratio of an instrument indicates

- (a) Selectivity
- (b) Accuracy
- (c) Fidelity
- (d) Sensitivity

**Ans: (d)**

**1403.** 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**

**1404.** 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)  $0.006\Omega$
- (b)  $0.30\Omega$
- (c)  $30\Omega$
- (d)  $6\Omega$

**Ans: (a)**

**1405.** 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)**

**1406.** 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)**

**1407.** Perfect reproducibility means the instrument has

- (a) Zero drift
- (b) High accuracy
- (c) Maximum drift
- (d) Minimum accuracy

**Ans: (a)**

**1408.** 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)**

**1409.** works on the chemical effect of current.

- (a) Power factor meter
- (b) Voltmeter
- (c) DC ampere hour meter
- (d) Wattmeter

**Ans: (c)**

**1410.** 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)**

**1411.** 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)**

**1412.** 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)**

**1413.** 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)**

**1414.** Electric field is defined as the electric force per unit

- (a) Length
- (b) Charge
- (c) Flux
- (d) Momentum

**Ans: (b)**

**1415.** 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)**

**1416.** 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)**

**1417.** Error detector is also called as

- (a) Multiplexer
- (b) Decoder
- (c) Comparator
- (d) Integrator

**Ans: (c)**

**1418.** The ratio of output change for a given measuring system is referred to as

- (a) Sensitivity
- (b) Linearity
- (c) Stability
- (d) Fidelity

**Ans: (a)**

**1419.** 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)**

**1420.** 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)**

**1421.** 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)**

**1422.** In a measurement systems, which of the following static characteristic are desirable.

- (a) Accuracy
- (b) Sensitivity
- (c) Reproducibility
- (d) All of these

**Ans: (d)**

**1423.** 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)**

**1424.** 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)**

**1425.** 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)**

**1426.** For accuracy of the instrument which is necessary-

- (a) Conformity
- (b) Precision
- (c) Both (a) and (b)
- (d) None of these

**Ans: (c)**

**1427.** 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)**

**1428.** 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)**

**1429.** 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)**

**1430.** The pointer of an indicating instrument should be:

- (a) very light
- (b) very weighty
- (c) light
- (d) weighty

**Ans: (a)**

**1431.** 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)**

**1432.** 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)**

**1433.** 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)**

**1434.** In an Induction type meter, maximum torque is produced when the phase angle between two fluxes is-

- (a)  $0^\circ$
- (c)  $60^\circ$
- (b)  $45^\circ$
- (d)  $90^\circ$

**Ans: (d)**

**1435.** 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)**

**1436.** 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)**

**1437.** Indicating instruments should be

- (a) undamped
- (b) critically damped
- (c) over damped
- (d) under damped

**Ans: (d)**

**1438.** Determine the absolute error of measurement if measured value of a resistance =  $20.65\Omega$  and true value =  $20.55\Omega$ .

- (a)  $0.1\Omega$
- (b)  $0.2\Omega$
- (c)  $0.3\Omega$
- (d)  $0.4\Omega$

**Ans: (a)**

**1439.** Which torque is essential for indicating instruments

- (a) Deflecting
- (b) Controlling
- (c) Damping
- (d) All of these

**Ans: (d)**

**1440.** Damping torque is essential to

- (a) Increase oscillation
- (b) Reduce oscillation
- (c) Maintain oscillation unchanged
- (d) None of these

**Ans: (b)**

**1441.** 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)**

**1442.** 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)**

**1443.** In case of over damping the instrument will become

- (a) Oscillating
- (b) Dead
- (c) Fast and sensitive
- (d) Slow and lethargic

**Ans: (d)**

**1444.** 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)**

**1445.** 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)**

**1446.** 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)**



**1447.** The most basic of all instrument is

- (a) The current meter
- (b) The voltmeter
- (c) The multimeter
- (d) The oscilloscope

**Ans: (b)**

**1448.** A voltage using a 20  $\mu\text{A}$  meter movement has a sensitivity of

- (a) 20  $\mu \Omega / \text{V}$
- (b) 1000  $\Omega / \text{V}$
- (c) 20,000  $\Omega / \text{V}$
- (d) 50,000  $\Omega / \text{V}$

**Ans: (d)**

**1449.** A voltmeter uses a meter with  $I_{fs}=2 \text{ mA}$ . Its sensitivity is

- (a) 500  $\Omega / \text{V}$
- (b) 500  $\text{V} / \Omega$
- (c) 200  $\Omega / \text{V}$
- (d) 2000  $\text{V} / \Omega$

**Ans: (a)**

**1450.** 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**

**1451.** The span of a zero centered voltmeter having a scale from -15 V to +15 V is:

- (a) -30 V
- (c) 0 V
- (b) 30 V
- (d) 15 V

**Ans: (b)**

**1452.** 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)**

**1453.** 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)**

**1454.** 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)**

**1455.** Which of the following cannot be measured by multimeters?

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

**Ans: (a)**

**1456.** Zero adjustment becomes necessary in analog multimeter before measuring:

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

**Ans: (b)**

**1457.** 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)**

**1458.** What is a Weston frequency meter?

- (a) Moving coil instrument
- (b) Moving iron instrument
- (c) Dynamometer type instrument
- (d) Induction instrument

**Ans: (b)**

**1459.** 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)**

**1460.** What principle makes the instrument transformer working?

- (a) Selfinduction
- (b) Lenz law
- (c) Mutual induction
- (d) Fleming's right hand rule

**Ans: c**

**1461.** Which instrument is the cheapest disregarding the accuracy?

- (a) PMMC
- (b) Moving iron
- (c) Rectifier
- (d) Electrodynamometer

**Ans: (b)**

**1462.** 1 mA ammeter has a resistance of  $100\Omega$ . 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)**

**1463.** Electrostatic instruments are used as only

- (a) Ammeters
- (b) Voltmeters
- (c) Watt meters
- (d) Energy meters

**Ans: (b)**

**1464.** A 50V range voltmeter has a sensitivity of  $20k\ \Omega/V$ . The total resistance of the voltmeter is

- (a)  $2.5\ k\Omega$
- (b)  $0.4\ k\Omega$
- (c)  $10\ k\Omega$
- (d)  $1\ M\Omega$

**Ans: (d)**

**1465.** 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)**

**1466.** 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)**

**1467.** Which of the following instruments is exclusively used for measuring radio frequency currents?

- (a) Moving iron
- (b) Thermocouple
- (c) PMMC
- (d) Electrodynamic

**Ans: (b)**

**1468.** 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)**

**1469.** 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)**

**1470.** 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)**

**1471.** 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  $60^\circ$
- (d) Inclined at  $30^\circ$

**Ans: (b)**

**1472.** Identify the instrument which has no controlling torque

- (a) Electrostatic voltmeter
- (b) Power factor meter
- (c) Watt meter
- (d) Dynamometer type ammeter

**Ans: (b)**

**1473.** 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)**

**1474.** Pick the odd instrument out

- (a) Moving iron meter
- (b) Moving coil meter
- (c) Dynamometer wattmeter
- (d) Watt-hour meter

**Ans: (d)**

**1475.** A meter has a full scale deflection of  $90^\circ$  at a current of  $I_A$ . The response of the meter is square law. Assuming spring control, the current for a deflection at  $45^\circ$  will be

- (a) 0.25
- (b) 0.50
- (c) 0.707
- (d) 0.67

**Ans: (c)**

**1476.** 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)**

**1477.** PMMC type instrument normally use

- (a) No damping is required
- (b) Fluid-friction damping
- (c) Eddy current damping
- (d) Air-friction damping

**Ans: (c)**

**1478.** 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 burn out

**Ans: (a)**

**1479.** Moving iron instruments can be used on

- (a) High frequency supply
- (b) DC only
- (c) Measure AC and DC
- (d) AC only

**Ans: (c)**

**1480.** 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

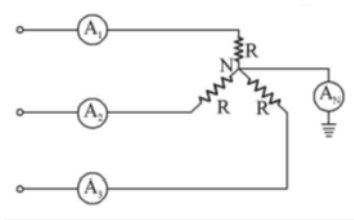
**Ans: (a)**

**1481.** 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)**

- 1482.** In the circuit shown in the given figure, three phase supply is connected to a star connected load. If ammeters A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub> read 12.5 A, what will be the reading of ammeter A<sub>N</sub>



- (a) 37.5 A
- (b)  $1/\sqrt{3}$  A
- (c)  $37.5\sqrt{3}$  A
- (d) Zero

**Ans: (d)**

- 1483.** An integrating digital voltmeter measures

- (a) True average value
- (b) RMS value
- (c) Peak value
- (d) Peak to peak value

**Ans: (a)**

- 1484.** 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)**

- 1485.** 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)**

- 1486.** A 35 V DC supply is connected across a combined resistance of  $600\Omega$  and an unknown resistance of  $R\Omega$  in series. If a voltmeter having a resistance of  $1.2k\Omega$  is connected across  $600\Omega$  resistor and reads 5V, then what is the value of the resistance R

- (a)  $120\Omega$
- (b)  $500\Omega$
- (c)  $1.7\Omega$
- (d)  $2.4k\Omega$

**Ans: (d)**

**1487.** 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 can be measured?

- (a) 10  $\Omega$
- (b) 20  $\Omega$
- (c) 40  $\Omega$
- (d) 80  $\Omega$

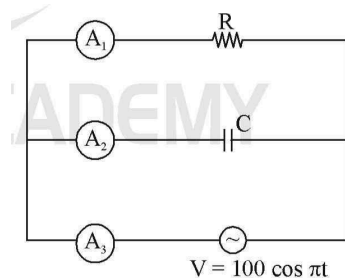
**Ans: (d)**

**1488.** 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)**

**1489.** In the figure shown below A<sub>1</sub>, A<sub>2</sub> and A<sub>3</sub> are ideal ammeters. If A<sub>2</sub> and A<sub>3</sub> read 4A and 5A respectively, what is the reading of A<sub>1</sub>?



- (a) 1 A
- (b) 3 A
- (c) 9 A
- (d) Cannot be calculated without the values of R and C

**Ans: (b)**

**1490.** If two 300V full-scale voltmeters V<sub>1</sub> and V<sub>2</sub> having sensitivity of 100k $\Omega$ /V and 150k $\Omega$ /V respectively are connected in series to measure 500 V, then

- (a) V<sub>1</sub> and V<sub>2</sub> will read 250 V each
- (b) V<sub>1</sub> will read 200 V and V<sub>2</sub> will read 300 V
- (c) V<sub>1</sub> will read 300 V and V<sub>2</sub> will read 200 V
- (d) V<sub>1</sub> and V<sub>2</sub> will read 0V each

**Ans: (b)**

**1491.** 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)**

**1492.** Which one of the following variable cannot be measured directly by a CRO?

- (a) Current
- (b) Voltage
- (c) Phase difference
- (d) Frequency

**Ans: (a)**

**1493.** 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)**

**1494.** 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)**

**1495.** A moving iron instrument has  $10\Omega$  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)  $14990\Omega$  in series
- (d)  $14990\Omega$  in parallel

**Ans: (c)**

**1496.** 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)**

**1497.** 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)**



**1498.** A 0.1A ammeter having a resistance of  $10\Omega$  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)  $1.2\Omega$

**Ans: (c)**

**1499.** For a given frequency, the deflecting torque of an induction ammeter is directly proportional to

- (a)  $\text{Current}^2$
- (b)  $\text{Current}^3$
- (c)  $\sqrt{\text{current}}$
- (d)  $\text{Current}$

**Ans: (a)**

**1500.** 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)**

**1501.** The damping torque in a measuring instrument can be produced by

- (a) Eddy current
- (b) Gravity control
- (c) Electro statically
- (d) Thermally

**Ans: (a)**

**1502.** 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)**

**1503.** No eddy current and hysteresis losses occur in

- (a) Electrostatic instruments
- (b) PMMC type instruments
- (c) Moving-iron instruments
- (d) Electrodynamometer instruments

**Ans: (a)**

- 1504.** 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)**

- 1505.** In a gravity controlled instrument, controlling torque is proportional to
- (a)  $\Theta$
  - (b)  $\Theta^2$
  - (c)  $\sin\Theta$
  - (d) None of these

**Ans: (c)**

- 1506.** Electrostatic instruments are normally used for
- (a) Low current measurements
  - (b) High current measurements
  - (c) Low voltage measurements
  - (d) High voltage measurements

**Ans: (d)**

- 1507.** 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)**

- 1508.** 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)**

- 1509.** 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)**

- 1510.** 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)**

- 1511.** 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)**

- 1512.** 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)**

- 1513.** 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)**

- 1514.** A Galvanometer has
- (a) Air friction damping
  - (b) Fluid friction damping
  - (c) Eddy current damping
  - (d) Electromagnetic damping

**Ans: (d)**

- 1515.** 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) Decease
  - (b) Increase and decrease respectively
  - (c) Decrease and increase respectively
  - (d) Increase

**Ans: (b)**

**1516.** Which meter has the highest accuracy?

- (a) PMMC
- (b) Moving iron
- (c) Electrodynamometer
- (d) Rectifier

**Ans: (a)**

**1517.** 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)**

**1518.** 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)**

**1519.** 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)**

**1520.** 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)**

**1521.** 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  $\Omega$ /series)
- (b) (0.05  $\Omega$ /parallel)
- (c) (0.20  $\Omega$ /parallel)
- (d) (0.20  $\Omega$ /series)

**Ans: (b)**

**1522.** 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)**

**1523.** 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)**

**1524.** 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)**

**1525.** 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)**

**1526.** Which of the following can be measured by a multimeter?

- (a) Voltage
- (b) Resistance
- (c) Current
- (b) Resistance
- (d) All the above

**Ans: (d)**

**1527.** An instrument which detects electric current is known as

- (a) Voltmeter
- (c) Wattmeter
- (b) Rheostat
- (d) Galvanometer

**Ans: (d)**

**1528.** 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)**

**1529.** 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)**

**1530.** 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)**

**1531.** A Q-meter measures:

- (a) Loss in a capacitor
- (b) Frequency
- (c) Accurate value of electrical quantity
- (d) Properties of the coils

**Ans: (d)**

**1532.** 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

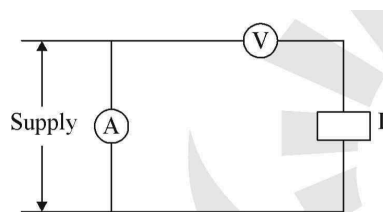
**Ans: (c)**

**1533.** The deflection torque can be produced by:

- (a) Gravity control
- (b) Spring control
- (c) Air friction
- (d) Magnetically

**Ans: (d)**

**1534.** 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)**

**1535.** 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)**

**1536.** 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)**

**1537.** 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)**

**1538.** 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)**

**1539.** 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)**

**1540.** 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)**

**1541.** 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  $\Omega$
- (b) 4998  $\Omega$
- (c) 498  $\Omega$
- (d) 49.8  $\Omega$

**Ans: (b)**

**1542.** 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)**

**1543.** Internal resistance of a micro-ammeter is 500 ohm. Shunt resistance required to increase its range from 0-100  $\mu$ A to 0-10 A will be approximately

- (a) 0.05  $\Omega$
- (b) 0.005  $\Omega$
- (c) 0.5  $\Omega$
- (d) 5.0  $\Omega$

**Ans: (b)**

**1544.** 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)**

**1545.** Megger is used to measure

- (a) Very high resistance or insulation resistance
- (b) Low resistance
- (c) High resistance
- (d) Very low resistance

**Ans: (a)**

**1546.** 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)**

**1547.** The sensitivity of a voltmeter using 0-5 mA meter movement is

- (a) 200  $\Omega$ /V
- (b) 150  $\Omega$ /V
- (c) 100  $\Omega$ /V
- (d) 50  $\Omega$ /V



**Ans: (a)**

**1548.** 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)**

**1549.** 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)**

**1550.** Ballistic galvanometer is calibrated to measure:

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

**Ans: (d)**

**1551.** Voltmeter has

- (a) Low resistance
- (b) High resistance
- (c) Infinite resistance
- (d) Zero resistance

**Ans: (b)**

**1552.** 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)**

**1553.** Scale of Moving Iron instruments is:

- (a) Linear
- (b) Non-uniform
- (c) Exponential
- (d) Logarithmic

**Ans: (b)**

**1554.** 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)**

**1555.** Which of the following is an Integrating instrument?

- (a) Watt-hour meter
- (b) Ammeter
- (c) Voltmeter
- (d) Wattmeter

**Ans: (a)**

**1556.** 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)**

**1557.** 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)**

**1558.** An ammeter has a current range of 0-5A and its internal resistance is  $0.4\Omega$ . In order to change the range to 0-50 A, we need to add a resistance of

- (a)  $0.4\Omega$  in series with the meter
- (b)  $1.0\Omega$  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)**

**1559.** 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)**

**1560.** 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)**

**1561.** 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)**

**1562.** With a multiplier setting of 30 k $\Omega$ , it reads 400V and with a multiplier setting of 80 k $\Omega$ , it reads 250 V For a multiplier setting of 20 k $\Omega$ , the voltmeter reads

- (a) 371 V
- (b) 483 V
- (c) 437.5 V
- (d) 455 V

**Ans: (d)**

**1563.** 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)**

**1564.** A current of  $10 + 6 \sin(\omega t + 30^\circ)$  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)**

**1565.** 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)**

**1566.** Which part/phenomenon controls the controlling torque in megger?

- (a) Earthing
- (c) Spring
- (b) Leakage current
- (d) Coil

**Ans: (d)**

**1567.** 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)**

**1568.** 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)**

**1569.** Alternating current is measured by

- (a) Induction ammeter
- (b) Electrostatic ammeter
- (c) Moving iron repulsion type voltmeter
- (d) Permanent magnet ammeter

**Ans: (a)**

**1570.** In a 3-phase dynamometer type power factor meter, two moving coil planes are inclined at an angle of

- (a)  $180^\circ$
- (b)  $120^\circ$
- (c)  $90^\circ$
- (d)  $45^\circ$

**Ans: (b)**

**1571.** The insulation resistance test is carried out by the instrument

- (a) Ammeter
- (b) Voltmeter
- (c) Megger
- (d) Energymeter

**Ans: (c)**

**1572.** 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)**

**1573.** 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)**

**1574.** 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)**

**1575.** Rectifier type instrument can be use in

- (a) AC
- (b) DC
- (c) Both (a) and (b)
- (d) Pulsating

**Ans: (a)**

**1576.** 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)**

**1577.** 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)**

**1578.** 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)**

**1579.** 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**

**1580.** 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)**

**1581.** 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)**

**1582.** A meter having a sensitivity of 2 k $\Omega$ /V is used for the measurement of voltage across a circuit having an output resistance of 1 k $\Omega$  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)**

**1583.** 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)**

**1584.** A PT is a device which is :

- (a) Electrostatically coupled
- (b) Electrically coupled
- (c) Electromagnetically coupled
- (d) Conductively coupled

**Ans: (c)**

**1585.** 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)**

**1586.** A PMMC meter can be used as an ammeter using:

- (a) Series resistors
- (b) Shunt inductors
- (c) Shunt resistors
- (d) Series inductors

**Ans: (c)**

**1587.** 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)**

**1588.** 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)**

**1589.** 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)**

**1590.** In the below given deflecting torque equation ' $T_d = B \cdot I \cdot N \cdot A$ ' 'B' indicates

- (a) Constant
- (b) Flux Density
- (c) Current flowing throughout the meter
- (d) Number of turns in the coil

**Ans: (b)**

**1591.** 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)**

**1592.** 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)**

**1593.** Two 100 V full scale PMMC type DC voltmeter having Figure of Merits (FOM) of  $10 \text{ k}\Omega/\text{V}$  and  $20\text{k}\Omega/\text{V}$  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)**

**1594.** A linear scale used in

- (a) Thermocouple meters
- (b) Moving iron meters
- (c) Hotwire meters
- (d) None of these

**Ans: (d)**

**1595.** PMMC (D' Arsonval) is used for

- (a) AC current
- (b) DC voltage
- (c) AC voltage
- (d) All of the above

**Ans: (b)**

**1596.** Which meter has the highest accuracy in the prescribed limit of frequency range

- (a) Rectifier
- (b) Electrodynamometer
- (c) PMMC
- (d) Moving iron

**Ans: (b)**

**1597.** 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)**

**1598.** 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)**



**1599.** 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)**

**1600.** What is a Weston frequency meter?

- (a) Moving coil instrument
- (b) Moving iron instrument
- (c) Dynamometer type instrument
- (d) Induction instrument

**Ans: (b)**

**1601.** 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)**

**1602.** 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)**

**1603.** Which of the following statements is not an advantage of Electrodynamic instruments?

- (a) Free from hysteresis errors
- (b) Low power consumption
- (c) Low accuracy
- (d) Low sensitivity

**Ans: (d)**

**1604.** 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)**

**1605.** 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)**

**1606.** 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)**

**1607.** Identify the instrument which has no controlling torque

- (a) Electrostatic Voltmeter
- (b) Power factor meter
- (c) Watt meter
- (d) Dynamometer type Ammeter

**Ans: (b)**

**1608.** PMMC meter is fitted in

- (a) Ammeter
- (b) Voltmeter
- (c) Multimeter
- (d) Wattmeter

**Ans: (c)**

**1609.** 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)**

**1610.** 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)**

**1611.** 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)**

**1612.** In a portable instrument, the controlling torque is provided by :

- (a) Spring
- (b) Gravity
- (c) Eddy currents
- (d) Damping friction

**Ans: (a)**

**1613.** 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)**

**1614.** 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)**

**1615.** 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)**

**1616.** 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)  $0.6\Omega$
- (b)  $5\Omega$
- (c)  $6\Omega$
- (d)  $10\Omega$

**Ans: (a)**

**1617.** 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)**

**1618.** 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)**

**1619.** A 1 mA D' Arsonval movement has resistance of  $100\Omega$ . It is to be converted to a 10 V voltmeter. The value of multiplier resistance is

- (a)  $999\Omega$
- (b)  $9999\Omega$
- (c)  $9900\Omega$
- (d)  $990\Omega$

**Ans: (c)**

**1620.** A meter movement with current sensitivity  $100\mu\text{A}$  and internal resistance  $100\Omega$  is required to measure current of 10 mA. What will the shunt resistance be equal to?

- (a)  $1\Omega$
- (b)  $0.98\Omega$
- (c)  $0.99\Omega$
- (d)  $1.010101\Omega$

**Ans: (d)**

**1621.** 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)  $30^\circ$
- (b)  $45^\circ$
- (c)  $60^\circ$
- (d)  $90^\circ$

**Ans: (a)**

**1622.** 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)**

**1623.** 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)**

**1624.** 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)**

**1625.** For a  $1000\ \mu\text{A}$  movement with  $100\ \Omega$   $R_m$ , in voltage  $V_m$  at Full scale deflection is

- (a)  $250\ \mu\text{V}$
- (b)  $0.1\ \text{V}$
- (c)  $0.2\ \text{V}$
- (d)  $0.5\ \text{V}$

**Ans: (b)**

**1626.** Voltmeter sensitivity is defined by:

- (a)  $\text{V}/\Omega$
- (b)  $\text{V}/\Omega^2$
- (c)  $\Omega/\text{V}$
- (d)  $\Omega/\text{V}^2$

**Ans: (c)**

**1627.** 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)**

**1628.** Ammeters are always connected in \_\_

- (a) Series
- (b) Parallel
- (c) Either (a) or (b)
- (d) None of these

**Ans: (a)**

**1629.** An accurate voltmeter must have an internal impedance of

- (a) very low value
- (b) low value
- (c) very high value
- (d) zero

**Ans: (c)**

**1630.** 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)**

**1631.** 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)**

**1632.** Two ammeters A and B both 0-10 A have internal resistance of  $1\Omega$  and  $0.5\Omega$  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)**

**1633.** 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)**

**1634.** A 0-15 V voltmeter has a resistance of  $1000\Omega$ , if it is desired to expand its range to 0-150 V a resistance of \_\_\_\_\_ is connected in series with it.

- (a) 3  $k\Omega$
- (b) 5  $k\Omega$
- (c) 9  $k\Omega$
- (d) 2  $k\Omega$

**Ans: (c)**

**1635.** 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)  $200\Omega$
- (b)  $4000\Omega$
- (c)  $2000\Omega$
- (d)  $20,000\Omega$

**Ans: (c)**

**1636.** 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)**

**1637.** Internal resistance of an ideal ammeter is-

- (a) Zero
- (b) Infinite
- (c) Small
- (d) Big

**Ans: (a)**

**1638.** 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)**

**1639.** 184. A 10 mA ammeter has a resistance of 50 ohms. It is to be converted to a 1 A ammeter. The value of shunt resistance should be :

- (a)  $5\Omega$
- (b)  $0.1\Omega$
- (c)  $0.505\Omega$
- (d)  $0.05\Omega$

**Ans: (c)**

**1640.** Which one of the following is used to measure direct current?

- (a) Voltmeter
- (b) Ammeter
- (c) Pyrometer
- (d) Coupler

**Ans: (b)**

**1641.** 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  $100\Omega$  resistance in series with G
- (b) Add  $1000\Omega$  resistance in series with G
- (c) Add  $1\Omega$  resistance in parallel with G
- (d) Add  $0.1\Omega$  resistance in parallel with G

**Ans: (b)**

**1642.** 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)**

**1643.** 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)**

**1644.** 190. 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) 0.006 $\Omega$
- (b) 0.3 $\Omega$
- (c) 30 $\Omega$
- (d) 6 $\Omega$

**Ans: (a)**

**1645.** The value of resistance in a potential divider arrangement to convert a basic d Arsonval meter movement with an internal resistance of 100 $\Omega$  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 $\Omega$ , 155.5 k $\Omega$
- (b) 144.9 k $\Omega$ , 140 k $\Omega$
- (c) 135.5 k $\Omega$ , 134 k $\Omega$
- (d) 149.9 k $\Omega$ , 150 k $\Omega$

**Ans: (d)**

**1646.** The operating magnetic field in an electrodynamic meter type of instrument has a flux density typically about

- (a) 1 Wb/m<sup>2</sup>
- (b) 0.5 Wb/m<sup>2</sup>
- (c) 0.05 Wb/m<sup>2</sup>
- (d) 0.005 Wb/m<sup>2</sup>

**Ans: (d)**

**1647.** 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)**

**1648.** Laboratory wattmeters are:

- (a) Induction type
- (b) Moving type
- (c) Electrostatic type
- (d) Electrodynamic meter type

**Ans: (d)**

**1649.** 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**



**1650.** 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)**

**1651.** 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)**

**1652.** 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)**

**1653.** 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)**

**1654.** 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)**

**1655.** 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**

**1656.** The minimum number of wattmeters required to measure 3-phase power is

- (a) 0
- (b) 2
- (c) 4
- (d) 3

**Ans: (b)**

**1657.** 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)**

**1658.** Creep occurs in  $1\Phi$  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)**

**1659.** 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)**

**1660.** 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)**

**1661.** 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)  $0^\circ$
- (b)  $30^\circ$
- (c)  $60^\circ$
- (d)  $90^\circ$

**Ans: (c)**

- 1662.** 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)**

- 1663.** 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)**

- 1664.** 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)**

- 1665.** 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)**

- 1666.** 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)**

- 1667.** 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)**

- 1668.** The phenomena of 'creeping' occurs in

- (a) Ammeters
- (b) Voltmeters
- (c) Wattmeters
- (d) Watt-hour meters

**Ans: (d)**

- 1669.** 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)**

- 1670.** 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)**

- 1671.** 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)**

- 1672.** 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)**

- 1673.** 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)**

**1674.** The creeping is observed in

- (a) Arnmeter
- (b) Wattmeter
- (c) Energy meter
- (d) Volt meter

**Ans: (c)**

**1675.** The pressure coil of an induction type energy meter is

- (a) Highly resistive
- (b) Highly inductive
- (c) Purely resistive
- (d) Purely inductive

**Ans: (b)**

**1676.** 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)**

**1677.** 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)**

**1678.** 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)**

**1679.** 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**

**1680.** 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)**

- 1681.** 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)**

- 1682.** 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)**

- 1683.** 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)**

- 1684.** 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)**

- 1685.** 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)**

- 1686.** 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)**

**1687.** 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)**

**1688.** 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)**

**1689.** 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  $0.03\Omega$  resistance and a pressure coil of  $6000\Omega$  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)**

**1690.** 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)**

**1691.** 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)**

**1692.** Induction type energy meter measures energy in

- (a) Joules
- (b) Kw
- (c) kWh
- (d) kW<sub>s</sub>

**Ans: (c)**

**1693.** 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)**

**1694.** 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)**

**1695.** 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)**

**1696.** 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)**

**1697.** 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  $60^\circ$  to  $90^\circ$
- (d) The load is purely inductive

**Ans: (d)**

**1698.** 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)**



**1699.** 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)**

**1700.** The disc of domestic supply energy meter is made of which material ?

- (a) Zinc
- (b) Copper
- (c) Aluminium
- (d) Silver

**Ans: (c)**

**1701.** 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)**

**1702.** 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)**

**1703.** 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)**

**1704.** 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)**

**1705.** 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)**

**1706.** An electrodynamicometer type of instruments finds its major use as

- (a) Standard instrument only
- (b) Transfer instrument only
- (c) Both as or standard and transfer instruments
- (d) An indicator type of instrument

**Ans: (c)**

**1707.** Dynamometer type of instrument can use in:

- (a) AC
- (b) DC
- (c) AC and DC
- (d) Pulsating

**Ans: (c)**

**1708.** 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)**

**1709.** 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)**

**1710.** Watt-hour instrument is the type of

- (a) Indicating
- (b) Integrating
- (c) Recording
- (d) None of the above

**Ans: (b)**

**1711.** Induction type instrument are used in

- (a) AC
- (b) DC
- (c) Both
- (d) None of the above

**Ans: (a)**

**1712.** The correct statement about Electrodynamicometer 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)**

**1713.** A Dynamo works on the principle of \_\_\_\_\_

- (a) Supercharging
- (b) Electromagnetic induction
- (c) Alternating current
- (d) Kirchoff's Law

**Ans: (b)**

**1714.** A volt meter has resistance of  $2000\Omega$ , when it is connected across a d.c. circuit its power consumption is 2 mW. Suppose this voltmeter is replaced by a voltmeter of  $4000\Omega$  resistance the power consumption will be

- (a) 4 mW
- (b) 1 mW
- (c) 2 mW
- (d) none of these

**Ans: (b)**

**1715.** The Energy provided by Ideal voltage source when the load is open circuit

- (a) Zero
- (b) Infinite
- (c) Unity
- (d) Not specific

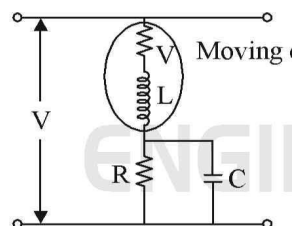
**Ans: (a)**

**1716.** 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)**

**1717.** 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)**

**1718.** 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**

**1719.** In the two wattmeter method of measuring 3 phase power, the wattmeter indicated equal and opposite readings when load power factor is-

- (a)  $90^\circ$  leading
- (b)  $90^\circ$  lagging
- (c)  $30^\circ$  leading
- (d)  $30^\circ$  lagging

**Ans: (b)**

**1720.** 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)**

**1721.** 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)**

**1722.** The pressure coil of a dynamometer type wattmeter is

- (a) Highly inductive
- (b) Highly resistive
- (c) Purely resistive
- (d) Purely inductive

**Ans: (b)**

**1723.** 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)**

**1724.** 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)**

**1725.** 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)**

**1726.** 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)**

**1727.** 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)**

**1728.** 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)**

**1729.** 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)**

**1730.** 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**

**1731.** How many coils are there in a wattmeter?

- (a) 2
- (b) 3
- (c) 4
- (d) 1

**Ans: (a)**

**1732.** 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)**

**1733.** 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)**

**1734.** 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)**

**1735.** 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)**

**1736.** 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)**

- 1737.** 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)**

- 1738.** 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)**

- 1739.** 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)**

- 1740.** 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)**

- 1741.** Time base generators used in CRO produces waveforms

- (a) Sine
- (b) Square
- (c) Sweep
- (d) Pulse

**Ans: (c)**

- 1742.** CRO probe assembly is an application of

- (a) Multi vibrator
- (b) Attenuator
- (c) Clipper
- (d) Clamper

**Ans: (b)**

- 1743.** 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)  $270^\circ$
- (b)  $210^\circ$

- (c)  $180^\circ$
- (d)  $300^\circ$

**Ans: (b)**

**1744.** Q-meter works on the principal of

- (a) Series resonance
- (b) Parallel resonance
- (c) Mutual inductance
- (d) Self inductance

**Ans: (a)**

**1745.** 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)**

**1746.** 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)**

**1747.** 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)**

**1748.** 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)**

**1749.** 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)**

**1750.** 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**

**1751.** 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)**

**1752.** 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)**

**1753.** 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)**

**1754.** 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)**

**1755.** 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)**

**1756.** 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)**

**1757.** 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)**

**1758.** 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)**

**1759.** The input impedance of CRO is nearly

- (a) Zero
- (b) Around 10 ohms
- (c) Around 100 ohms
- (d) Around one mega ohm

**Ans: (d)**

**1760.** 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)**

**1761.** LVDT is a:

- (a) Displacement transducer
- (b) Velocity transducer
- (c) Acceleration transducer
- (d) Pressure transducer

**Ans: (a)**

**1762.** 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)**

**1763.** Transducers may not to be called as:

- (a) Gauges
- (b) Pickups
- (c) Signal generators
- (d) Amplifiers

**Ans: (d)**

**1764.** LVDT can not measure:

- (a) Weight
- (b) Pressure
- (c) Acceleration
- (d) Temperature

**Ans: (d)**

**1765.** Which gauge is used to measure the thickness of sheet?

- (a) Wire gauge
- (b) Sheet gauge
- (c) Feeler gauge
- (d) Pitch gauge

**Ans: (b)**

**1766.** The stroboscope is used to measure?

- (a) Displacement speed
- (b) Pressure
- (c) Speed
- (d) Temperature

**Ans: (c)**

**1767.** Load cell essentially is a

- (a) Thermistor
- (b) Strain gauge
- (c) Photo voltaic cell
- (d) Photo diode

**Ans: (b)**

**1768.** Solar beam radiation is measured using

- (a) Anemometer
- (b) Thermometer
- (c) Sunshine
- (d) Pyrheliometerrecorder

**Ans: (d)**

**1769.** 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)**

**1770.** 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)**

**1771.** The operation of a Thermocouple is based on:

- (a) Thomson effect
- (b) Seebeck effect
- (c) Peltier effect
- (d) Faraday's laws

**Ans: (b)**

**1772.** The output of a thermo-couple is

- (a) DC current
- (b) DC voltage
- (c) AC current
- (d) AC voltage

**Ans: (b)**

**1773.** Which of the following instruments is exclusively used for measuring radio frequency currents?

- (a) Moving iron
- (b) Thermocouple
- (c) PMMC
- (d) Electrodynamic

**Ans: (b)**

**1774.** 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)**

**1775.** Thermistor is employed for measurement of

- (a) Linear displacement
- (b) Acceleration
- (c) Pressure
- (d) Temperature

**Ans: (d)**

**1776.** 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)**

**1777.** Which of these instruments has highest power consumption?

- (a) Dynamometer
- (b) Electrostatic
- (c) Moving coil
- (d) Hot Wire

**Ans: (d)**

**1778.** 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)**

**1779.** 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)**

**1780.** 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)**

**1781.** The calibration signal available from CRO is of the form :

- (a) Sinusoidal wave
- (b) Square wave
- (c) Sawtooth wave
- (d) DC signal

**Ans: (c)**

**1782.** 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)**

- 1783.** 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)**

- 1784.** 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)**

- 1785.** Synchro is
- (a) Probolic transducer
  - (b) An angular position transducer
  - (c) A synchronizing transducer
  - (d) A variable transducer

**Ans: (b)**

- 1786.** The transducer employed for measurement of angular displacement is
- (a) LVDT
  - (c) Thermistor
  - (b) Thermocouple
  - (d) Circular potentiometer

**Ans: (d)**

## **PART - II**

### **I. BASIC PRINCIPLES AND FUNCTIONS OF THE FOLLOWING**

#### **a) PLCs**

- 1787.** What does the acronym PLC stand for?

- A) Programmable Logic Controller
- B) Programmable Linear Controller
- C) Private Logic Controller
- D) Programmed Logic Control

Answer: A) Programmable Logic Controller

- 1788.** Which of the following is the main purpose of a PLC?

- A) To automate industrial processes
- B) To store data

C) To measure physical parameters

D) To monitor system performance

Answer: A) To automate industrial processes

**1789.** What type of devices are typically controlled by PLCs?

A) Personal computers

B) Motor drives, conveyor belts, and valves

C) Phones and televisions

D) Data centers

Answer: B) Motor drives, conveyor belts, and valves

**1790.** Which programming language is most commonly used in PLC systems?

A) Ladder Logic

B) C++

C) Python

D) Java

Answer: A) Ladder Logic

**1791.** What is the purpose of the input section in a PLC?

A) To process the data

B) To execute the control program

C) To read signals from sensors or switches

D) To control the actuators

Answer: C) To read signals from sensors or switches

**1792.** What is a PLC output used for?

A) To perform calculations

B) To communicate with a computer

C) To provide control signals to external devices (e.g., motors, valves)

D) To monitor the PLC's status

Answer: C) To provide control signals to external devices (e.g., motors, valves)

**1793.** Which of the following is a common feature of PLCs?

- A) Ability to perform basic arithmetic operations
- B) Control of digital devices only
- C) Limited input and output options
- D) Only used in small, manual systems

Answer: A) Ability to perform basic arithmetic operations

**1794.** What is the role of the CPU in a PLC system?

- A) To read input signals
- B) To execute the control program and process inputs/outputs
- C) To store historical data
- D) To provide communication with other devices

Answer: B) To execute the control program and process inputs/outputs

**1795.** Which of the following is NOT a common type of input in PLCs?

- A) Discrete inputs (digital)
- B) Analog inputs
- C) Discrete outputs
- D) Memory modules

Answer: D) Memory modules

**1796.** How does a PLC system typically receive input signals from sensors or switches?

- A) Through an external computer
- B) Via input modules that convert physical signals into digital values
- C) By using wireless communication only
- D) Through a built-in HMI

Answer: B) Via input modules that convert physical signals into digital values

**1797.** What is the function of an "output module" in a PLC?

- A) To execute logic operations
- B) To convert output signals from digital form to physical actions (e.g., motor on/off)



C) To store historical data

D) To process analog data

Answer: B) To convert output signals from digital form to physical actions (e.g., motor on/off)

**1798.** Which type of PLC input is most commonly used to measure temperature?

A) Discrete input

B) Analog input

C) Digital input

D) Serial input

Answer: B) Analog input

**1799.** Which of the following is a key advantage of using PLCs in industrial automation?

A) High cost of installation

B) Flexibility in control of complex processes

C) Limited expandability

D) Lack of programming languages

Answer: B) Flexibility in control of complex processes

**1800.** What is the most common type of output in a PLC system?

A) Analog output

B) Relay output

C) Digital output

D) Pneumatic output

Answer: C) Digital output

**1801.** What is an example of a discrete (digital) input in a PLC system?

A) Temperature sensor

B) On/Off switch

C) Pressure gauge

D) Flow meter

Answer: B) On/Off switch

**1802.** Which of the following is NOT typically a part of a PLC's hardware?

- A) CPU
- B) Power supply
- C) HMI (Human Machine Interface)
- D) Keyboard

Answer: D) Keyboard

**1803.** What does the "scan cycle" of a PLC refer to?

- A) The time taken to process a single input signal
- B) The time it takes to read inputs, execute the program, and update outputs
- C) The frequency of control outputs
- D) The rate at which the PLC can communicate with external devices

Answer: B) The time it takes to read inputs, execute the program, and update outputs

**1804.** What is the most common PLC programming language that mimics electrical relay logic?

- A) Ladder Logic
- B) Structured Text
- C) Function Block Diagram
- D) Sequential Function Chart

Answer: A) Ladder Logic

**1805.** What is an advantage of using a "modular" PLC design?

- A) Increased processing speed
- B) Simplified programming
- C) Flexibility to add or remove I/O modules as needed
- D) Reduced need for external communication

Answer: C) Flexibility to add or remove I/O modules as needed

**1806.** Which of the following is a primary use case for a PLC system?

- A) Powering electrical devices directly
- B) Automating manufacturing lines and processes
- C) Running software applications
- D) Storing database information

Answer: B) Automating manufacturing lines and processes

**1807.** Which part of the PLC is responsible for executing the user's program?

- A) Power supply
- B) CPU (Central Processing Unit)
- C) Input module
- D) Output module

Answer: B) CPU (Central Processing Unit)

**1808.** What type of signal does a discrete output module in a PLC typically send?

- A) Analog signal
- B) Digital signal (On/Off)
- C) Serial signal
- D) Temperature signal

Answer: B) Digital signal (On/Off)

**1809.** What does the term "sinking input" refer to in a PLC?

- A) A type of input that requires power to be applied to the device
- B) An input where the controller provides power to the field device
- C) An input signal that is at ground or low voltage when active
- D) An input signal that needs to be processed by the CPU

Answer: C) An input signal that is at ground or low voltage when active

**1810.** What is a "retentive" memory in a PLC?

- A) A memory that retains its value even when the power is lost
- B) A memory used for calculations
- C) A memory that resets to zero after every scan cycle
- D) A memory used for storing programs

Answer: A) A memory that retains its value even when the power is lost

**1811.** Which of the following is typically the most common type of PLC communication method?

- A) Wi-Fi
- B) Serial communication (RS-232, RS-485)
- C) Bluetooth
- D) Infrared communication

Answer: B) Serial communication (RS-232, RS-485)

**1812.** In a PLC, what does "latching" refer to?

- A) Holding a relay in an activated state even after the input signal is no longer present
- B) Changing the output state based on input changes only
- C) Storing a specific data value in a memory register
- D) Resetting all outputs to their initial states

Answer: A) Holding a relay in an activated state even after the input signal is no longer present

**1813.** What does the term "PLC ladder diagram" refer to?

- A) A graphical representation of a PLC's memory structure
- B) A programming method based on relay contacts and coils arranged in a ladder-like structure
- C) A report for debugging PLC programs
- D) A physical device for connecting PLCs to sensors

Answer: B) A programming method based on relay contacts and coils arranged in a ladder-like structure

**1814.** What is the function of a PLC "diagnostic" indicator?

- A) To store the user program
- B) To provide real-time data on the controller's performance and issues
- C) To process input data
- D) To execute the control program

Answer: B) To provide real-time data on the controller's performance and issues

**1815.** In a PLC, what type of data can be stored in a "register"?

- A) Programs only
- B) Input and output signals
- C) Process control data such as integer or floating-point values
- D) Communications configurations

Answer: C) Process control data such as integer or floating-point values

**1816.** What is the primary benefit of using PLCs in automation over traditional hard-wired control systems?

- A) Increased energy consumption
- B) Easier program modification and flexibility
- C) More complex wiring
- D) Lack of maintenance

Answer: B) Easier program modification and flexibility

**1817.** What does the term "scan time" in a PLC refer to?

- A) The time it takes to read inputs and outputs
- B) The time it takes for the PLC to execute the user's program once
- C) The time it takes to power up the PLC
- D) The time it takes to reset the PLC

Answer: B) The time it takes for the PLC to execute the user's program once

**1818.** In a PLC, what happens during the "input scan" phase?

- A) The CPU processes the program logic
- B) The PLC reads the status of all input devices
- C) The outputs are updated
- D) The communication with external devices is initialized

Answer: B) The PLC reads the status of all input devices

**1819.** Which of the following PLC components determines the behavior of the PLC system?

- A) Input module
- B) CPU
- C) Power supply
- D) Output module

Answer: B) CPU

**1820.** What type of PLC system is most commonly used in large-scale industries such as automobile manufacturing?

- A) Micro PLC
- B) Modular PLC
- C) Rack-mounted PLC
- D) Compact PLC

Answer: B) Modular PLC

**1821.** What does "I/O" stand for in a PLC system?

- A) Input/output
- B) Input-only
- C) Immediate/Output
- D) Input/Output controller

Answer: A) Input/output

**1822.** Which of the following programming languages is typically used for more complex PLC applications?

- A) Ladder Logic
- B) Function Block Diagram
- C) Structured Text
- D) Sequential Function Chart

Answer: C) Structured Text

**1823.** What is the primary function of the PLC "power supply"?

- A) To execute the user program
- B) To provide power to the CPU and I/O modules
- C) To store input signals
- D) To communicate with the external network

Answer: B) To provide power to the CPU and I/O modules

**1824.** What kind of output device can a PLC typically control?

- A) Air compressors
- B) Digital displays
- C) Relays, solenoids, and motors
- D) Sensors and pressure gauges

Answer: C) Relays, solenoids, and motors

**1825.** Which of the following is a feature of a "micro PLC"?

- A) It has many I/O modules
- B) It is typically used for small, simple applications
- C) It is only suitable for large-scale industrial operations
- D) It requires external power sources to operate

Answer: B) It is typically used for small, simple applications

**1826.** In PLC programming, what does the "coil" represent?

- A) A physical device like a motor
- B) A data structure used to store variables
- C) A binary output that can be turned ON or OFF
- D) A feedback mechanism

Answer: C) A binary output that can be turned ON or OFF

**1827.** Which of the following programming languages for PLC is most similar to high-level programming languages?

- A) Ladder Logic
- B) Structured Text
- C) Function Block Diagram
- D) Sequential Function Chart

Answer: B) Structured Text

**1828.** What is the primary difference between a "compact PLC" and a "modular PLC"?

- A) Compact PLCs have limited expansion capabilities
- B) Modular PLCs require more space
- C) Compact PLCs are only for small applications
- D) Modular PLCs do not have I/O capabilities

Answer: A) Compact PLCs have limited expansion capabilities

**1829.** In PLCs, what is the purpose of the "timer" function?

- A) To delay or create time-based events in control logic
- B) To store control programs
- C) To monitor input data
- D) To control analog signals

Answer: A) To delay or create time-based events in control logic



**1830.** What is the maximum number of I/O devices a PLC can handle based on its design?

- A) It depends on the PLC's memory and module slots
- B) Always 64 devices
- C) Always 128 devices
- D) It is fixed at 256 devices

Answer: A) It depends on the PLC's memory and module slots

**1831.** Which of the following represents a disadvantage of using PLC systems in automation?

- A) High cost
- B) Limited functionality compared to other systems
- C) Difficulty in integration with existing machinery
- D) Inability to handle multiple control loops

Answer: A) High cost

**1832.** What is a "PID controller" used for in a PLC system?

- A) To control complex sequential processes
- B) To manage proportional, integral, and derivative control loops for continuous processes
- C) To store input data
- D) To automate ladder diagrams

Answer: B) To manage proportional, integral, and derivative control loops for continuous processes

**1833.** Which of the following is an advantage of using PLCs in industrial environments?

- A) High energy consumption
- B) High flexibility and reconfigurability
- C) Frequent failure rates
- D) Difficulty in installation

Answer: B) High flexibility and reconfigurability

**1834.** What type of memory is typically used in a PLC for storing the program logic?

- A) Flash memory
- B) Random Access Memory (RAM)
- C) Read-Only Memory (ROM)
- D) EEPROM

Answer: C) Read-Only Memory (ROM)

**1835.** Which of the following is a characteristic of a "distributed I/O" system in a PLC?

- A) All I/O modules are installed within the PLC itself
- B) I/O modules are placed remotely from the PLC and connected via communication lines
- C) It has a centralized I/O system
- D) It does not support analog inputs

Answer: B) I/O modules are placed remotely from the PLC and connected via communication lines

**1836.** What is an example of a "non-volatile" memory in a PLC?

- A) RAM
- B) ROM
- C) Cache memory
- D) Registers

Answer: B) ROM

**1837.** Which of the following is a type of "analog" input used in PLC systems?

- A) Proximity sensor
- B) Temperature sensor
- C) Push button switch
- D) Light sensor

Answer: B) Temperature sensor

**1838.** What is the main benefit of using a PLC over hard-wired relay systems?

- A) Faster processing
- B) Simplicity in control
- C) More expensive
- D) More complex wiring

Answer: A) Faster processing

**1839.** What type of signal does an "analog input" in a PLC typically handle?

- A) Digital On/Off signals
- B) Pulse signals
- C) Continuous variable signals
- D) Binary signals

Answer: C) Continuous variable signals

**1840.** What is the main function of a "counter" in a PLC program?

- A) To measure time intervals
- B) To store the control program
- C) To count occurrences of an event
- D) To control analog signals

Answer: C) To count occurrences of an event

**1841.** What is an example of a "discrete output" in a PLC system?

- A) Speed controller
- B) Temperature regulator
- C) Relay or solenoid
- D) Flow rate monitor

Answer: C) Relay or solenoid

**1842.** Which of the following components is NOT part of a PLC system?

- A) Input devices
- B) Output devices
- C) Data processing unit
- D) Heat exchanger

Answer: D) Heat exchanger

**1843.** What is a typical use case for a "micro PLC"?

- A) Large-scale industrial automation
- B) High-speed data processing
- C) Small automation applications with limited I/O
- D) Control of heavy machinery

Answer: C) Small automation applications with limited I/O

**1844.** Which programming language for PLCs is similar to flowchart logic and often used for process control?

- A) Ladder Logic
- B) Structured Text
- C) Function Block Diagram
- D) Sequential Function Chart

Answer: C) Function Block Diagram

**1845.** What does a "relay" output typically control in a PLC system?

- A) A single discrete output device like a motor or light
- B) An analog device such as a temperature sensor
- C) Digital I/O conversion
- D) Program execution flow

Answer: A) A single discrete output device like a motor or light

**1846.** What is the purpose of a "watchdog timer" in a PLC system?

- A) To prevent the PLC from overheating
- B) To ensure the PLC program is operating correctly by resetting the PLC if it hangs
- C) To track execution time of each program cycle
- D) To monitor the CPU's health

Answer: B) To ensure the PLC program is operating correctly by resetting the PLC if it hangs

**1847.** Which of the following PLC components communicates directly with the field devices?

- A) CPU
- B) Input/Output modules
- C) Power supply
- D) HMI

Answer: B) Input/Output modules

**1848.** What is a common method for connecting remote PLC I/O modules to a central controller?

- A) Wi-Fi
- B) Serial communication (RS-232, RS-485)
- C) Infrared
- D) Parallel communication

Answer: B) Serial communication (RS-232, RS-485)

**1849.** Which of the following types of memory is volatile in a PLC system?

- A) EEPROM
- B) Flash
- C) RAM
- D) ROM

Answer: C) RAM

**1850.** What does the term "sourcing input" refer to in PLC systems?

- A) A type of input where power is supplied to the field device from the PLC
- B) A type of input where the PLC provides ground
- C) An output signal that is sent to the field device
- D) An input that communicates with remote PLCs

Answer: A) A type of input where power is supplied to the field device from the PLC

**1851.** What is the function of the "shift register" instruction in PLC programming?

- A) To store values for processing
- B) To shift data values through a series of memory locations
- C) To monitor analog inputs
- D) To set up timers

Answer: B) To shift data values through a series of memory locations

**1852.** What is the most common type of relay used as a PLC output?

- A) Solid-state relay
- B) Mechanical relay
- C) Fiber optic relay
- D) Pneumatic relay

Answer: B) Mechanical relay

**1853.** Which of the following is a characteristic of "ladder logic" programming?

- A) It is based on mathematical equations
- B) It uses graphical symbols to represent logic operations
- C) It is used for controlling analog systems only
- D) It uses a text-based coding structure

Answer: B) It uses graphical symbols to represent logic operations

**1854.** What is the purpose of using "tags" in PLC programming?

- A) To track system performance
- B) To assign names to variables and memory locations for easier reference
- C) To configure I/O modules
- D) To reset PLC memory

Answer: B) To assign names to variables and memory locations for easier reference

**1855.** Which of the following best describes the role of an "HMI" (Human-Machine Interface) in a PLC system?

- A) To execute the PLC program
- B) To allow operators to interact with the control system and monitor process variables
- C) To provide power to the PLC
- D) To store data from the field devices

Answer: B) To allow operators to interact with the control system and monitor process variables

**1856.** Which of the following is the main advantage of using a "modular PLC"?

- A) Low initial cost
- B) Fixed number of I/O channels
- C) High scalability and flexibility in configuration
- D) Simplicity of programming

Answer: C) High scalability and flexibility in configuration

**1857.** What is the function of a "digital input" in a PLC?

- A) To measure continuous physical quantities
- B) To convert analog signals to digital
- C) To provide a signal indicating the presence or absence of a condition
- D) To perform calculations

Answer: C) To provide a signal indicating the presence or absence of a condition

**1858.** Which of the following is the typical voltage range for a PLC input signal?

- A) 1-5 V DC
- B) 0-24 V DC
- C) 12-48 V AC
- D) 220-240 V AC

Answer: B) 0-24 V DC

**1859.** What type of sensor is commonly used with PLCs to detect position or movement?

- A) Temperature sensor
- B) Proximity sensor
- C) Light sensor
- D) Pressure sensor

Answer: B) Proximity sensor

**1860.** In PLC systems, what is an "I/O module" used for?

- A) To execute the control program
- B) To provide interfaces for external devices like sensors and actuators
- C) To store the user program
- D) To power the PLC system

Answer: B) To provide interfaces for external devices like sensors and actuators

**1861.** What does the term "control relay" refer to in PLC programming?

- A) A relay used to perform time-based operations
- B) A relay that stores the status of the system
- C) A relay that activates or deactivates output devices based on input conditions
- D) A relay used to monitor PLC memory

Answer: C) A relay that activates or deactivates output devices based on input conditions



**1862.** Which of the following represents an advantage of using a "distributed I/O system" in a PLC?

- A) It simplifies wiring by centralizing all I/O modules
- B) It allows for long-distance communication between remote I/O modules and the controller
- C) It makes troubleshooting easier by reducing the number of I/O modules
- D) It reduces the complexity of the control program

Answer: B) It allows for long-distance communication between remote I/O modules and the controller

**1863.** What is the role of "process control" in PLC systems?

- A) To control the speed of the processor
- B) To adjust and maintain process variables such as temperature, pressure, and flow
- C) To generate outputs for display purposes
- D) To log system data for future analysis

Answer: B) To adjust and maintain process variables such as temperature, pressure, and flow

**1864.** Which PLC programming language is best suited for continuous control of complex processes?

- A) Ladder Logic
- B) Structured Text
- C) Function Block Diagram
- D) Sequential Function Chart

Answer: C) Function Block Diagram

**1865.** In which of the following applications would a "PID controller" be commonly used within a PLC?

- A) Control of motor start/stop functions
- B) Temperature regulation in a furnace or oven
- C) Counting items on a production line
- D) Monitoring input voltage levels

Answer: B) Temperature regulation in a furnace or oven

**1866.** What is a "data block" in PLC programming?

- A) A set of program instructions for controlling a process
- B) A section of memory used to store related data values
- C) A type of input/output signal
- D) A hardware component used to interface with external devices

Answer: B) A section of memory used to store related data values

**1867.** What does the "process image" in a PLC refer to?

- A) A diagram showing the layout of the PLC
- B) The stored representation of the current input and output states
- C) The graphical representation of the control program
- D) A log of recent errors and faults

Answer: B) The stored representation of the current input and output states

**1868.** What does the term "scanning" refer to in a PLC system?

- A) The process of checking for input errors
- B) The execution of the control program in a cycle, reading inputs and updating outputs
- C) The reading of outputs in real-time
- D) The frequency of communication with external devices

Answer: B) The execution of the control program in a cycle, reading inputs and updating outputs

**1869.** Which of the following is a key feature of a "smart" I/O module in a PLC system?

- A) It can process and execute control logic without involving the CPU
- B) It can store user programs
- C) It requires no external power supply
- D) It automatically adjusts the PLC's scan cycle

Answer: A) It can process and execute control logic without involving the CPU

**1870.** In PLC programming, what does the "OR" operation do?

- A) It checks if both inputs are false
- B) It checks if at least one input is true
- C) It inverts the input signals
- D) It sets the output to true when all inputs are true

Answer: B) It checks if at least one input is true

**1871.** Which of the following is a common use of "HMI" (Human-Machine Interface) in PLC systems?

- A) Writing the control program
- B) Displaying information such as system status and alarms to operators
- C) Monitoring the PLC's power supply
- D) Controlling I/O modules

Answer: B) Displaying information such as system status and alarms to operators

**1872.** What is the primary role of a "load cell" in PLC systems?

- A) To monitor pressure in pipes
- B) To detect the presence of an object
- C) To measure force or weight
- D) To measure temperature

Answer: C) To measure force or weight

**1873.** Which of the following describes the function of a "status bit" in a PLC?

- A) It stores the input data
- B) It indicates the current state of the PLC's outputs
- C) It is used to track the status of a process or variable within the program
- D) It is used to communicate with external devices

Answer: C) It is used to track the status of a process or variable within the program

**1874.** What does "PLC redundancy" refer to?

- A) Using multiple PLCs in a parallel configuration to ensure system reliability
- B) The ability to store data redundantly for backup purposes
- C) The use of backup power supplies for the PLC
- D) The ability to operate without human intervention

Answer: A) Using multiple PLCs in a parallel configuration to ensure system reliability

**1875.** What is the main advantage of "solid-state relays" over traditional mechanical relays in PLC systems?

- A) Faster switching times and no moving parts
- B) Lower cost
- C) Higher power output
- D) Easier to program

Answer: A) Faster switching times and no moving parts

**1876.** In which scenario would "Ethernet/IP" be commonly used in a PLC system?

- A) To store program data
- B) To enable communication between multiple PLCs and other networked devices
- C) To control input signals from sensors
- D) To operate the I/O modules directly

Answer: B) To enable communication between multiple PLCs and other networked devices

**1877.** Which of the following is the primary function of a "remote I/O" module in a PLC system?

- A) To execute control logic
- B) To provide user input
- C) To expand the PLC's I/O capabilities by placing I/O devices far from the controller
- D) To store PLC programs

Answer: C) To expand the PLC's I/O capabilities by placing I/O devices far from the controller

**1878.** What is the main advantage of using a "redundant power supply" in PLC systems?

- A) It reduces the need for programming
- B) It ensures continuous operation in case of a failure in the primary power supply
- C) It increases the speed of the PLC
- D) It enhances I/O performance

Answer: B) It ensures continuous operation in case of a failure in the primary power supply

**1879.** In PLC systems, which of the following is typically used to convert analog signals to digital signals?

- A) Analog-to-digital converter (ADC)
- B) Digital-to-analog converter (DAC)
- C) Voltage regulator
- D) Signal amplifier

Answer: A) Analog-to-digital converter (ADC)

**1880.** What does a "data logger" do in a PLC system?

- A) It stores control programs
- B) It monitors real-time inputs and stores them for analysis later
- C) It stores the PLC's configuration data
- D) It generates output signals based on input conditions

Answer: B) It monitors real-time inputs and stores them for analysis later

**1881.** What is the purpose of a "pre-signal" in PLC systems?

- A) To process data before an event occurs
- B) To provide a signal to the operator
- C) To trigger an output signal before the input condition is met
- D) To enable the PLC to communicate with external devices

Answer: C) To trigger an output signal before the input condition is met

**1882.** What does the "JUMP" instruction do in a PLC program?

- A) It executes a block of instructions in parallel
- B) It skips over a specified block of code
- C) It repeats a set of instructions
- D) It transfers data between memory locations

Answer: B) It skips over a specified block of code

**1883.** What is the purpose of the "FIFO" instruction in a PLC?

- A) To store input data
- B) To control the execution sequence of the program
- C) To manage and process data in the order it was received (First In, First Out)
- D) To monitor the health of the PLC

Answer: C) To manage and process data in the order it was received (First In, First Out)

**1884.** Which of the following best describes a "sequencer" in PLC programming?

- A) A programming construct that defines the order of operations or steps in a process
- B) A type of digital sensor used for counting
- C) A method to manage multiple timers simultaneously
- D) A method to read analog signals

Answer: A) A programming construct that defines the order of operations or steps in a process

**1885.** In PLC systems, what does the term "hot standby" refer to?

- A) A backup system that takes over immediately if the primary system fails
- B) A maintenance process that powers down the PLC for upgrades
- C) The process of checking the status of external devices
- D) A system that automatically resets itself after a fault

Answer: A) A backup system that takes over immediately if the primary system fails

**1886.** Which of the following is NOT typically an output device in a PLC system?

- A) Relay
- B) Solenoid
- C) Sensor
- D) Motor

Answer: C) Sensor

**1887.** What is a "jump to subroutine" instruction used for in a PLC program?

- A) To repeat the same set of instructions multiple times
- B) To execute a predefined block of code and then return to the main program
- C) To initiate external communication
- D) To monitor real-time data from sensors

Answer: B) To execute a predefined block of code and then return to the main program

**1888.** What does the "MCR" (Master Control Reset) instruction do in PLC programming?

- A) It resets the entire PLC system
- B) It disables the program execution until a reset condition is met
- C) It stops the execution of certain logic or operations within the program
- D) It enables debugging mode for the PLC

Answer: C) It stops the execution of certain logic or operations within the program

**1889.** What type of input module is used to interface with a temperature sensor in a PLC?

- A) Analog input module
- B) Digital input module
- C) Relay module
- D) Serial communication module

Answer: A) Analog input module

**1890.** Which of the following is an example of an application for a PLC system with "remote I/O"?

- A) An industrial robot arm for assembling parts
- B) A traffic light control system located far from the PLC controller
- C) A motor control circuit within a small machine
- D) A conveyor belt that operates entirely within one factory area

Answer: B) A traffic light control system located far from the PLC controller

**1891.** Which of the following is a disadvantage of using a "micro PLC"?

- A) It lacks sufficient memory to handle large programs
- B) It is not compatible with digital devices
- C) It does not support expansion modules
- D) It has slower processing speeds than large PLCs

Answer: A) It lacks sufficient memory to handle large programs

**1892.** What is the main reason for using "interrupts" in a PLC system?

- A) To speed up the execution of the control program
- B) To respond immediately to time-critical events while the program is running
- C) To reset the system after an error
- D) To execute tasks sequentially

Answer: B) To respond immediately to time-critical events while the program is running

**1893.** Which of the following PLC programming languages is typically used for continuous process control systems?

- A) Ladder Logic
- B) Structured Text
- C) Function Block Diagram
- D) Sequential Function Chart

Answer: C) Function Block Diagram



**1894.** What does the "XIC" instruction represent in ladder logic programming?

- A) A contact that is energized when the input is true
- B) A contact that is energized when the input is false
- C) A timer function
- D) A relay function

Answer: A) A contact that is energized when the input is true

**1895.** What is the primary advantage of using a "modular PLC" over a "compact PLC"?

- A) Greater ability to expand I/O capabilities
- B) Faster scan time
- C) Lower cost
- D) Simpler programming

Answer: A) Greater ability to expand I/O capabilities

**1896.** What is the purpose of the "shift register" instruction in a PLC system?

- A) To store data values in a memory array
- B) To convert analog signals to digital
- C) To control the flow of electricity through the system
- D) To shift data through a series of memory locations in a sequence

Answer: D) To shift data through a series of memory locations in a sequence

**1897.** Which of the following is an example of a "pulse output" in a PLC system?

- A) A relay that turns on and off
- B) A signal that is sent for a short duration, often used to control motors
- C) A continuous output signal used to control a variable valve
- D) An output that provides a constant current signal

Answer: B) A signal that is sent for a short duration, often used to control motors

**1898.** Which of the following is NOT a function of a PLC's CPU?

- A) Executing the control program
- B) Storing the system's configuration
- C) Monitoring input and output devices
- D) Powering the system

Answer: D) Powering the system

**1899.** What is the purpose of an "analog output" in a PLC system?

- A) To send discrete ON/OFF signals to external devices
- B) To provide a continuous signal that varies in magnitude
- C) To execute control logic
- D) To monitor PLC memory

Answer: B) To provide a continuous signal that varies in magnitude

**1900.** In PLC programming, what is the purpose of the "TON" (Timer On Delay) instruction?

- A) To delay the execution of a program section for a set time
- B) To count the number of events in a system
- C) To trigger an output immediately when an input is received
- D) To monitor the status of an analog sensor

Answer: A) To delay the execution of a program section for a set time

**1901.** Which of the following describes a "digital output" in a PLC system?

- A) A signal that continuously varies in magnitude
- B) A signal that can be either on or off (binary signal)
- C) A signal used for communication between PLCs
- D) A signal that operates in real-time with analog inputs

Answer: B) A signal that can be either on or off (binary signal)

**1902.** Which of the following is the primary use of "industrial Ethernet" in a PLC system?

- A) To increase processing speed
- B) To facilitate communication between PLCs and other devices in a network
- C) To store control programs
- D) To measure physical parameters like temperature

Answer: B) To facilitate communication between PLCs and other devices in a network

**1903.** What does the term "scan cycle" in a PLC system refer to?

- A) The time it takes to read and process input signals
- B) The time it takes to read inputs, execute the program, and update outputs
- C) The frequency at which the PLC performs system diagnostics
- D) The amount of time the PLC takes to store program data

Answer: B) The time it takes to read inputs, execute the program, and update outputs

**1904.** Which programming language for PLCs is most similar to high-level programming languages such as C or Pascal?

- A) Ladder Logic
- B) Function Block Diagram
- C) Structured Text
- D) Sequential Function Chart

Answer: C) Structured Text

**1905.** Which of the following components is part of the PLC's power supply?

- A) Input/output modules
- B) CPU
- C) Relay outputs
- D) Voltage converter

Answer: D) Voltage converter

**1906.** In PLC programming, what is the purpose of the "TON" and "TOF" instructions?

- A) To create a time-based delay
  - B) To manage program loops
  - C) To monitor input devices
  - D) To perform logical operations
- Answer: A) To create a time-based delay

**1907.** Which type of PLC memory is used for storing the user's program permanently?

- A) ROM
  - B) RAM
  - C) EEPROM
  - D) Flash memory
- Answer: C) EEPROM

**1908.** In a PLC system, what does the "CTU" instruction stand for?

- A) Counter Up
  - B) Counter Timer Unit
  - C) Clear Timer Unit
  - D) Counter Down
- Answer: A) Counter Up

**1909.** What is a primary benefit of using "structured text" as a PLC programming language?

- A) It is best suited for sequential processes
  - B) It can handle complex calculations and logic with ease
  - C) It is visually easy to understand
  - D) It supports graphical control elements
- Answer: B) It can handle complex calculations and logic with ease

**1910.** What type of communication is commonly used between a PLC and a Human-Machine Interface (HMI)?

- A) Ethernet
  - B) RS-232
  - C) RS-485
  - D) All of the above
- Answer: D) All of the above

**1911.** What is an example of a "field device" in a PLC system?

- A) PLC CPU
  - B) I/O module
  - C) Sensor or actuator
  - D) Power supply
- Answer: C) Sensor or actuator

**1912.** What does the "MOV" instruction do in PLC programming?

- A) It moves a value from one location to another in memory
  - B) It monitors real-time system status
  - C) It resets a counter or timer
  - D) It performs logical comparison between two values
- Answer: A) It moves a value from one location to another in memory

**1913.** In a PLC system, what does the term "output addressing" refer to?

- A) The process of programming outputs
  - B) The method of connecting output devices to the PLC
  - C) The use of memory addresses to identify output devices
  - D) The configuration of input/output communication channels
- Answer: C) The use of memory addresses to identify output devices

**1914.** What is the main difference between a "static" and "dynamic" I/O system in a PLC?

- A) A static I/O system requires no configuration, while a dynamic I/O system is configurable
  - B) A static I/O system is fixed, while a dynamic I/O system can be adjusted during operation
  - C) A static I/O system uses analog signals, while a dynamic system uses digital signals
  - D) A static I/O system is used only in small PLCs
- Answer: B) A static I/O system is fixed, while a dynamic I/O system can be adjusted during operation

**1915.** Which of the following types of devices is most commonly controlled using a PLC?

- A) Robots
  - B) HVAC systems
  - C) Conveyor belts
  - D) All of the above
- Answer: D) All of the above

**1916.** Which of the following PLC programming languages is used for representing control systems using graphic blocks?

- A) Ladder Logic
  - B) Function Block Diagram
  - C) Structured Text
  - D) Instruction List
- Answer: B) Function Block Diagram

**1917.** What is the primary purpose of using "PID control" in a PLC system?

- A) To handle simple ON/OFF control
  - B) To adjust and maintain continuous process variables such as temperature, pressure, and flow
  - C) To detect faults in the system
  - D) To store input data for analysis
- Answer: B) To adjust and maintain continuous process variables such as temperature,

pressure, and flow

**1918.** Which of the following best describes the function of a "control relay" in a PLC system?

A) It amplifies the control signals

B) It holds the system status

C) It acts as an intermediary to activate or deactivate devices based on input conditions

D) It stores the control program

Answer: C) It acts as an intermediary to activate or deactivate devices based on input conditions

**1919.** What is the purpose of the "RTO" (Retentive Timer On Delay) instruction in PLC programming?

A) To retain the timer value even if the power is lost

B) To create a time delay before an event occurs

C) To reset a timer

D) To monitor analog sensors

Answer: A) To retain the timer value even if the power is lost

**1920.** In which scenario would "analog input" be used in a PLC system?

A) To measure temperature, pressure, or flow

B) To detect the presence of a part on a conveyor

C) To turn a motor on or off

D) To count the number of items passing through a sensor

Answer: A) To measure temperature, pressure, or flow

**1921.** What does the "MOV" instruction do in ladder logic?

A) It moves data from one memory location to another

B) It performs a mathematical operation on data

C) It checks if a condition is true or false

D) It resets the output

Answer: A) It moves data from one memory location to another

**1922.** What is the main purpose of using a "communication module" in a PLC system?

- A) To process the control logic
- B) To communicate with other PLCs or external devices
- C) To store data in memory
- D) To interface with analog sensors

Answer: B) To communicate with other PLCs or external devices

**1923.** In PLC systems, what does "scan time" refer to?

- A) The time it takes to execute the user program once
- B) The time it takes for an input signal to reach the CPU
- C) The time it takes to download the program from the computer to the PLC
- D) The time it takes to calibrate sensors

Answer: A) The time it takes to execute the user program once

**1924.** Which of the following PLC programming languages uses graphical symbols to represent control devices and connections?

- A) Ladder Logic
- B) Structured Text
- C) Sequential Function Chart
- D) Function Block Diagram

Answer: A) Ladder Logic

**1925.** In PLC programming, what does the "NOP" instruction do?

- A) It performs a mathematical operation
- B) It forces an output to a certain state
- C) It does nothing, acting as a placeholder
- D) It resets the system

Answer: C) It does nothing, acting as a placeholder



**1926.** What is the key benefit of using a "distributed control system" (DCS) instead of a centralized PLC system?

- A) Simplified programming
- B) Reduced wiring and communication costs
- C) Better process control in distributed and large-scale systems
- D) Easier maintenance and repair

Answer: C) Better process control in distributed and large-scale systems

**1927.** What does the "CNT" instruction in PLC programming do?

- A) It counts up or down based on input signals
- B) It stores a counter value
- C) It compares input signals
- D) It controls the program flow

Answer: A) It counts up or down based on input signals

**1928.** Which of the following is an example of a "discrete" input device for a PLC?

- A) Thermocouple
- B) Pressure sensor
- C) Push button
- D) Flowmeter

Answer: C) Push button

**1929.** Which communication protocol is commonly used for connecting PLCs to remote I/O systems?

- A) Modbus
- B) RS-232
- C) Profibus
- D) Ethernet/IP

Answer: A) Modbus

**1930.** What type of memory in a PLC is used to store the user's program and configurations?

- A) RAM
- B) ROM
- C) EEPROM
- D) Flash memory

Answer: C) EEPROM

**1931.** In PLC systems, which instruction is used to reset a counter to zero?

- A) RES
- B) CLR
- C) CNT
- D) RST

Answer: B) CLR

**1932.** Which of the following is an example of a "continuous" process controlled by a PLC system?

- A) Conveyor belt operation
- B) Temperature control in a furnace
- C) Motor start/stop control
- D) Part count on a production line

Answer: B) Temperature control in a furnace

**1933.** What is the role of the "analog output" module in a PLC system?

- A) To convert analog signals into discrete values
- B) To send continuous signals that vary in magnitude to external devices
- C) To detect digital input values
- D) To store data from external sensors

Answer: B) To send continuous signals that vary in magnitude to external devices

**1934.** What does the "XIO" instruction represent in ladder logic?

- A) A contact that is open when the input is true
- B) A timer function
- C) A memory bit
- D) A sensor that monitors input signals

Answer: A) A contact that is open when the input is true

**1935.** What is the purpose of a "set" instruction in a PLC program?

- A) To initiate a process
- B) To stop the execution of a process
- C) To set a bit to true
- D) To move data between memory locations

Answer: C) To set a bit to true

**1936.** What type of input device would most likely use a "proximity sensor" in a PLC-controlled system?

- A) Temperature measurement
- B) Position or movement detection
- C) Pressure monitoring
- D) Light intensity measurement

Answer: B) Position or movement detection

**1937.** What is the main purpose of a "power failure recovery" feature in a PLC?

- A) To automatically adjust the timing cycles
- B) To restore the PLC system to its previous state after a power outage
- C) To provide extra backup power during operation
- D) To optimize input signal processing

Answer: B) To restore the PLC system to its previous state after a power outage

**1938.** What is the advantage of using "Ethernet-based communication" for PLC systems?

- A) High speed and ease of integration with other networked devices
- B) Easier programming for complex systems
- C) Better fault tolerance and recovery mechanisms
- D) Low cost of implementation

Answer: A) High speed and ease of integration with other networked devices

**1939.** In a PLC, what type of memory is used to store the PLC program while the system is powered down?

- A) ROM
- B) RAM
- C) Flash memory
- D) EEPROM

Answer: C) Flash memory

**1940.** What does the "TOF" (Timer Off Delay) instruction do in a PLC program?

- A) It creates a delay before an output is activated
- B) It creates a delay before an output is deactivated
- C) It monitors input signals continuously
- D) It resets the timer to its initial state

Answer: B) It creates a delay before an output is deactivated

**1941.** Which of the following PLC devices typically interfaces with high-power actuators like motors?

- A) Digital output module
- B) Relay output module
- C) Analog output module
- D) Input module

Answer: B) Relay output module

**1942.** In a PLC system, which of the following is an example of a "discrete output"?

- A) A motor speed control
- B) A binary actuator like a solenoid valve
- C) A temperature control signal
- D) A continuous analog signal

Answer: B) A binary actuator like a solenoid valve

**1943.** What does the "MCR" (Master Control Reset) instruction do in ladder logic?

- A) Resets the system's configuration
- B) Clears a specified memory area
- C) Resets the entire program execution sequence
- D) Stops execution of the program and resets the conditions

Answer: D) Stops execution of the program and resets the conditions

**1944.** In a PLC system, what is typically controlled by an "analog input" module?

- A) A temperature sensor
- B) A switch
- C) A push button
- D) A proximity sensor

Answer: A) A temperature sensor

**1945.** What is the function of a "diagnostic display" in a PLC?

- A) To indicate the status of input/output devices
- B) To display real-time data from sensors
- C) To show system errors and troubleshooting information
- D) To execute control programs

Answer: C) To show system errors and troubleshooting information

**1946.** What does a "counter" instruction do in a PLC?

- A) It delays the activation of outputs
- B) It counts the number of times a condition is true
- C) It processes analog signals
- D) It resets timers

Answer: B) It counts the number of times a condition is true

**1947.** Which of the following PLC devices is responsible for converting digital signals to analog?

- A) Analog-to-digital converter (ADC)
- B) Digital-to-analog converter (DAC)
- C) Signal amplifier
- D) Relay module

Answer: B) Digital-to-analog converter (DAC)

**1948.** In a PLC program, which instruction is used to turn an output on or off based on a condition?

- A) Set/Reset
- B) MOVE
- C) JUMP
- D) AND

Answer: A) Set/Reset

**1949.** What does the "AND" instruction in ladder logic represent?

- A) It forces an output to turn on
- B) It combines two inputs, and the output is true only when both inputs are true
- C) It resets a timer
- D) It compares two inputs

Answer: B) It combines two inputs, and the output is true only when both inputs are true

**1950.** Which PLC instruction is used to toggle the state of an output?

- A) NOT
- B) TOF
- C) SET
- D) TGL

Answer: D) TGL

**1951.** What is the main advantage of using "remote I/O modules" in PLC systems?

- A) Reduced wiring complexity
- B) Increased processing speed
- C) Improved control of local sensors
- D) Simplified program logic

Answer: A) Reduced wiring complexity

**1952.** What is the main purpose of using a "data bus" in a PLC?

- A) To provide communication between the CPU and peripheral devices
- B) To store program data temporarily
- C) To monitor external sensor inputs
- D) To manage analog signals

Answer: A) To provide communication between the CPU and peripheral devices

**1953.** What type of sensor typically uses "digital I/O" in a PLC?

- A) Temperature sensor
- B) Pressure sensor
- C) Limit switch
- D) Flow sensor

Answer: C) Limit switch

**1954.** What is the purpose of the "Shift Register" instruction in a PLC?

- A) To move data from one register to another sequentially
- B) To control the position of actuators
- C) To set the state of an output based on a sequence of inputs
- D) To count up or down based on a set value

Answer: A) To move data from one register to another sequentially

**1955.** In PLC systems, which of the following best describes "safety relays"?

- A) They monitor system performance and provide feedback
- B) They ensure safe operation by interrupting dangerous outputs when necessary
- C) They amplify signals to improve accuracy
- D) They store data for later analysis

Answer: B) They ensure safe operation by interrupting dangerous outputs when necessary

**1956.** What is the primary function of a "PLC interface module"?

- A) To allow external devices to communicate with the PLC
- B) To store input/output data
- C) To convert signals to control actions
- D) To process control programs

Answer: A) To allow external devices to communicate with the PLC

**1957.** What does the "NOP" (No Operation) instruction do in PLC programming?

- A) It skips the current instruction and moves to the next one
- B) It performs a logical operation
- C) It holds the value of a variable
- D) It initializes system variables

Answer: A) It skips the current instruction and moves to the next one



**1958.** Which type of PLC communication is best for short-range data transmission between devices?

- A) Bluetooth
- B) RS-485
- C) Wi-Fi
- D) Zigbee

Answer: B) RS-485

**1959.** What is the primary difference between "discrete" and "analog" inputs in a PLC?

- A) Discrete inputs send continuous data, while analog inputs send binary signals
- B) Discrete inputs represent a true/false state, while analog inputs represent varying signals
- C) Analog inputs use more memory than discrete inputs
- D) Discrete inputs are slower than analog inputs

Answer: B) Discrete inputs represent a true/false state, while analog inputs represent varying signals

**1960.** What is the function of the "PID" control instruction in a PLC?

- A) To create a delay before activating outputs
- B) To control analog signals with proportional, integral, and derivative adjustments
- C) To count pulses from sensors
- D) To reset system variables

Answer: B) To control analog signals with proportional, integral, and derivative adjustments

**1961.** In a PLC, what does the "RES" instruction do?

- A) It resets a counter or timer to zero
- B) It sets a value to true
- C) It moves data between memory locations
- D) It executes a subroutine

Answer: A) It resets a counter or timer to zero

**1962.** What is the purpose of an "HMI" (Human-Machine Interface) in a PLC system?

- A) To provide a graphical interface for operators to monitor and control the system
- B) To process input signals
- C) To store the program data
- D) To control system logic directly

Answer: A) To provide a graphical interface for operators to monitor and control the system

**1963.** Which PLC instruction is used to execute a block of code repeatedly?

- A) JUMP
- B) LOOP
- C) SBR
- D) MCR

Answer: B) LOOP

**1964.** What is the purpose of an "analog output" in a PLC system?

- A) To control discrete devices
- B) To generate continuous variable signals based on program logic
- C) To provide feedback to operators
- D) To store data in a non-volatile memory

Answer: B) To generate continuous variable signals based on program logic

**1965.** What is the main role of a "safety PLC"?

- A) To manage communications between devices
- B) To monitor and ensure safe operation in hazardous environments
- C) To provide high-speed data processing
- D) To control all PLC programming logic

Answer: B) To monitor and ensure safe operation in hazardous environments

**1966.** What is the primary function of a "watchdog timer" in a PLC system?

- A) To monitor the temperature of the CPU
- B) To reset the PLC in case of failure to execute properly
- C) To provide feedback for troubleshooting
- D) To adjust the timing of control operations

Answer: B) To reset the PLC in case of failure to execute properly

**1967.** Which of the following best describes a "virtual PLC"?

- A) A physical PLC that operates in a computer simulation environment
- B) A PLC that controls virtual machines in a digital environment
- C) A PLC that is completely software-based and runs on a computer
- D) A PLC used to simulate real-world PLC systems for training

Answer: C) A PLC that is completely software-based and runs on a computer

**1968.** What does the "XIC" (Examine If Closed) instruction in a PLC program do?

- A) It checks if an input contact is closed and evaluates to true if it is
- B) It checks if a counter has reached a set value
- C) It activates an output when a condition is met
- D) It compares two analog inputs

Answer: A) It checks if an input contact is closed and evaluates to true if it is

**1969.** What does the "NOP" (No Operation) instruction typically represent in a PLC program?

- A) No change to the output
- B) A placeholder where no action is required
- C) A pause in program execution
- D) A termination command for the system

Answer: B) A placeholder where no action is required

**1970.** In a PLC, which type of memory stores the user program?

- A) RAM
- B) ROM
- C) EEPROM
- D) Flash memory

Answer: B) ROM

**1971.** What is the advantage of using a "relay output module" in a PLC system?

- A) It provides high-speed data processing
- B) It controls high-power devices safely
- C) It reduces the number of sensors needed
- D) It allows for analog input processing

Answer: B) It controls high-power devices safely

**1972.** What does the "XIO" (Examine If Open) instruction do in a PLC program?

- A) It checks if an input contact is open and evaluates to true if it is
- B) It checks if an input contact is closed and evaluates to true if it is
- C) It resets a counter
- D) It executes a subroutine

Answer: A) It checks if an input contact is open and evaluates to true if it is

**1973.** Which of the following is used for storing long-term data in PLC systems?

- A) RAM
- B) ROM
- C) EEPROM
- D) Flash memory

Answer: C) EEPROM

**1974.** What is the primary function of the "Ladder Logic" programming language in PLC systems?

- A) It represents control programs using graphical symbols that mimic relay logic
- B) It converts digital signals into analog
- C) It stores data for processing
- D) It provides a command-line interface for system setup

Answer: A) It represents control programs using graphical symbols that mimic relay logic

**1975.** What does the "SBR" instruction in a PLC program represent?

- A) It stores data
- B) It calls a subroutine
- C) It resets a memory block
- D) It stops the execution of a program

Answer: B) It calls a subroutine

**1976.** In PLC systems, what is typically used to prevent electrical noise from affecting the inputs?

- A) Surge protectors
- B) Filters
- C) Isolation relays
- D) Light sensors

Answer: B) Filters

**1977.** What is the purpose of the "OTL" (Output Energize) instruction in ladder logic?

- A) It energizes the output coil
- B) It de-energizes the output coil
- C) It performs a logical operation
- D) It sets a counter value

Answer: A) It energizes the output coil

**1978.** Which of the following describes a "counter" in PLC programming?

- A) A device used to perform arithmetic operations
- B) A variable that counts the number of times a condition is met
- C) A signal used to activate a relay
- D) A timer that counts in milliseconds

Answer: B) A variable that counts the number of times a condition is met

**1979.** What does the "PID" instruction in a PLC program primarily control?

- A) Discrete on/off devices
- B) Continuous variables like temperature, pressure, and flow
- C) Digital input and output states
- D) Sequential processing of events

Answer: B) Continuous variables like temperature, pressure, and flow

**1980.** In PLCs, what is typically used to detect the status of a device or sensor?

- A) Digital input modules
- B) Relay output modules
- C) Analog output modules
- D) Programmable data logging systems

Answer: A) Digital input modules

**1981.** Which of the following protocols is most commonly used for communication between PLCs and SCADA systems?

- A) Modbus
- B) RS-232
- C) Profibus
- D) CAN bus

Answer: A) Modbus

**1982.** What type of input signal is best detected by an analog input module in a PLC?

- A) Binary signals like ON/OFF states
  - B) Continuous voltage or current signals
  - C) Pulse signals
  - D) Digital communication signals
- Answer: B) Continuous voltage or current signals

**1983.** In a PLC, what is a "bit" used for?

- A) Storing a single binary value, either 0 or 1
  - B) Storing a memory address
  - C) Representing complex data structures
  - D) Performing mathematical operations
- Answer: A) Storing a single binary value, either 0 or 1

**1984.** Which of the following best describes the use of an "HMI" in a PLC system?

- A) It provides the PLC with an input signal
  - B) It provides a visual interface for the operator to monitor and control the process
  - C) It stores the user program in the PLC
  - D) It communicates between different PLCs
- Answer: B) It provides a visual interface for the operator to monitor and control the process

**1985.** In a PLC system, what is a "reset" instruction used for?

- A) To stop the program execution
  - B) To set a timer or counter to its initial value
  - C) To store data in memory
  - D) To communicate with remote devices
- Answer: B) To set a timer or counter to its initial value

**1986. Which of the following is a common advantage of using a "modular PLC"?**

- A) Lower cost for small systems
- B) Flexibility to expand by adding new modules as needed
- C) Better performance with complex operations
- D) Simplicity in programming

**Answer: B) Flexibility to expand by adding new modules as needed**

**b) Relay Logic Automatic Control**

**1987. What is the main function of a relay in an automatic control system?**

- A) To convert electrical energy into mechanical energy
- B) To amplify the signal in the circuit
- C) To open or close contacts in a circuit based on the input signal
- D) To store electrical energy for later use

**Answer: C) To open or close contacts in a circuit based on the input signal**

**1988. In a relay logic control system, what happens when the relay coil is energized?**

- A) The relay contacts open
- B) The relay contacts close
- C) The relay does not change position
- D) The relay coil is disconnected from the circuit

**Answer: B) The relay contacts close**

**1989. What is the function of a normally open (NO) contact in a relay logic circuit?**

- A) It allows current to flow when the relay is not energized
- B) It does not allow current to flow when the relay is energized
- C) It allows current to flow when the relay is energized
- D) It stops the current when the relay is not energized

**Answer: C) It allows current to flow when the relay is energized**

**1990. Which of the following represents the state of a normally closed (NC) contact when the relay is energized?**

- A) The contact is open
- B) The contact is closed
- C) The contact is in a state of change
- D) The contact no longer exists

**Answer: A) The contact is open**



**1991. In relay logic control, what type of contact is used to implement a basic AND logic operation?**

- A) Series connected NO contacts
- B) Parallel connected NO contacts
- C) Series connected NC contacts
- D) Parallel connected NC contacts

**Answer: A) Series connected NO contacts**

**1992. What type of logic function is created by connecting two relays in parallel?**

- A) AND function
- B) OR function
- C) NOT function
- D) XOR function

**Answer: B) OR function**

**1993. Which of the following can be used to reset a latch in a relay logic control system?**

- A) Energizing a coil that is normally open
- B) De-energizing a coil connected in series with a latch
- C) Closing a normally closed contact
- D) Pressing a momentary push button

**Answer: B) De-energizing a coil connected in series with a latch**

**1994. What is the primary purpose of an interlock in a relay control circuit?**

- A) To increase the relay's power
- B) To prevent simultaneous energization of conflicting outputs
- C) To delay the operation of the relay
- D) To amplify the input signal

**Answer: B) To prevent simultaneous energization of conflicting outputs**

**1995. In a ladder diagram, what does a vertical line represent?**

- A) A relay coil
- B) A contact in the circuit
- C) A power supply
- D) A connection between different rungs

**Answer: C) A power supply**

**1996. In a relay control circuit, a timer is often used for what purpose?**

- A) To store the relay's state
- B) To delay the operation of a relay or output device
- C) To amplify a signal
- D) To maintain continuous current flow

**Answer: B) To delay the operation of a relay or output device**

**1997. Which of the following is a common type of relay used in relay logic circuits?**

- A) Solenoid relay
- B) Thermal relay
- C) Magnetic relay
- D) Diode relay

**Answer: C) Magnetic relay**

**1998. In a relay logic control system, what is a "latching relay" used for?**

- A) To store the state of the relay when it is de-energized
- B) To control the amount of current flowing through the circuit
- C) To change the relay's state in response to an input signal
- D) To reverse the polarity of the signal

**Answer: A) To store the state of the relay when it is de-energized**

**1999. How is a relay coil typically energized in a relay logic control system?**

- A) By closing a contact
- B) By increasing the voltage to the coil
- C) By applying a DC current
- D) By connecting to an AC power supply

**Answer: B) By increasing the voltage to the coil**

**2000. What is the purpose of a normally open contact in a relay logic control system?**

- A) It allows current to pass when the relay is energized
- B) It allows current to pass when the relay is de-energized
- C) It blocks current when the relay is energized
- D) It allows current only when the relay coil is disconnected

**Answer: A) It allows current to pass when the relay is energized**

**2001. Which of the following represents a relay that will energize only when both conditions are true?**

- A) OR logic
- B) AND logic
- C) NOT logic
- D) XOR logic

**Answer: B) AND logic**

**2002. In a relay control circuit, what is an example of a control signal?**

- A) An AC voltage that powers the relay coil
- B) A sensor output that triggers the relay
- C) A transformer output that adjusts the voltage
- D) A motor output that drives the load

**Answer: B) A sensor output that triggers the relay**

**2003. 17. Which component in a relay control system is typically used to isolate different parts of the circuit?**

- A) Contactor
- B) Relay coil
- C) Relay contact
- D) Transformer

**Answer: C) Relay contact**

**2004. Which of the following is a common failure mode of relays in automatic control systems?**

- A) Contact corrosion
- B) Improper voltage ratings
- C) Mechanical failure of the relay coil
- D) All of the above

**Answer: D) All of the above**

**2005. How does a relay in a ladder logic circuit control the operation of an output device?**

- A) By changing the phase of the AC signal
- B) By controlling the current that flows through the output device
- C) By amplifying the input signal to drive the output device
- D) By storing the current state of the system

**Answer: B) By controlling the current that flows through the output device**

**2006. What happens in a relay logic circuit when the relay is de-energized?**

- A) The relay contacts close
- B) The relay contacts open
- C) The relay coil becomes magnetized
- D) The relay will continue to operate without changes

**Answer: B) The relay contacts open**

**2007. What is the typical response of a relay when the coil is energized in a circuit?**

- A) The relay contacts close
- B) The relay contacts open
- C) The relay stores a memory of the previous state
- D) The relay amplifies the signal

**Answer: A) The relay contacts close**

**2008. Which of the following statements is true regarding normally closed (NC) contacts in a relay control system?**

- A) They allow current when the relay is energized
- B) They interrupt the current when the relay is energized
- C) They allow current when the relay is not energized
- D) They reverse the current when the relay is energized

**Answer: B) They interrupt the current when the relay is energized**

**2009. Which of the following is a typical application of relay logic in industrial automation?**

- A) PLC programming
- B) Motor control circuits
- C) Variable frequency drive systems
- D) Signal amplifiers

**Answer: B) Motor control circuits**

**2010. In a relay logic circuit, what determines the relay's switching action?**

- A) The voltage across the relay coil
- B) The current passing through the load
- C) The frequency of the AC signal
- D) The temperature of the circuit

**Answer: A) The voltage across the relay coil**

**2011. What is an example of a condition that would activate a relay in a relay logic system?**

- A) An increase in current to the relay coil
- B) A decrease in voltage across the relay coil
- C) A change in the temperature of the relay coil
- D) A sudden interruption in the electrical supply

**Answer: A) An increase in current to the relay coil**

**2012. What is the effect of a "push button" in a relay logic control circuit?**

- A) It resets the relay's state
- B) It energizes the relay coil to change the relay's state
- C) It increases the voltage in the circuit
- D) It powers the output device directly

**Answer: B) It energizes the relay coil to change the relay's state**

**2013. What is the most common type of control system used in manufacturing automation?**

- A) Pneumatic control systems
- B) Hydraulic control systems
- C) Relay logic control systems
- D) Fluidic control systems

**Answer: C) Relay logic control systems**

**2014. Which of the following components in a relay logic circuit is used to change the state of the system based on a condition or input?**

- A) Timer
- B) Relay
- C) Push button
- D) Capacitor

**Answer: B) Relay**

**2015. Which logic operation does a relay control system commonly implement when two inputs must be true to change the output?**

- A) OR operation
- B) AND operation
- C) XOR operation
- D) NOR operation

**Answer: B) AND operation**

**2016. Which logic operation does a relay control system commonly implement when two inputs must be true to change the output?**

- A) OR operation
- B) AND operation
- C) XOR operation
- D) NOR operation

**Answer: B) AND operation**

**2017. What happens when an AND logic is implemented with two normally open (NO) contacts in series?**

- A) The output is energized when both contacts are closed
- B) The output is energized when either contact is closed
- C) The output is de-energized when both contacts are open
- D) The output is energized when one contact is closed

**Answer: A) The output is energized when both contacts are closed**

**2018. What is the function of a "NO" (normally open) contact in relay logic when it is used in a series configuration?**

- A) It allows current to flow only when the relay is not energized
- B) It blocks current flow when the relay is energized
- C) It allows current to flow only when the relay is energized
- D) It blocks current flow when the relay is not energized

**Answer: C) It allows current to flow only when the relay is energized**

**2019.** Which of the following logic operations can be implemented by connecting contacts in parallel?

A) AND operation

B) OR operation

C) NOT operation

D) NAND operation

Answer: B) OR operation

**2020.** What is the role of a holding contact (or seal-in contact) in a relay control system?

A) To prevent the relay from turning on

B) To maintain the relay's state after the coil is de-energized

C) To reset the relay

D) To supply power to the output device

Answer: B) To maintain the relay's state after the coil is de-energized

**2021.** Which of the following can be used to create a time delay in a relay logic circuit?

A) Latching relay

B) Timer relay

C) Push-button switch

D) Normally closed contact

Answer: B) Timer relay

**2022.** In a ladder diagram, how is a contact that opens when the relay is energized represented?

A) As a normally open contact

B) As a normally closed contact

C) As a push-button switch

D) As a transformer symbol

Answer: B) As a normally closed contact

**2023.** Which of the following is a disadvantage of using relay logic in complex control systems?

- A) It is simple and easy to understand
- B) It requires large amounts of wiring
- C) It is not flexible
- D) It provides high-speed control

Answer: B) It requires large amounts of wiring

**2024.** What is the common application of a relay logic system in an industrial environment?

- A) Process control systems
- B) Temperature monitoring systems
- C) Motor starter circuits
- D) Audio signal processing

Answer: C) Motor starter circuits

**2025.** What would happen if a relay coil is energized for too long?

- A) The relay coil will overheat and potentially fail
- B) The relay coil will increase in resistance
- C) The relay's contacts will become sticky
- D) The relay will automatically de-energize

Answer: A) The relay coil will overheat and potentially fail

**2026.** What happens when a relay coil is de-energized in a relay logic system?

- A) The relay switches to its energized state
- B) The contacts open or return to their default position
- C) The contacts close to maintain the current flow
- D) The relay maintains the current flow

Answer: B) The contacts open or return to their default position

**2027.** What is the characteristic of a mechanical relay?

- A) It operates with a steady state DC current
- B) It is only used in low voltage circuits
- C) It uses electromagnetic induction to open or close contacts

D) It requires no external power to operate

Answer: C) It uses electromagnetic induction to open or close contacts

**2028.** Which of the following best describes a relay's "contact life"?

A) The period during which the relay coil remains energized

B) The duration for which the relay contacts can perform their function without failure

C) The time delay introduced by the relay

D) The current that passes through the relay coil

Answer: B) The duration for which the relay contacts can perform their function without failure

**2029.** Which type of contact is used in a relay logic circuit to interrupt the current flow when the relay is de-energized?

A) Normally open contact

B) Normally closed contact

C) Momentary contact

D) Timed contact

Answer: B) Normally closed contact

**2030.** Which of the following is typically used to provide feedback in a relay logic control system?

A) Latching relay

B) Voltage regulator

C) Output contactors

D) Feedback loop via a normally open contact

Answer: D) Feedback loop via a normally open contact

**2031.** In relay logic, how is the NO (normally open) contact typically wired for an OR logic function?

A) In series

B) In parallel

C) In a feedback loop



D) In the ground path

Answer: B) In parallel

**2032.** What does a relay's "coil voltage" refer to?

A) The voltage used to power the relay's contacts

B) The voltage required to energize the relay coil

C) The voltage across the contacts when the relay is energized

D) The maximum voltage the relay can handle

Answer: B) The voltage required to energize the relay coil

**2033.** What is the characteristic of a latching relay in a relay logic system?

A) It switches on and off automatically

B) It keeps its state after the coil is de-energized

C) It has a short time delay before switching

D) It only operates in a series circuit

Answer: B) It keeps its state after the coil is de-energized

**2034.** What is the typical role of a normally closed contact in a relay logic circuit?

A) To allow current to flow when the relay is energized

B) To allow current to flow when the relay is de-energized

C) To block current when the relay is energized

D) To reverse the flow of current

Answer: B) To allow current to flow when the relay is de-energized

**2035.** In relay logic, how are multiple inputs to a relay typically connected to achieve an AND function?

A) All inputs are connected in parallel

B) All inputs are connected in series

C) One input is connected to the power source

D) One input is connected to the ground

Answer: B) All inputs are connected in series

**2036.** What type of output device is typically controlled by relay logic in a motor control system?

- A) Solenoid valve
- B) Variable frequency drive
- C) Electrical motor starter
- D) Stepper motor driver

Answer: C) Electrical motor starter

**2037.** Which of the following is an advantage of using relay logic in an industrial control system?

- A) High flexibility and scalability
- B) Simple to design and troubleshoot
- C) Can be easily reprogrammed without hardware changes
- D) Low cost and energy-efficient

Answer: B) Simple to design and troubleshoot

**2038.** Which of the following statements is true regarding the contacts of a relay in a control circuit?

- A) Normally closed contacts open when the relay coil is energized
- B) Normally open contacts close when the relay coil is de-energized
- C) Normally closed contacts close when the relay is energized
- D) Normally open contacts stay closed regardless of the relay state

Answer: A) Normally closed contacts open when the relay coil is energized

**2039.** In relay logic, what is the typical function of a timer relay?

- A) To control the voltage across the relay coil
- B) To delay the activation or deactivation of the relay for a specific time
- C) To limit the current flowing through the relay
- D) To amplify the signal to the relay coil

Answer: B) To delay the activation or deactivation of the relay for a specific time

**2040.** What is the effect of connecting two relay coils in parallel in a relay logic circuit?

- A) The relays will operate independently

B) The relays will act as a single relay

C) One relay will override the other

D) The circuit will short-circuit

Answer: B) The relays will act as a single relay

**2041.** In relay logic, which configuration is used to create an OR logic operation?

A) Two relays connected in series

B) Two relays connected in parallel

C) A relay connected with a feedback loop

D) A relay connected to a timer

Answer: B) Two relays connected in parallel

**2042.** Which type of relay is typically used when a specific condition needs to be held over a period of time even after the triggering input stops?

A) Time delay relay

B) Latching relay

C) Solid-state relay

D) Overcurrent relay

Answer: B) Latching relay

**2043.** What is the primary benefit of using relay logic for controlling machines in an industrial environment?

A) It is easy to change or reprogram

B) It provides an efficient way to store energy

C) It simplifies complex operations into discrete steps

D) It requires minimal wiring

Answer: C) It simplifies complex operations into discrete steps

**2044.** What is a common failure mode of mechanical relays in automatic control circuits?

A) Contact wear or pitting

B) Increased efficiency

C) Reduced input resistance

D) Higher switching speed

Answer: A) Contact wear or pitting

**2045.** What does a relay logic circuit often use to represent an input or condition?

A) A power supply

B) A normally open (NO) contact

C) A variable resistor

D) A capacitor

Answer: B) A normally open (NO) contact

**2046.** What type of logic operation is used when two relay contacts are connected in series in a ladder diagram?

A) AND logic

B) OR logic

C) NOT logic

D) XOR logic

Answer: A) AND logic

**2047.** Which of the following actions occurs when a relay contact is energized in a control system?

A) It increases the voltage to the output device

B) It changes the state of the output device, either on or off

C) It stores the output condition for later use

D) It amplifies the control signal to the output device

Answer: B) It changes the state of the output device, either on or off

**2048.** What is the purpose of a relay control diagram in industrial systems?

A) To show the physical layout of components

B) To represent the logical operation of control circuits

C) To show the wiring between different electrical components

D) To simulate the behavior of the control system under different conditions

Answer: B) To represent the logical operation of control circuits

**2049.** Which relay contact configuration is used for implementing a NOT logic function in a relay control circuit?

- A) Normally open contact
  - B) Normally closed contact
  - C) Series connected NO contacts
  - D) Parallel connected NC contacts
- Answer: B) Normally closed contact

**2050.** Which of the following is a limitation of using relay logic in control systems?

- A) High speed of operation
  - B) Complexity in handling large systems
  - C) Easy to implement in simple circuits
  - D) Flexibility in programming
- Answer: B) Complexity in handling large systems

**2051.** What would happen if an incorrect voltage is applied to the coil of a relay?

- A) The relay will operate as expected
  - B) The relay coil may burn out or fail to function
  - C) The relay will increase its switching speed
  - D) The relay's contacts will remain permanently closed
- Answer: B) The relay coil may burn out or fail to function

**2052.** In a relay logic circuit, what is the role of a "series" connection of contacts?

- A) It allows current flow when one of the contacts is closed
  - B) It interrupts current flow if any contact is open
  - C) It causes a time delay before switching
  - D) It generates a feedback signal for other relays
- Answer: B) It interrupts current flow if any contact is open

**2053.** Which of the following components is used to isolate the relay control circuit from the output circuit in a typical relay logic control system?

- A) Solid-state relay
- B) Timer relay

C) Contact relay

D) Contactor relay

Answer: A) Solid-state relay

**2054.** Which relay logic configuration is used to implement an AND logic operation in a circuit?

A) Contacts in series

B) Contacts in parallel

C) A feedback loop with a normally open contact

D) A feedback loop with a normally closed contact

Answer: A) Contacts in series

**2055.** What is one of the main benefits of using a relay for controlling motors in industrial settings?

A) The relay can directly control high voltage devices

B) The relay prevents electrical shock by isolating components

C) The relay can store operational data for later use

D) The relay can amplify weak signals to control the output devices

Answer: B) The relay prevents electrical shock by isolating components

**2056.** Which of the following is the correct sequence when a normally open relay contact is closed?

A) Current flows through the circuit and energizes the coil

B) The relay de-energizes, and the output device is turned off

C) The relay energizes, and the output device is turned on

D) The relay stays in its de-energized state

Answer: C) The relay energizes, and the output device is turned on

**2057.** What type of relay is used to switch high power devices while being controlled by a low power signal in a relay logic system?

A) Contact relay

B) Latching relay

C) Solid-state relay

D) Magnetic relay

Answer: C) Solid-state relay

**2058.** Which of the following components can serve as an input to a relay logic circuit?

A) A push-button switch

B) A mechanical relay

C) A power supply

D) A motor

Answer: A) A push-button switch

**2059.** In a relay logic control system, which type of device would most likely use a relay to control its operation?

A) Hydraulic pump

B) Electric motor

C) Fluid valve

D) Gas sensor

Answer: B) Electric motor

**2060.** What is the purpose of a "delayed" relay in a control circuit?

A) To provide a fixed delay before switching the output device

B) To amplify the current before sending it to the output device

C) To prevent feedback from reaching the relay

D) To allow instant switching without delay

Answer: A) To provide a fixed delay before switching the output device

**2061.** Which of the following is used in a relay logic system to prevent an output device from being energized prematurely?

A) Interlock relay

B) Timed relay

C) Latching relay

D) Push-button relay

Answer: A) Interlock relay

**2062.** What does a relay logic diagram typically represent?

- A) The physical location of electrical components
- B) The interconnection and function of electrical components in the control system
- C) The materials used in the electrical components
- D) The current flow between electrical components

Answer: B) The interconnection and function of electrical components in the control system

**2063.** In a relay logic system, how does a normally closed contact behave when the relay is energized?

- A) It remains open
- B) It remains closed
- C) It intermittently opens and closes
- D) It stops conducting current

Answer: A) It remains open

**2064.** What is the function of a relay logic “NO” contact when connected in parallel with other contacts?

- A) It creates a time delay
- B) It allows the circuit to complete when any one of the contacts closes
- C) It prevents current from flowing in the circuit
- D) It causes a short circuit

Answer: B) It allows the circuit to complete when any one of the contacts closes

**2065.** What is the purpose of using a holding contact (or seal-in contact) in a relay circuit?

- A) To delay the activation of the relay
- B) To keep the relay energized even after the trigger signal is removed
- C) To disconnect power from the relay coil
- D) To prevent the relay from being activated

Answer: B) To keep the relay energized even after the trigger signal is removed

**2066.** Which relay logic function is implemented by connecting multiple contacts in series?

- A) AND function



- B) OR function
- C) NOT function
- D) XOR function

Answer: A) AND function

**2067.** Which of the following statements is true about latching relays in a control system?

- A) They can only switch on and off once
- B) They keep their state after the control signal is removed
- C) They automatically reset themselves after activation
- D) They are used only for switching high currents

Answer: B) They keep their state after the control signal is removed

**2068.** What would be the result of connecting a relay contact in parallel with an input device like a switch in a relay control circuit?

- A) It will prevent the device from activating
- B) It will allow current to flow when either the switch or relay contact is closed
- C) It will isolate the device from the control circuit
- D) It will reduce the current flow to the device

Answer: B) It will allow current to flow when either the switch or relay contact is closed

**2069.** What type of relay is used to delay the activation or deactivation of the output device for a specific period?

- A) Time delay relay
- B) Solid-state relay
- C) Latching relay
- D) Contactor relay

Answer: A) Time delay relay

**2070.** How are normally open contacts arranged to create an AND logic operation in relay logic?

- A) Contacts are connected in parallel
- B) Contacts are connected in series
- C) Contacts are connected in feedback loops

D) Contacts are connected to the power supply

Answer: B) Contacts are connected in series

**2071.** In a relay logic circuit, which of the following can be used to prevent two relays from being energized at the same time?

A) Time delay relay

B) Interlock relay

C) Feedback relay

D) Series relay

Answer: B) Interlock relay

**2072.** What is a relay logic diagram commonly used for in an industrial control system?

A) To represent the physical layout of control panels

B) To show the logical operation of control circuits

C) To simulate the electrical components of the system

D) To monitor the electrical signal strength

Answer: B) To show the logical operation of control circuits

**2073.** What is a characteristic of a relay that is important for ensuring long-term operation in a control system?

A) High switching speed

B) Low energy consumption

C) High contact durability and reliability

D) Small physical size

Answer: C) High contact durability and reliability

**2074.** How can you create a feedback loop in a relay logic circuit?

A) By connecting a normally open contact to an output device

B) By connecting a normally closed contact to the relay coil

C) By connecting a normally open contact back to the input

D) By using a timer relay

Answer: C) By connecting a normally open contact back to the input

**2075.** What type of circuit operation occurs when two contacts are connected in parallel in a relay logic diagram?

A) A logical AND operation

B) A logical OR operation

C) A logical NOT operation

D) A logical NOR operation

Answer: B) A logical OR operation

**2076.** What is the typical application of relay logic in control systems?

A) High-speed data processing

B) Simple on/off control of machines and devices

C) Direct control of complex computer systems

D) Monitoring temperature and humidity levels

Answer: B) Simple on/off control of machines and devices

**2077.** What happens when a relay coil is de-energized in a relay logic circuit?

A) The relay will remain energized until a reset occurs

B) The contacts return to their default (normally open or normally closed) state

C) The relay will short-circuit the output

D) The relay will energize immediately

Answer: B) The contacts return to their default (normally open or normally closed) state

**2078.** What is the function of a contact relay in a control system?

A) To control the power supply to the relay coil

B) To make or break a circuit depending on the relay's state

C) To delay the operation of the relay

D) To amplify the signal to the output device

Answer: B) To make or break a circuit depending on the relay's state

**2079.** Which relay type can be used for switching high-current devices while being controlled by a low-voltage signal?

A) Contactor relay

B) Solid-state relay

C) Latching relay

D) Time delay relay

Answer: A) Contactor relay

**2080.** What occurs when a normally closed contact in a relay is in a series configuration and the relay is energized?

A) The current flow is blocked

B) The current flow is allowed

C) The current flow is interrupted after a delay

D) The relay coil is powered off

Answer: A) The current flow is blocked

**2081.** In a relay logic system, how are contacts typically drawn in a ladder diagram?

A) As a series of switches with lines between them

B) As circles with inputs and outputs inside

C) As parallel lines with electrical symbols

D) As a combination of lines and symbols representing logic

Answer: D) As a combination of lines and symbols representing logic

**2082.** Which of the following is an example of a control device that might be used with relay logic to actuate mechanical actions?

A) A light sensor

B) A solenoid valve

C) A variable frequency drive

D) A digital counter

Answer: B) A solenoid valve

**2083.** What type of contact is used to create an AND logic operation in a relay circuit?

- A) Normally open contacts in parallel
- B) Normally closed contacts in parallel
- C) Normally open contacts in series
- D) Normally closed contacts in series

Answer: C) Normally open contacts in series

**2084.** What is the main disadvantage of using relay logic in highly complex control systems?

- A) It is too easy to program and modify
- B) It requires a lot of wiring and physical space
- C) It uses only digital signals
- D) It can be easily integrated with computers

Answer: B) It requires a lot of wiring and physical space

**2085.** What is the role of a time delay in a relay logic system?

- A) To synchronize the operation of multiple relays
- B) To ensure that the relay is turned off after a preset time
- C) To activate the relay immediately when the signal is received
- D) To prevent electrical faults from occurring during relay switching

Answer: B) To ensure that the relay is turned off after a preset time

**2086.** Which of the following is a characteristic of a solid-state relay compared to mechanical relays?

- A) It has no moving parts
- B) It is slower to respond
- C) It consumes more power
- D) It is only used for high-power circuits

Answer: A) It has no moving parts

**2087.** In relay logic, what happens when two relays are connected in series?

- A) The relays will operate independently
- B) The circuit will be completed only if both relays are energized
- C) The circuit will be completed even if one relay is not energized
- D) The relays will energize simultaneously

Answer: B) The circuit will be completed only if both relays are energized

**2088.** . What is the primary purpose of an interlock in relay logic control circuits?

- A) To delay the operation of the relay
- B) To prevent two devices from operating at the same time
- C) To store the relay's output condition
- D) To amplify the control signal

Answer: B) To prevent two devices from operating at the same time

**2089.** In a relay logic diagram, what does a normally closed contact represent?

- A) The contact is open when the relay is energized
- B) The contact is closed when the relay is energized
- C) The contact is always open
- D) The contact is always closed

Answer: B) The contact is closed when the relay is energized

**2090.** In relay logic, which of the following is used to provide a feedback signal to a relay coil to maintain its energized state?

- A) Timer relay
- B) Holding contact
- C) Latching relay
- D) Solid-state relay

Answer: B) Holding contact

**2091.** . Which of the following relay types is most commonly used to switch on large industrial equipment?

- A) Timer relay
  - B) Contactor relay
  - C) Latching relay
  - D) Mechanical relay
- Answer: B) Contactor relay

**2092.** What is the primary function of a relay in an automatic control system?

- A) To store data for analysis
  - B) To switch electrical circuits on or off based on inputs
  - C) To measure the output voltage
  - D) To act as a transformer
- Answer: B) To switch electrical circuits on or off based on inputs

**2093.** What is the role of a time delay relay in a control system?

- A) To energize the relay immediately after receiving the control signal
  - B) To delay the operation of the output device after the input signal is received
  - C) To control the current through the relay coil
  - D) To store the operational state of the relay
- Answer: B) To delay the operation of the output device after the input signal is received

**2094.** In relay logic, which configuration is used to implement an OR logic operation?

- A) Contacts in series
  - B) Contacts in parallel
  - C) Contacts with a time delay
  - D) Contacts with a feedback loop
- Answer: B) Contacts in parallel

**2095.** What happens when a relay coil is energized in a relay logic circuit?

- A) The relay contacts open
- B) The relay contacts close or change state
- C) The relay coils stop drawing current
- D) The relay enters a feedback loop

Answer: B) The relay contacts close or change state

**2096.** Which type of relay logic configuration would you use to ensure that an output device is activated only when multiple conditions are true?

- A) Series contact configuration
- B) Parallel contact configuration
- C) Normally open contact configuration
- D) Normally closed contact configuration

Answer: A) Series contact configuration

**2097.** What is the function of a latching relay in a control system?

- A) To store the state of the relay even after the input signal is removed
- B) To delay the operation of the relay
- C) To amplify the control signal to the output device
- D) To provide a constant voltage to the relay circuit

Answer: A) To store the state of the relay even after the input signal is removed

**2098.** Which relay logic configuration is used to implement a NOT logic function?

- A) Normally open contacts in series
- B) Normally closed contacts in parallel
- C) Normally closed contacts in series
- D) Normally open contacts in parallel

Answer: C) Normally closed contacts in series



**2099.** How can a relay logic circuit be reset?

- A) By de-energizing the relay coil
- B) By applying a higher voltage to the relay coil
- C) By manually opening a contact
- D) By applying a feedback signal

Answer: A) By de-energizing the relay coil

**2100.** What does an interlock prevent in a relay logic system?

- A) The relay from being activated at the wrong time
- B) The relay from storing data
- C) The circuit from energizing
- D) The relay from connecting to the power supply

Answer: A) The relay from being activated at the wrong time

**2101.** What type of relay is used to switch heavy loads with a low-power signal in industrial applications?

- A) Contactor relay
- B) Latching relay
- C) Time delay relay
- D) Magnetic relay

Answer: A) Contactor relay

**2102.** Which of the following types of relays is designed to hold its position after being activated, even when the input signal is removed?

- A) Latching relay
- B) Mechanical relay
- C) Time delay relay
- D) Contactor relay

Answer: A) Latching relay

**2103.** What type of circuit configuration would you use in relay logic to implement a simple ON/OFF switch for a motor?

- A) AND logic
  - B) OR logic
  - C) Not logic
  - D) Simple series contact configuration
- Answer: D) Simple series contact configuration

**2104.** In relay logic, what would be the effect of adding a normally open (NO) contact in series with a relay coil?

- A) The relay will always stay off
  - B) The relay will activate only if the NO contact is closed
  - C) The relay will continuously energize
  - D) The relay will be inactivated when the NO contact is closed
- Answer: B) The relay will activate only if the NO contact is closed

**2105.** Which of the following is a disadvantage of mechanical relays in an automatic control system?

- A) They are too fast to operate
  - B) They can wear out over time due to mechanical parts
  - C) They require very little energy to operate
  - D) They have no contact bouncing issues
- Answer: B) They can wear out over time due to mechanical parts

**2106.** In a relay logic circuit, how can a contact relay be used to control the operation of a motor?

- A) By using the relay as a power amplifier for the motor
  - B) By using the relay contacts to turn the motor on or off based on input conditions
  - C) By using the relay to store the motor's operational data
  - D) By using the relay to control the motor's speed
- Answer: B) By using the relay contacts to turn the motor on or off based on input conditions

**2107.** Which of the following is a common characteristic of a relay logic control system in industrial applications?

- A) It uses complex programming languages
- B) It requires a central processing unit (CPU) for operation
- C) It operates using discrete on/off logic
- D) It requires very little wiring for installation

Answer: C) It operates using discrete on/off logic

**2108.** Which relay contact configuration is commonly used in relay logic systems to implement a series or parallel combination?

- A) Normally open (NO) contacts
- B) Normally closed (NC) contacts
- C) Normally open (NO) contacts in series or parallel
- D) Normally closed (NC) contacts in series or parallel

Answer: C) Normally open (NO) contacts in series or parallel

**2109.** What happens to the relay when the power supply to the control circuit is disconnected?

- A) The relay stays in its last energized state
- B) The relay will reset to its default state
- C) The relay contacts will remain closed
- D) The relay will continue to function normally

Answer: B) The relay will reset to its default state

**2110.** How does a time delay relay differ from a standard relay in terms of operation?

- A) It has a built-in timing function that delays activation or deactivation
- B) It is faster to activate than a standard relay
- C) It stores the last output condition
- D) It directly controls the voltage to the coil

Answer: A) It has a built-in timing function that delays activation or deactivation

**2111.** Which of the following components is typically used in a relay logic control system to isolate different sections of the control circuit?

- A) A transformer
- B) A feedback loop
- C) A solid-state relay
- D) A contactor

Answer: C) A solid-state relay

**2112.** In relay logic, what is the function of a contact that is part of a feedback loop?

- A) To delay the deactivation of the relay
- B) To keep the relay activated after the input is removed
- C) To prevent any further relay operation
- D) To increase the speed of relay switching

Answer: B) To keep the relay activated after the input is removed

**2113.** What type of relay is used to prevent damage to electrical circuits by limiting the current in the circuit?

- A) Time delay relay
- B) Overload relay
- C) Latching relay
- D) Contactor relay

Answer: B) Overload relay

**2114.** What is the primary purpose of a normally open (NO) relay contact in a relay logic control system?

- A) To allow current flow when the relay is de-energized
- B) To break the circuit when the relay is energized
- C) To allow current flow when the relay is energized
- D) To prevent any current flow in the circuit

Answer: C) To allow current flow when the relay is energized

**2115.** What is a common disadvantage of using mechanical relays in control circuits?

- A) High energy consumption
- B) Slow switching speeds
- C) Inability to handle high currents
- D) High cost

Answer: B) Slow switching speeds

**2116.** Which of the following types of relays is suitable for switching low voltage DC circuits?

- A) Contactor relay
- B) Latching relay
- C) Solid-state relay
- D) Overload relay

Answer: C) Solid-state relay

**2117.** Which of the following relay types is most appropriate for controlling the switching of electrical motors in a factory setting?

- A) Latching relay
- B) Mechanical relay
- C) Contactor relay
- D) Solid-state relay

Answer: C) Contactor relay

**2118.** What does a relay's contact change state when the relay is energized?

- A) From normally closed to normally open
- B) From normally open to normally closed
- C) It stays in its original state
- D) It causes a short circuit

Answer: A) From normally closed to normally open

**2119.** In a relay logic circuit, what is the main function of a contact that is wired in series with the relay coil?

- A) To delay the relay's operation
- B) To interrupt current flow and de-energize the relay
- C) To allow current flow when the relay is not energized
- D) To indicate the status of the relay

Answer: B) To interrupt current flow and de-energize the relay

**2120.** What is the primary purpose of a normally closed (NC) contact in relay logic?

- A) To prevent current flow when the relay is energized
- B) To allow current flow when the relay is energized
- C) To delay the activation of the relay
- D) To amplify the control signal

Answer: A) To prevent current flow when the relay is energized

**2121.** How can a relay logic circuit be used to create an AND function?

- A) By connecting contacts in parallel
- B) By connecting contacts in series
- C) By adding a time delay element
- D) By using a feedback loop

Answer: B) By connecting contacts in series

**2122.** Which of the following relay types would be used to hold a relay in its activated state after the control signal has been removed?

- A) Time delay relay
- B) Latching relay
- C) Mechanical relay
- D) Contactor relay

Answer: B) Latching relay

**2123.** What would be the result of connecting a relay contact in parallel with a switch in a relay logic circuit?

- A) The switch will always override the relay
- B) The circuit will be completed when either the switch or relay contact is closed
- C) The switch will remain open
- D) The relay will control the switch instead

Answer: B) The circuit will be completed when either the switch or relay contact is closed

**2124.** Which of the following devices would most likely require relay logic control?

- A) A microcontroller
- B) A simple light switch
- C) A large electric motor
- D) A transistor

Answer: C) A large electric motor

**2125.** What happens when multiple normally open (NO) contacts are connected in series in a relay logic circuit?

- A) The circuit will be completed only if all NO contacts are closed
- B) The circuit will be completed if any NO contact is closed
- C) The relay will remain in a constant energized state
- D) The NO contacts will create a feedback loop

Answer: A) The circuit will be completed only if all NO contacts are closed

**2126.** In a relay logic control system, what is the typical role of a time delay relay?

- A) To control the duration of signal transmission
- B) To prevent an immediate relay activation or deactivation
- C) To switch between different operating modes
- D) To amplify the control signal

Answer: B) To prevent an immediate relay activation or deactivation

**2127.** Which of the following statements best describes a relay logic ladder diagram?

- A) It shows the physical placement of relays in the control panel
- B) It represents the flow of electrical current in the system
- C) It is a graphical representation of control logic used in relay systems
- D) It is a program written in assembly language

Answer: C) It is a graphical representation of control logic used in relay systems

**2128.** . How is a normally closed (NC) contact used in a relay logic circuit?

- A) To allow current to pass only when the relay is energized
- B) To break the circuit when the relay is energized
- C) To store the relay's operational state
- D) To reduce the electrical load on the circuit

Answer: B) To break the circuit when the relay is energized

**2129.** What is a contact relay commonly used for in industrial automation?

- A) To store energy
- B) To monitor system voltage
- C) To switch on/off machines and electrical components
- D) To measure temperature and humidity

Answer: C) To switch on/off machines and electrical components

**2130.** What is an interlocking relay used for in a control system?

- A) To switch the relay coil on and off
- B) To prevent conflicting operations by controlling the sequence of relays
- C) To measure electrical currents in the circuit
- D) To amplify the control signal

Answer: B) To prevent conflicting operations by controlling the sequence of relays



**2131.** What is the function of a holding contact in a relay logic system?

- A) To delay the relay's operation
- B) To keep the relay activated once the control signal is removed
- C) To increase the relay's response time
- D) To prevent the relay from being deactivated

Answer: B) To keep the relay activated once the control signal is removed

**2132.** What is the primary advantage of using relay logic in industrial control systems?

- A) It reduces the need for complex programming
- B) It is suitable for high-speed digital operations
- C) It is inexpensive and easy to wire
- D) It can directly control analog signals

Answer: C) It is inexpensive and easy to wire

**2133.** What happens when two relays are connected in parallel in a relay logic system?

- A) The relays will activate only when both are energized
- B) The relays will activate if either relay is energized
- C) The relays will always be in the de-energized state
- D) The relays will cancel each other's activation

Answer: B) The relays will activate if either relay is energized

**2134.** What is the main difference between a time delay relay and a standard relay?

- A) A time delay relay has a built-in timing function
- B) A standard relay can delay activation
- C) A time delay relay can only switch on once
- D) A standard relay has no moving parts

Answer: A) A time delay relay has a built-in timing function

**2135.** In a relay logic circuit, what is the purpose of an auxiliary contact?

- A) To perform the primary function of the relay
- B) To enhance the control circuit by providing additional switching options
- C) To store data about the relay's operation
- D) To prevent short circuits in the relay coil

Answer: B) To enhance the control circuit by providing additional switching options

**2136.** Which of the following types of relays is most commonly used in a ladder diagram to control motor circuits?

- A) Solid-state relay
- B) Contactor relay
- C) Latching relay
- D) Overload relay

Answer: B) Contactor relay

**2137.** How is a relay logic system typically reset after it has been de-energized?

- A) By using an external reset switch or signal
- B) Automatically when the control signal is re-applied
- C) By manually adjusting the relay's internal components
- D) By applying a feedback signal to the coil

Answer: A) By using an external reset switch or signal

**2138.** Which of the following is a common application of relay logic in industrial control systems?

- A) Controlling the on/off states of motors
- B) Processing sensor data in real-time
- C) Managing complex automation programming
- D) Storing operational history in a database

Answer: A) Controlling the on/off states of motors

**2139.** What is the main advantage of using parallel relay contacts in a control circuit?

- A) It provides redundancy to ensure the circuit is completed
- B) It limits the current flow in the circuit
- C) It decreases the speed of the relay operation
- D) It simplifies the wiring of the circuit

Answer: A) It provides redundancy to ensure the circuit is completed

**2140.** What will happen if an overload relay trips in a control circuit?

- A) The relay will activate another control system
- B) The circuit will be de-energized to protect the equipment from damage
- C) The relay will store the overload condition for later reference
- D) The relay will continue to operate at a lower speed

Answer: B) The circuit will be de-energized to protect the equipment from damage

**2141.** In a relay logic system, how is a feedback loop created?

- A) By connecting a relay contact to the input of the control circuit
- B) By using a normally open contact in parallel with the relay coil
- C) By directly linking the output to the input
- D) By adding a time delay relay in the control system

Answer: A) By connecting a relay contact to the input of the control circuit

**2142.** Which of the following relay types is best suited for controlling high-power electrical devices with low control signals?

- A) Latching relay
- B) Contactor relay
- C) Solid-state relay
- D) Mechanical relay

Answer: B) Contactor relay

**2143.** In a relay logic system, what does an "OR" logic operation typically require?

- A) Two contacts in series
- B) Two contacts in parallel
- C) One normally open contact
- D) One normally closed contact

Answer: B) Two contacts in parallel

**2144.** What is the function of an overload relay in a motor control system?

- A) To limit the motor speed
- B) To prevent the motor from starting
- C) To protect the motor from damage by disconnecting power during an overload
- D) To provide feedback to the motor control system

Answer: C) To protect the motor from damage by disconnecting power during an overload

**2145.** Which relay type would be used to ensure that a system remains in its last state after the control signal has been removed?

- A) Time delay relay
- B) Contactor relay
- C) Latching relay
- D) Solid-state relay

Answer: C) Latching relay

**2146.** What is the purpose of an auxiliary relay in a relay logic control system?

- A) To control power to the main load
- B) To help in the switching of high-power devices
- C) To control low-power auxiliary operations and provide control feedback
- D) To store data for later use

Answer: C) To control low-power auxiliary operations and provide control feedback

**2147.** How are relay logic systems typically used in automotive applications?

- A) To control ignition timing
- B) To switch power to lights, motors, and other components
- C) To provide advanced navigation systems
- D) To monitor engine fuel efficiency

Answer: B) To switch power to lights, motors, and other components

**2148.** What happens when a relay in a circuit has a "coil" with a rated voltage applied to it?

- A) The relay opens its contacts
- B) The relay closes its contacts
- C) The contacts remain in their original state
- D) The relay emits an audible sound

Answer: B) The relay closes its contacts

**2149.** What type of relay is used to control the switching sequence in a system with multiple relays?

- A) Overload relay
- B) Latching relay
- C) Sequencing relay
- D) Contact relay

Answer: C) Sequencing relay

**2150.** In relay logic, what does an AND logic function require?

- A) All connected relay contacts in series
- B) All connected relay contacts in parallel
- C) At least one normally closed relay contact
- D) At least one normally open relay contact

Answer: A) All connected relay contacts in series

**2151.** Which of the following relays is used to maintain the circuit in a state after the control signal is removed?

A) Contactor relay

B) Latching relay

C) Thermal relay

D) Time delay relay

Answer: B) Latching relay

**2152.** What is the typical role of a normally open (NO) contact in a relay logic control system?

A) To open the circuit when the relay is energized

B) To complete the circuit when the relay is energized

C) To interrupt the relay's coil current

D) To prevent a short circuit

Answer: B) To complete the circuit when the relay is energized

**2153.** What is the main purpose of using a "holding contact" in relay logic systems?

A) To delay the relay operation

B) To hold the relay in the energized state once activated

C) To break the circuit during operation

D) To prevent relay coil burnout

Answer: B) To hold the relay in the energized state once activated

**2154.** How is a feedback loop created in a relay logic control system?

A) By connecting a relay contact to the input of the control circuit

B) By adding a time delay relay in the control system

C) By using parallel contacts

D) By adding an overload protection system

Answer: A) By connecting a relay contact to the input of the control circuit

**2155.** Which of the following is NOT a feature of a time delay relay in relay logic?

- A) Delays the opening or closing of contacts
- B) Allows for a delay before switching the control signal
- C) Immediately reacts to control signals
- D) Controls actions based on a preset time interval

Answer: C) Immediately reacts to control signals

**2156.** What happens when multiple normally closed (NC) contacts are connected in series in a relay logic system?

- A) The circuit will be completed only if all NC contacts are closed
- B) The circuit will remain open unless one NC contact is closed
- C) The circuit will be completed when any NC contact is open
- D) The circuit will be bypassed when one NC contact opens

Answer: A) The circuit will be completed only if all NC contacts are closed

**2157.** What is the main function of a contact relay in industrial automation?

- A) To measure current levels
- B) To switch on/off electrical devices in response to control signals
- C) To store control information
- D) To filter noise from control signals

Answer: B) To switch on/off electrical devices in response to control signals

**2158.** In a relay logic system, what is an auxiliary relay used for?

- A) To control the primary load
- B) To provide additional switching options and functionality
- C) To prevent overload in the relay circuit
- D) To filter out unnecessary control signals

Answer: B) To provide additional switching options and functionality

**2159.** What is the function of a mechanical relay in a relay logic circuit?

- A) To process control signals
- B) To open and close the electrical contacts for switching purposes
- C) To measure the voltage levels in the circuit
- D) To amplify signals to control high-power equipment

Answer: B) To open and close the electrical contacts for switching purposes

**2160.** How is a "latching" relay different from a standard relay?

- A) It does not require external power to maintain its state
- B) It operates at a higher current rating
- C) It can store data permanently
- D) It is faster than a standard relay

Answer: A) It does not require external power to maintain its state

**2161.** What is the function of an overload relay in a motor control system?

- A) To automatically reset the motor after it shuts down
- B) To prevent excessive current by disconnecting the circuit when the motor is overloaded
- C) To control the motor's speed
- D) To amplify the motor's starting torque

Answer: B) To prevent excessive current by disconnecting the circuit when the motor is overloaded

**2162.** What is the result of connecting two relays in series in a relay logic system?

- A) The circuit is completed only if both relays are activated
- B) The circuit is completed if either relay is activated
- C) The relays will cancel each other's operation
- D) Both relays will be deactivated automatically

Answer: A) The circuit is completed only if both relays are activated



**2163.** Which of the following relay types can be used to control the operation of motors and large electrical loads?

- A) Solid-state relay
- B) Contactor relay
- C) Thermal relay
- D) Time delay relay

Answer: B) Contactor relay

**2164.** Which relay configuration is typically used to create an OR logic function in a relay logic control system?

- A) Relays connected in parallel
- B) Relays connected in series
- C) Relays with latching contacts
- D) Relays with a holding circuit

Answer: A) Relays connected in parallel

**2165.** What does a "time delay" relay do in a control system?

- A) It immediately switches the output
- B) It switches the output after a predetermined delay
- C) It amplifies the input signal
- D) It changes the relay's coil resistance

Answer: B) It switches the output after a predetermined delay

**2166.** In a relay logic circuit, how is an "AND" function achieved?

- A) By connecting the contacts in parallel
- B) By connecting the contacts in series
- C) By using an overload relay
- D) By using an auxiliary relay

Answer: B) By connecting the contacts in series

**2167.** Which of the following best describes the purpose of a normally closed (NC) contact in relay logic?

- A) It is used to interrupt the flow of current when the relay is energized
- B) It allows current flow when the relay is energized
- C) It stores a time delay
- D) It amplifies the current in the control circuit

Answer: A) It is used to interrupt the flow of current when the relay is energized

**2168.** What is the key function of a "hold-in" contact in a relay logic system?

- A) To extend the relay's operation after the control signal is removed
- B) To activate the relay during normal operation
- C) To reset the relay after deactivation
- D) To reduce the relay's power consumption

Answer: A) To extend the relay's operation after the control signal is removed

**2169.** What would be the outcome if two relays are connected in parallel with NO contacts?

- A) The circuit will be completed when both relays are energized
- B) The circuit will be completed when either relay is energized
- C) The relays will act in a sequential manner
- D) The circuit will remain open until all relays are energized

Answer: B) The circuit will be completed when either relay is energized

**2170.** What role does a contact relay play in controlling machinery in industrial automation?

- A) It stores operational parameters
- B) It provides redundancy for power systems
- C) It switches power on/off to various components of the machinery
- D) It filters noise from electrical signals

Answer: C) It switches power on/off to various components of the machinery

**2171.** What is the role of a normally open (NO) contact when used in a series circuit for relay logic?

- A) It allows current to pass only when the relay is de-energized
- B) It prevents current from flowing when the relay is de-energized
- C) It completes the circuit when the relay is energized
- D) It creates a short circuit

Answer: C) It completes the circuit when the relay is energized

**2172.** What type of relay would be used in applications requiring the switching of high-current loads?

- A) Time delay relay
- B) Contactor relay
- C) Latching relay
- D) Solid-state relay

Answer: B) Contactor relay

**2173.** How does a relay logic system improve system reliability in an industrial control application?

- A) By providing programmable control options
- B) By using mechanical components that fail less often
- C) By offering high-speed digital control
- D) By creating redundant switching paths and protective functions

Answer: D) By creating redundant switching paths and protective functions

**2174.** Which type of relay is often used to delay the response of a system to a control signal?

- A) Time delay relay
- B) Contactor relay
- C) Latching relay
- D) Mechanical relay

Answer: A) Time delay relay

**2175.** What is the purpose of a feedback contact in a relay logic system?

- A) To provide a delay in the control signal
- B) To help maintain or modify the control signal flow
- C) To prevent the relay from operating
- D) To monitor system performance

Answer: B) To help maintain or modify the control signal flow

**2176.** In relay logic, what does an OR logic function accomplish?

- A) It requires both conditions to be true for the output to occur
- B) It occurs when either of the conditions is true
- C) It delays the output until both conditions are false
- D) It resets the control system

Answer: B) It occurs when either of the conditions is true

**2177.** What happens if a relay's contacts are damaged or worn out in a control system?

- A) The relay will continue operating normally
- B) The system will stop functioning as designed, causing a failure
- C) The relay will store operational history
- D) The relay will automatically repair itself

Answer: B) The system will stop functioning as designed, causing a failure

**2178.** What is the function of a contact in a relay circuit?

- A) To measure current in the circuit
- B) To store data for future use
- C) To connect or disconnect the control circuit
- D) To amplify the control signal

Answer: C) To connect or disconnect the control circuit

**2179.** What happens when two normally open (NO) relay contacts are connected in series?

- A) The circuit is completed when either contact is closed
- B) The circuit is completed when both contacts are closed

C) The circuit is interrupted when both contacts are closed

D) The relay will not function

Answer: B) The circuit is completed when both contacts are closed

**2180.** In a relay logic system, what does a normally closed (NC) contact do when the relay is energized?

A) It closes the circuit

B) It opens the circuit

C) It allows current to flow continuously

D) It stores control data

Answer: B) It opens the circuit

**2181.** What is the primary purpose of a time delay relay?

A) To store energy

B) To delay the switching of a circuit by a preset time interval

C) To measure current levels in the circuit

D) To monitor system faults

Answer: B) To delay the switching of a circuit by a preset time interval

**2182.** Which relay function is used to automatically reset a system after a fault is cleared?

A) Latching relay

B) Contactor relay

C) Time delay relay

D) Reset relay

Answer: D) Reset relay

**2183.** Which of the following is an example of a control action enabled by relay logic?

A) Opening a valve after a certain time delay

B) Regulating the temperature of a furnace

C) Filtering signals from sensors

D) Adjusting the power supply voltage

Answer: A) Opening a valve after a certain time delay

**2184.** Which relay type is used to protect a motor from overcurrent conditions?

- A) Contactor relay
- B) Overload relay
- C) Time delay relay
- D) Latching relay

Answer: B) Overload relay

**2185.** Which relay configuration is used to achieve an AND logic function in relay control circuits?

- A) Series configuration of contacts
- B) Parallel configuration of contacts
- C) Use of time delay relays
- D) Use of latching relays

Answer: A) Series configuration of contacts

**2186.** What type of relay is typically used to switch heavy electrical loads such as motors?

- A) Solid-state relay
- B) Time delay relay
- C) Contactor relay
- D) Latching relay

Answer: C) Contactor relay

**2187.** What is a characteristic of a latching relay?

- A) It requires continuous power to remain in a certain state
- B) It holds its state even after power is removed
- C) It provides a time delay before switching
- D) It switches the circuit only once

Answer: B) It holds its state even after power is removed

**c) Thyristor Control :**

**2188. 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**

**2189. 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**

**2190. 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**

**2191. Which of the following is a three-terminal device?**

- A) Diode
- B) SCR
- C) MOSFET
- D) Triac

**Correct: B**

**2192. 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**

**2193. 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**

**2194. Gate triggering current is generally:**

- A) AC current
- B) High-frequency current
- C) Low-magnitude DC current
- D) Very high-magnitude current

**Correct: C**

**2195. 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**

**2196. The typical on-state voltage drop across an SCR is:**

- A) 0.1V
- B) 1V to 2V
- C) 10V

D) 5V

**Correct: B**

**2197. 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**

**2198. Which is not a method of triggering an SCR?**

- A) Thermal triggering
- B) Light triggering
- C) Gate triggering
- D) Magnetic triggering

**Correct: D**

**2199. Natural commutation occurs in:**

- A) DC circuits
- B) AC circuits
- C) Choppers
- D) Inverters

**Correct: B**

**2200. 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**

**2201. Which method of commutation is used in HVDC transmission?**

- A) Natural commutation
- B) Forced commutation
- C) Line commutation
- D) Voltage commutation

**Correct: B**

**2202. 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**

**2203. A full-wave rectifier using thyristors is also known as:**

- A) Uncontrolled rectifier
- B) Controlled bridge rectifier
- C) Half converter
- D) Chopper

**Correct: B**

**2204. 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**

**2205. In a single-phase full converter, how many SCRs are used?**

A) 1

B) 2

C) 4

D) 6

**Correct: C**

**2206. 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**

**2207. 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**

**2208. 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**

**2209. A typical snubber circuit includes:**

A) Diode only

B) Resistor and inductor

C) Resistor and capacitor

D) Capacitor and diode

**Correct: C**

**2210. 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**

**2211. SCRs are protected from overcurrent using:**

A) RC snubber

B) Series fuse

C) Zener diode

D) Filter capacitor

**Correct: B**

**2212. 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**

**2213. Choppers convert:**

A) AC to DC

B) DC to AC

C) Fixed DC to variable DC

D) DC to constant voltage

**Correct: C**

**2214. 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**

**2215. 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**

**2216. Which type of thyristor is used in high-frequency inverter circuits?**

A) SCR

B) TRIAC

C) GTO

D) DIAC

**Correct: C**

**2217. The main challenge in thyristor-based inverters is:**

A) Size

B) Weight

C) Commutation

D) Input voltage

**Correct: C**

**2218. Thyristors are primarily used in:**

A) Signal processing

B) Power control

C) Data storage

D) Communication circuits

**Correct: B**

**2219. A TRIAC is a:**

A) Bidirectional SCR

B) Unidirectional diode

C) Type of transistor

D) DC chopper

**Correct: A**

**2220. The gate terminal of SCR is used to:**

A) Block current

B) Cool the device

C) Initiate conduction

D) Measure voltage

**Correct: C**

**2221. 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**

**2222. Which component can turn off a thyristor without external commutation?**

- A) TRIAC
- B) GTO
- C) DIAC
- D) SCR

**Correct: B**

**2223.  $dv/dt$  protection prevents:**

- A) False turn-off
- B) False turn-on
- C) Excessive power loss
- D) Gate noise

**Correct: B**

**2224. Which device is not suitable for bidirectional control?**

- A) TRIAC
- B) DIAC
- C) SCR
- D) MOSFET

**Correct: C**

**2225. 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**

**2226. In thyristor terminology, “GTO” stands for:**

- A) Gate-Turn-Off
- B) Gate-Time-On
- C) General Turn-Off
- D) Gate-Triggered Oscillator

**Correct: A**

**2227. Which device helps in turning ON the TRIAC?**

- A) MOSFET
- B) DIAC
- C) IGBT
- D) BJT

**Correct: B**

**2228. 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**

**2229. Which of the following is a two-terminal bidirectional device?**

A) SCR

B) DIAC

C) TRIAC

D) GTO

**Correct: B**

**2230. 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**

**2231. Which parameter limits the rate of rise of anode current?**

A)  $dv/dt$

B)  $di/dt$

C) Holding current

D) Latching current

**Correct: B**

**2232. 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**

**2233. A DIAC is mainly used as a:**

A) Trigger device for TRIAC

B) High power rectifier

C) Voltage regulator

D) Frequency modulator

**Correct: A**

**2234. Which of the following devices has four layers of P and N type material?**

A) Diode

B) BJT

C) SCR

D) MOSFET

**Correct: C**

**2235. 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**

**2236. 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**

**2237. Which device can conduct current in both directions when triggered?**

A) SCR

B) TRIAC

C) GTO

D) Diode

**Correct: B**

**2238. 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**

**2239. Thyristor acts as a:**

A) Voltage controlled switch

B) Current controlled switch

C) Gate controlled rectifier

D) Light controlled amplifier

**Correct: C**

**2240. 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**

**2241. The gate of SCR is always connected to:**

A) Cathode

B) Anode

C) Positive terminal

D) Negative terminal

**Correct: A**

**2242. Which of these is a bidirectional device?**

A) SCR

B) TRIAC

C) GTO

D) UJT

**Correct: B**

**2243. 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**

**2244. 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**

**2245. SCR is made of how many layers of semiconductor material?**

A) 2

B) 3

C) 4

D) 5

**Correct: C**

**2246. The DIAC is used primarily to:**

A) Trigger a TRIAC

B) Filter DC supply

C) Rectify AC

D) Reduce frequency

**Correct: A**

**2247. The device which can be turned ON and OFF using gate signals is:**

A) SCR

B) TRIAC

C) GTO

D) DIAC

**Correct: C**

**2248. 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**

**2249. Thyristors are mainly used in:**

A) Audio amplifiers

B) Low power circuits

C) Digital memory

D) Power electronics

**Correct: D**

**2250. 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**

**2251. Which of the following is used to commutate a thyristor in a chopper circuit?**

A) Resistor

B) Capacitor

C) Inductor

D) Diode

**Correct: B**

**2252. Class D commutation is also known as:**

A) Load commutation

B) Resonant commutation

C) Auxiliary commutation

D) Voltage commutation

**Correct: C**

**2253. In Class A commutation, the commutation is achieved by:**

A) AC supply

B) External supply

C) Load current itself

D) Gate signal

**Correct: C**

**2254. 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**

**2255. 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**

**2256. In an SCR, reverse recovery time is important for:**

A) Commutation

B) Triggering

C) Holding

D) Latching

**Correct: A**

**2257. 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**

**2258. 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**

**2259. Which device is most commonly used for AC voltage control in fan regulators?**

A) SCR

B) MOSFET

C) TRIAC

D) BJT

**Correct: C**

**2260. TRIACs are suitable for:**

A) DC-only loads

B) AC-only loads

C) High-frequency loads

D) Battery chargers

**Correct: B**

**2261. SCRs are preferred in power control because of:**

A) High switching speed

B) High gain

C) High efficiency

D) High frequency

**Correct: C**

**2262. 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**

**2263. UJT is used in thyristor circuits mainly for:**

A) Amplification

B) Protection

C) Triggering

D) Commutation

**Correct: C**

**2264. Which of the following thyristors can be turned off using a gate signal?**

A) TRIAC

B) DIAC

C) GTO

D) SCR

**Correct: C**

**2265. 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**

**2266. 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**

**2267. Gate characteristics of SCR relate gate current with:**

A) Anode voltage

B) Cathode voltage

C) Gate voltage

D) Anode current

**Correct: C**

**2268. 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**

**2269. Which triggering method uses a pulse transformer?**

A) Capacitive triggering

B) Optical triggering

C) Pulse triggering

D) DC triggering

**Correct: C**

**2270. During reverse blocking mode, SCR behaves like a:**

A) Short circuit

B) Open circuit

C) Diode

D) Zener

**Correct: B**

**2271. What controls the output of a phase-controlled rectifier?**

A) Load resistance

B) Firing angle

C) Output current

D) Input frequency

**Correct: B**

**2272. 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**

**2273. Thyristor protection circuits include:**

A) Filters

B) RC snubber

C) EMI suppressor

D) Rectifiers

**Correct: B**

**2274. 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**

**2275. 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**

**2276. Which device can control AC power in both directions?**

A) SCR

B) GTO

C) TRIAC

D) BJT  
**Correct: C**

**2277. The gate power loss in SCRs is typically:**

- A) High
  - B) Negligible
  - C) Medium
  - D) Depends on load
- Correct: B**

**2278. 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**

**2279. Commutation means:**

- A) Applying forward voltage
  - B) Increasing gate pulse
  - C) Turning off the thyristor
  - D) Providing snubber
- Correct: C**

**2280. 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**

**2281. 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**

**2282. 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**

**2283. A high-frequency thyristor trigger circuit often uses:**

- A) Relay
  - B) Pulse transformer
  - C) Inductor
  - D) Thermistor
- Correct: B**

**2284. Thyristor can be triggered by:**

- A) Gate voltage
- B) Heat
- C) Light

D) All of the above

**Correct: D**

**2285. For AC voltage control using thyristor, which is most suitable?**

A) Chopper

B) Inverter

C) TRIAC

D) Diode

**Correct: C**

**2286. 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**

**2287. Which of the following is not a type of commutation?**

A) Natural

B) Forced

C) Resonant

D) Synchronous

**Correct: D**

**2288. The number of PN junctions in an SCR is:**

A) 1

B) 2

C) 3

D) 4

**Correct: C**

**2289. A TRIAC can be triggered in:**

A) Only one quadrant

B) Two quadrants

C) Three quadrants

D) All four quadrants

**Correct: D**

**2290. 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**

**2291. Which device is most suitable for switching high current loads in AC circuits?**

A) BJT

B) TRIAC

C) MOSFET

D) UJT

**Correct: B**

**2292. 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**

**2293. The turn-off process in a thyristor is also known as:**

- A) Triggering
- B) Firing
- C) Commutation
- D) Conduction

**Correct: C**

**2294. Which thyristor family member can be turned off via gate signal?**

- A) GTO
- B) TRIAC
- C) SCR
- D) DIAC

**Correct: A**

**2295. A light-triggered thyristor is known as:**

- A) LASCR
- B) DIAC
- C) TRIAC
- D) Opto-isolator

**Correct: A**

**2296. 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**

**2297. 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**

**2298. Which component is commonly used to suppress high  $dv/dt$  in thyristor circuits?**

- A) Capacitor
- B) Fuse
- C) Resistor
- D) RC Snubber

**Correct: D**

**2299. Which thyristor has symmetrical V-I characteristics?**

- A) SCR
- B) TRIAC
- C) DIAC
- D) GTO

**Correct: B**

**2300. In a TRIAC, MT1 and MT2 refer to:**

- A) Gate terminals
- B) Main terminals
- C) Trigger terminals

D) Transformer taps

**Correct: B**

2301. **The gate current required for triggering is usually:**

A) AC

B) DC

C) High-frequency

D) Reverse-polarity

**Correct: B**

2302. **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**

2303. **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**

2304. **TRIAC can be used for:**

A) Only DC circuits

B) Both AC and DC

C) Only AC circuits

D) High-frequency circuits

**Correct: C**

2305. **Which of the following is a unidirectional device?**

A) TRIAC

B) DIAC

C) SCR

D) GTO

**Correct: C**

2306. **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**

2307. **In a resistive load, current and voltage are:**

A) Out of phase

B) In phase

C) Opposite in direction

D) Zero

**Correct: B**

2308. **Which device is best suited for AC light dimmer control?**

A) SCR

B) DIAC

C) TRIAC

D) BJT

**Correct: C**

**2309. Triggering angle control in TRIAC circuits is achieved using:**

A) Transformer

B) RC Network

C) Inductor

D) Heat sink

**Correct: B**

**2310. 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**

**2311. 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**

**2312. 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**

**2313. In a single-phase full converter, the average output voltage is zero when firing angle is:**

A)  $0^\circ$

B)  $90^\circ$

C)  $120^\circ$

D)  $180^\circ$

**Correct: B**

**2314. Which of the following is a natural commutation method?**

A) Class A

B) Class B

C) Class C

D) Class E

**Correct: A**

**2315. In power electronics, SCR is mostly used as a:**

A) Signal amplifier

B) Current booster

C) Controlled rectifier

D) Transistor substitute

**Correct: C**

**2316. Which of the following is not a thyristor family device?**

A) GTO

B) TRIAC

C) DIAC

D) BJT

**Correct: D**

**2317. 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**

**2318. GTO requires what type of gate pulse to turn off?**

- A) Positive
- B) AC
- C) Negative
- D) Pulsed DC

**Correct: C**

**2319. 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**

**2320. Turn-off time in an SCR is measured in:**

- A) Seconds
- B) Milliseconds
- C) Microseconds
- D) Nanoseconds

**Correct: C**

**2321. Thyristor ratings are usually given for:**

- A) DC only
- B) AC only
- C) Both AC and DC
- D) Variable frequency

**Correct: C**

**2322. 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**

**2323.  $dv/dt$  effect can be minimized using:**

- A) Heat sink
- B) RC snubber
- C) Inductor
- D) Pulse transformer

**Correct: B**

**2324. Class B commutation is also called:**

- A) Voltage commutation
- B) Current commutation
- C) Load commutation

D) Resonant commutation

**Correct: A**

**2325. TRIAC replaces:**

A) Two SCRs in antiparallel

B) One BJT

C) Two BJTs

D) One MOSFET

**Correct: A**

**2326. Which device is turned on by gate current and turned off by load current?**

A) SCR

B) TRIAC

C) GTO

D) DIAC

**Correct: A**

**2327. To isolate control and power circuits, which device is used?**

A) GTO

B) UJT

C) Opto-coupler

D) TRIAC

**Correct: C**

**2328. In Class C commutation, the commutation is achieved using:**

A) Load

B) Capacitor and SCR

C) Transformer

D) Freewheeling diode

**Correct: B**

**2329. 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**

**2330. The conduction angle in a controlled rectifier is:**

A)  $360^\circ$

B)  $180^\circ$

C)  $(180^\circ - \alpha)$

D)  $(180^\circ + \alpha)$

**Correct: C**

**2331. In dual converters, the control technique used is:**

A) Voltage commutation

B) Complementary firing

C) Series resonance

D) Zero-voltage switching

**Correct: B**

**2332. A GTO can be used in:**

A) Low power AC drives

B) High power DC drives

C) Communication systems



D) Audio amplifiers

**Correct: B**

**2333. 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**

**2334. A commutation circuit is used to:**

A) Trigger SCR

B) Turn off SCR

C) Protect from overvoltage

D) Amplify signal

**Correct: B**

**2335. Reverse blocking capability is essential in:**

A) TRIAC

B) GTO

C) SCR

D) DIAC

**Correct: C**

**2336. 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**

**2337. 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

**2338. 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**

**2339. 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**

**2340. Which one is not a turn-off method of SCR?**

A) Forced commutation

B) Natural commutation

C) Gate commutation

D) Line commutation

**Correct: C**

**2341. The turn-on time of an SCR is in the range of:**

A) 1-5 seconds

B) 1-10 ms

C) 1-10  $\mu$ s

D) 1-10 ns

**Correct: C**

**2342. What is the function of a snubber circuit?**

A) Amplification

B) Noise generation

C) dv/dt protection

D) Boosting power

**Correct: C**

**2343. The phase control method in thyristors is based on varying the:**

A) Load resistance

B) Frequency

C) Firing angle

D) Supply voltage

**Correct: C**

**2344. Which device is turned off when anode current < holding current?**

A) GTO

B) TRIAC

C) SCR

D) All of the above

**Correct: D**

**2345. Which type of load is most critical for SCR commutation?**

A) Resistive

B) Capacitive

C) Inductive

D) Linear

**Correct: C**

**2346. TRIAC triggering uses a DIAC to:**

A) Delay conduction

B) Provide pulse shaping

C) Provide symmetrical triggering

D) Increase power

**Correct: C**

**2347. In AC circuits, SCR commutation is simpler because of:**

A) Constant voltage

B) Voltage zero-crossing

C) Current spikes

D) High power

**Correct: B**

**2348. GTO is most suitable for:**

A) Small signal amplification

B) Low power switching

C) High power, high voltage applications

D) Oscillator circuits

**Correct: C**

**2349. 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**

**2350. Which is used for triggering a high-power SCR?**

A) Capacitor

B) Transformer

C) Pulse transformer

D) DIAC

**Correct: C**

**2351. 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**

**2352. Which of these is not part of an SCR structure?**

A) P-layer

B) N-layer

C) Gate junction

D) Collector

**Correct: D**

**2353. SCR commutation is the process of:**

A) Latching the device

B) Triggering it

C) Turning it off

D) Turning it on

**Correct: C**

**2354. Which thyristor is most suitable for high-speed switching?**

A) TRIAC

B) LASCR

C) GTO

D) SCR

**Correct: C**

**2355. 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**

**2356. 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**

**2357. A freewheeling diode is used in:**

- A) Capacitive load
- B) Pure resistive load
- C) Inductive load
- D) Constant power load

**Correct: C**

**2358. In forced commutation, thyristor is turned off by:**

- A) Reducing gate current
- B) Forcing reverse current
- C) Triggering DIAC
- D) Reducing voltage

**Correct: B**

**2359. 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**

**2360. The most important characteristic of a power thyristor is:**

- A) Low gain
- B) Triggering time
- C) High power handling
- D) Small size

**Correct: C**

**2361. 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**

**2362. LASCR is a thyristor that is:**

- A) Gate-controlled
- B) Light-activated
- C) Logic-controlled
- D) Line-commutated

**Correct: B**

**2363. The gate current required for firing an SCR is typically in the range of:**

- A) Nanoamperes
- B) Microamperes
- C) Milliamperes
- D) Amperes

**Correct: C**

**2364. Which thyristor-based device is commonly used in power control of domestic appliances?**

- A) DIAC
- B) TRIAC
- C) GTO

D) LASCR  
**Correct: B**

**2365. 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**

**2366. SCRs used in AC voltage regulators control:**

- A) RMS value of voltage
  - B) Frequency
  - C) Current
  - D) Load resistance
- Correct: A**

**2367. 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**

**2368. Thyristors are not preferred in:**

- A) Relay control
  - B) Frequency control
  - C) Power switching
  - D) Controlled rectifiers
- Correct: B**

**2369. 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**

**2370. 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**

**2371. The SCR must be triggered into conduction in which region?**

- A) Reverse blocking
  - B) Forward blocking
  - C) Conduction region
  - D) Cut-off
- Correct: B**

**2372. Which device offers symmetrical bidirectional control with a gate?**

- A) SCR
- B) GTO
- C) TRIAC

D) DIAC  
**Correct: C**

**2373. To ensure proper turn-off, an SCR must be:**

- A) Heated
  - B) Reverse biased
  - C) Forward biased
  - D) Gate pulsed
- Correct: B**

**2374. Which of the following can protect thyristors from surge currents?**

- A) RC snubber
  - B) Pulse transformer
  - C) Series inductor
  - D) Fuse
- Correct: D**

**2375. 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**

**2376. 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**

**2377. Commutation circuits are used in:**

- A) UJT
  - B) BJTs
  - C) SCRs
  - D) DIACs
- Correct: C**

**2378. 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**

**2379. 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**

**2380. 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**

**2381. The maximum repetitive reverse voltage in an SCR is termed:**

A) VRRM

B) VBO

C) VBR

D) VDRM

**Correct: D**

**2382. In a single-phase full converter, the firing angle can vary between:**

A)  $0^\circ$  to  $90^\circ$

B)  $0^\circ$  to  $180^\circ$

C)  $90^\circ$  to  $180^\circ$

D)  $180^\circ$  to  $360^\circ$

**Correct: B**

**2383. Which device is known as a bidirectional trigger diode?**

A) DIAC

B) TRIAC

C) SCR

D) LASCR

**Correct: A**

**2384. 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**

**2385. 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**

**2386. Which thyristor device can be switched off by applying a negative gate current?**

A) SCR

B) GTO

C) TRIAC

D) DIAC

**Correct: B**

**2387. 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**

## **II. ELECTRONICS**

2388. What is a photocell primarily used for?
- (a) Generating sound
  - (b) **Detecting light intensity**
  - (c) Amplifying current
  - (d) Storing electrical energy
2389. A photocell operates based on which effect?
- (a) Hall effect
  - (b) Thermoelectric effect
  - (c) **Photoelectric effect**
  - (d) Electromagnetic induction
2390. 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
2391. Which of the following is *not* an application of photocells?
- (a) Smoke detection
  - (b) TV remote control
  - (c) Automatic street lights
  - (d) **Audio amplification**
2392. Photocells convert light energy into which type of energy?
- (a) **Thermal**
  - (b) **Mechanical**
  - (c) Electrical
  - (d) **Magnetic**
2393. The output of a photocell is generally
- (a) AC voltage
  - (b) **DC voltage**
  - (c) Magnetic field
  - (d) Sound wave
2394. 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**
2395. Which of the following sensors is not a photoelectric sensor?
- (a) Through-beam
  - (b) Retro-reflective
  - (c) **Inductive proximity**



- (d) Diffuse reflective
2396. What is the longest sensing range typically found in photoelectric sensors?
- (a) Diffuse type
  - (b) Retro-reflective
  - (c) **Through-beam**
  - (d) Capacitive
2397. 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
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 type of proximity sensor can detect both metallic and non-metallic objects?
- (a) Inductive
  - (b) **Capacitive**
  - (c) Magnetic
  - (d) Optical
2400. 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
2401. 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**
2402. An inductive proximity switch works best with which of the following targets?
- (a) Wood
  - (b) Glass
  - (c) Aluminum
  - (d) **Steel**
2403. Which proximity switch uses the Doppler effect for object detection?
- (a) Inductive
  - (b) Capacitive
  - (c) **Ultrasonic**

- (d) Magnetic
- 2404. 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
- 2405. 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
- 2406. 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
- 2407. 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
- 2408. 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)**
- 2409. 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
- 2410. 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
- 2411. 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

2412. A capacitive proximity switch may malfunction if exposed to:
- (a) Metal chips
  - (b) Dry air
  - (c) **High humidity or moisture**
  - (d) Stainless steel
2413. 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
2414. 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
2415. 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
2416. Which of the following devices allows current to flow only in one direction?
- (a) Resistor
  - (b) Capacitor
  - (c) **Diode**
  - (d) Inductor
2417. The unit of capacitance is:
- (a) Henry
  - (b) Ohm
  - (c) **Farad**
  - (d) Volt
2418. 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
2419. In an RC circuit, the time constant ( $\tau$ ) is given by:
- (a)  $R + C$
  - (b)  **$RC$**
  - (c)  $R/C$
  - (d)  $1/RC$

2420. Which component stores energy in the form of a magnetic field?
- (a) Capacitor
  - (b) Resistor
  - (c) Diode
  - (d) Inductor**
2421. 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
2422. Which of the following is a unidirectional semiconductor device?
- (a) Zener diode
  - (b) Bipolar junction transistor
  - (c) SCR (Silicon Controlled Rectifier)
  - (d) LED
2423. 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
2424. 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
2425. 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
2426. A Zener diode is used in electronic circuits primarily for:
- (a) Rectification
  - (b) Amplification
  - (c) Voltage regulation**
  - (d) Oscillation
2427. 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
2428. The current gain ( $\beta$ ) of a BJT is defined as:
- (a)  $I_E / I_C$
  - (b)  $I_C / I_B$**
  - (c)  $V_{CE} / V_{BE}$

(d) IB / IC

**2429. 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

**2430. In an ideal op-amp, the input impedance is:**

- (a) Zero
- (b) Very low
- (c) Very high (ideally infinite)**
- (d) Equal to output impedance

**2431. Which configuration of a BJT gives the highest input impedance?**

- (a) Common Emitter
- (b) Common Base
- (c) Common Collector**
- (d) Darlington Pair

**2432. 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

**2433. A NOT gate has an input of logic '1'. The output will be:**

- (a) 0**
- (b) 1
- (c) Undefined
- (d) Same as input

**2434. 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

**2435. 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

**2436. What type of junction is used in a basic diode?**

- (a) NN
- (b) PN**
- (c) PP

(d) NP

**2437. 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

**2438. In reverse bias, a diode conducts:**

- (a) Fully
- (b) Slightly (leakage current)**
- (c) With high efficiency
- (d) Like a battery

**2439. 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

**2440. 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

**2441. Which diode emits light when forward biased?**

- (a) Zener diode
- (b) LED**
- (c) Photodiode
- (d) Tunnel diode

**2442. Which diode works in reverse bias and generates current in response to light?**

- (a) LED
- (b) Zener diode
- (c) Photodiode**
- (d) Schottky diode

**2443. 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

**2444. A tunnel diode is used in:**

- (a) Low-frequency rectification
- (b) High-frequency oscillators**
- (c) Signal clipping
- (d) Voltage regulation

**2445. 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
2446. In a full-wave bridge rectifier, how many diodes conduct at a time?
- A) 1
  - B) 2**
  - C) 3
  - D) 4
2447. 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
2448. Clipping circuits are used to:
- (a) Convert AC to DC
  - (b) Remove portions of signal**
  - (c) Amplify signals
  - (d) Invert signals
2449. Clamping circuits shift the:
- (a) Frequency of waveform
  - (b) Amplitude & frequency
  - (c) DC level**
  - (d) Phase
2450. The maximum current a diode can safely conduct is called:
- (a) Peak inverse current
  - (b) Average forward current**
  - (c) Reverse leakage
  - (d) Breakdown current
2451. What is reverse leakage current in a diode?
- (a) Forward conduction
  - (b) Current during reverse bias**
  - (c) Peak current
  - (d) None of the above
2452. Which factor affects the reverse recovery time of a diode?
- (a) Material**
  - (b) Load resistance
  - (c) Capacitance
  - (d) Operating temperature
2453. Which diode parameter is most important for high-speed switching?
- (a) Reverse voltage rating
  - (b) Capacitance
  - (c) Recovery time**
  - (d) Forward current

2454. The dynamic resistance of a diode is calculated using:
- (a) Ohm's law
  - (b)  $dV/dI$  in forward region**
  - (c) Power formula
  - (d)  $P = IV$
2455. Which application uses a Zener diode?
- (a) Current amplification
  - (b) Frequency modulation
  - (c) Overvoltage protection**
  - (d) Filtering
2456. Which diode is used in RF tuning circuits?
- (a) LED
  - (b) Zener diode
  - (c) Varactor diode**
  - (d) Tunnel diode
2457. Photodiodes are typically operated in:
- (a) Forward bias
  - (b) Reverse bias**
  - (c) Zero bias
  - (d) Breakdown region
2458. 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
2459. Dynamic resistance is important in:
- (a) DC circuits only
  - (b) Small signal AC analysis**
  - (c) Power calculations
  - (d) Reverse bias condition only
2460. If the diode's forward current increases, its dynamic resistance:
- (a) Increases
  - (b) Decreases**
  - (c) Remains constant
  - (d) Becomes zero
2461. Zener breakdown occurs due to:
- (a) High temperature
  - (b) Avalanche multiplication
  - (c) Tunneling of electrons**
  - (d) Recombination of holes
2462. Avalanche breakdown is dominant in Zener diodes above:
- (a) 1V
  - (b) 5.6V**
  - (c) 0.7V



- (d) 10V
2463. Zener diodes are generally operated in:
- (a) Forward bias
  - (b) **Reverse breakdown region**
  - (c) Zero bias
  - (d) Cut-off mode
2464. 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
2465. If Zener diode voltage rating is 6V, it will maintain:
- (a) 0V
  - (b) **Constant 6V across load**
  - (c) 12V
  - (d) Varies with current
2466. Schottky diodes are formed by the junction of:
- (a) P-N
  - (b) **Metal-Semiconductor**
  - (c) N-P-N
  - (d) P-type metals
2467. 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
2468. The forward voltage drop of a Schottky diode is approximately:
- (a) **0.2V–0.3V**
  - (b) 0.6V
  - (c) 1.5V
  - (d) 3V
2469. Which of the following is preferred in high-speed switching circuits?
- (a) Zener diode
  - (b) Tunnel diode
  - (c) **Schottky diode**
  - (d) Varactor diode
2470. Tunnel diode works due to:
- (a) Avalanche breakdown
  - (b) **Tunneling effect in heavily doped P-N junction**
  - (c) Magnetic coupling
  - (d) Emission of photons
2471. Tunnel diode shows negative resistance in its:
- (a) Breakdown region
  - (b) **Peak to valley region**

- (c) Forward bias saturation
  - (d) Reverse bias only
2472. Which of the following is considered the fastest diode?
- (a) Tunnel diode
  - (b) Schottky diode
  - (c) **Step recovery diode**
  - (d) LED
2473. Step recovery diodes are typically used in:
- (a) Rectification
  - (b) **High-frequency pulse generation**
  - (c) Voltage clamping
  - (d) Light emission
2474. A varactor diode is also known as a:
- (a) Switching diode
  - (b) **Variable capacitor diode**
  - (c) Amplifying diode
  - (d) Breakdown diode
2475. In a varactor diode, the capacitance is controlled by:
- (a) Current
  - (b) Temperature
  - (c) **Reverse voltage**
  - (d) Forward voltage
2476. Varactor diodes are commonly used in:
- (a) **Oscillators and RF tuning circuits**
  - (b) Power supply filtering
  - (c) Amplifier biasing
  - (d) Bridge rectifiers
2477. The capacitance of a varactor diode:
- (a) Increases with reverse voltage
  - (b) Remains constant
  - (c) **Decreases with reverse voltage**
  - (d) Only depends on frequency
2478. 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
2479. 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
2480. 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
2481. 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
2482. A transistor has how many terminals?
- A) 2
  - B) 3**
  - C) 4
  - D) 5
2483. The three terminals of a BJT are:
- (a) Anode, Cathode, Plate
  - (b) Source, Gate, Drain
  - (c) **Emitter, Base, Collector**
  - (d) Positive, Negative, Neutral
2484. Which transistor is more commonly used in switching applications?
- (a) UJT
  - (b) FET
  - (c) **BJT**
  - (d) Zener
2485. Which of the following is a unipolar device?
- (a) BJT
  - (b) SCR
  - (c) **FET**
  - (d) Diode
2486. In a BJT, current conduction is due to:
- (a) Electrons only
  - (b) Holes only
  - (c) **Both electrons and holes**
  - (d) Ions
2487. In an NPN transistor, the arrow on the emitter points:
- (a) Inward
  - (b) **Outward**
  - (c) Towards collector
  - (d) No direction
2488. Which region of a BJT is thin and lightly doped?
- (a) Collector
  - (b) **Base**
  - (c) Emitter
  - (d) Substrate

2489. What is  $\beta$  (beta) in a BJT?
- (a) Input resistance
  - (b) Voltage gain
  - (c) **Collector current / base current gain**
  - (d) Current loss factor
2490. In which region does a BJT act as an amplifier?
- (a) Cut-off
  - (b) Saturation
  - (c) **Active**
  - (d) Breakdown
2491. Biasing is necessary in a BJT to:
- (a) Increase size
  - (b) Reduce cost
  - (c) **Set Q-point and allow amplification**
  - (d) Change material
2492. Which biasing method provides the best thermal stability for transistor?
- (a) Fixed bias
  - (b) **Voltage-divider bias**
  - (c) Collector-feedback bias
  - (d) Self-bias
2493. 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
2494. 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
2495. In CE configuration of BJT, the phase shift between input and output is:
- (a)  $0^\circ$
  - (b)  $90^\circ$
  - (c)  **$180^\circ$**
  - (d)  $360^\circ$
2496. For BJT, Voltage gain is highest in which configuration?
- (a) **CE**
  - (b) CB
  - (c) CC
  - (d) Emitter follower
2497. In BJT configuration, AC load line is drawn to analyze:
- (a) Power loss
  - (b) Large signal behavior

- (c) **Output voltage swing**
  - (d) DC biasing
2498. The input impedance of a BJT CE (Common Emitter) amplifier is typically:
- (a) Very high
  - (b) **Low**
  - (c) Infinite
  - (d) Zero
2499. In small signal analysis, transistor acts as:
- (a) Open circuit
  - (b) Constant current source
  - (c) Capacitor
  - (d) **Amplifier with gain**
2500. In saturation mode, a BJT behaves as a:
- (a) Resistor
  - (b) Open circuit
  - (c) **Closed switch**
  - (d) Amplifier
2501. A transistor switch is OFF when it is in:
- (a) Active mode
  - (b) Saturation
  - (c) **Cut-off**
  - (d) Breakdown
2502. In switching circuits, the collector-emitter voltage in ON state is:
- (a) Zero
  - (b) **Very low**
  - (c) Very high
  - (d) Equal to supply
2503. Transistors used in logic gates operate mainly in:
- (a) Linear region
  - (b) Active mode
  - (c) **Switching (cut-off/saturation)**
  - (d) Breakdown region
2504. 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
2505. A JFET is controlled by:
- (a) Current
  - (b) **Voltage at gate**
  - (c) Collector resistance
  - (d) Diode bias
2506. 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

**2507. The gate of a JFET is always:**

- (a) Forward biased
- (b) Reverse biased**
- (c) Shorted
- (d) Grounded

**2508. In N-channel JFET, current flows from:**

- (a) Source to drain**
- (b) Drain to source
- (c) Gate to source
- (d) Gate to drain

**2509. The region in JFET where current remains constant is:**

- (a) Ohmic region
- (b) Saturation region**
- (c) Cut-off region
- (d) Breakdown

**2510. A Darlington pair offers:**

- (a) High voltage gain
- (b) High input resistance
- (c) Very high current gain**
- (d) Low power consumption

**2511. The output of a phototransistor depends on:**

- (a) Temperature
- (b) Input current
- (c) Light intensity**
- (d) Biasing voltage

**2512. A UJT is mainly used in:**

- (a) Power amplification
- (b) Voltage regulation
- (c) Oscillator circuits**
- (d) Rectification

**2513. Which device combines two BJTs into one package?**

- (a) Phototransistor
- (b) UJT
- (c) Darlington pair**
- (d) FET

**2514. Power transistors are designed to handle:**

- (a) Low current only
- (b) High voltage and current**
- (c) High frequency only
- (d) Small signal only

**2515. 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**
2516. A transistor amplifier increases:
- (a) Resistance
  - (b) Capacitance
  - (c) **Signal power**
  - (d) Supply voltage
2517. Which of the following is not a typical transistor application?
- (a) **Rectifier**
  - (b) Amplifier
  - (c) Switch
  - (d) Oscillator
2518. In ICs, transistors are used in the form of:
- (a) Individual components
  - (b) Diodes
  - (c) **Transistor arrays**
  - (d) Relays
2519. A transistor tester mainly checks:
- (a) Resistance
  - (b) Capacitance
  - (c) Forward junctions
  - (d) **Current gain**
2520. Which transistor configuration offers the highest voltage gain?
- (a) Common Base
  - (b) **Common Emitter**
  - (c) Common Collector
  - (d) All are equal
2521. Which transistor configuration is commonly used for impedance matching?
- (a) Common Emitter
  - (b) **Common Collector**
  - (c) Common Base
  - (d) None of the above
2522. In which transistor configuration is the input resistance the lowest?
- (a) Common Emitter
  - (b) Common Collector
  - (c) **Common Base**
  - (d) All equal
2523. Common base configuration is mainly used in:
- (a) Voltage regulation
  - (b) Low-frequency amplification
  - (c) **High-frequency applications**
  - (d) Switching circuits
2524. The common collector configuration is also known as:
- (a) **Emitter follower**
  - (b) Base follower

- (c) Voltage amplifier
  - (d) Phase shifter
2525. Fixed bias circuit suffers from:
- (a) **Stability issues**
  - (b) High gain
  - (c) Low distortion
  - (d) High input impedance
2526. Voltage divider biasing is mostly used in:
- (a) Class D amplifiers
  - (b) Logic gates
  - (c) **Audio amplifiers**
  - (d) Oscillators
2527. In collector-feedback bias, stability is achieved using:
- (a) Capacitor
  - (b) **Resistor feedback from collector to base**
  - (c) Transformer
  - (d) Zener diode
2528. Thermal runaway is reduced by:
- (a) Increasing supply voltage
  - (b) Using fixed bias
  - (c) **Using emitter resistor in biasing**
  - (d) Removing heat sink
2529. JFET is a:
- (a) **Voltage-controlled current device**
  - (b) Current-controlled voltage device
  - (c) Voltage amplifier
  - (d) Rectifier
2530. Compared to BJT, JFET has:
- (a) Lower input impedance
  - (b) **Higher input impedance**
  - (c) Higher noise
  - (d) Higher current gain
2531. Which device is preferred in low-noise amplifiers?
- (a) BJT
  - (b) SCR
  - (c) **JFET**
  - (d) Diode
2532. JFETs are better than BJTs for:
- (a) Power amplification
  - (b) RF switching
  - (c) Digital logic
  - (d) **Low signal input amplification**
2533. 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
2534. The JFET operates in saturation region for:
- (a) **Constant drain current**
  - (b) Maximum gain
  - (c) Breakdown operation
  - (d) Zero current flow
2535. 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
2536. When  $V_{gs} = 0$ , the JFET conducts:
- (a) **Maximum current**
  - (b) Minimum current
  - (c) No current
  - (d) Reverse current
2537. JFET input characteristic is like:
- (a) A forward-biased diode
  - (b) **Reverse-biased junction**
  - (c) Zener diode
  - (d) Triac
2538. 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
2539. In power amplifiers, the transistor works in:
- (a) Cut-off
  - (b) **Active region**
  - (c) Breakdown region
  - (d) Forward-biased region only
2540. Power transistors are most commonly found in:
- (a) Digital logic
  - (b) **Power supplies and amplifiers**
  - (c) Low-voltage detectors
  - (d) Oscillators
2541. 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
2542. UJT is most commonly used in:
- (a) Amplifiers
  - (b) Oscillators and triggering circuits

- (c) Rectifiers
  - (d) Current regulators
- Answer: B

**2543.** The most important application of UJT is in:

- (a) Clipping circuits
- (b) Sawtooth waveform generation
- (c) Voltage regulation
- (d) High-frequency amplification

Answer: B

**2544.** UJT relaxation oscillator output is typically:

- (a) Square wave
- (b) Sine wave
- (c) Sawtooth wave
- (d) Triangular wave

Answer: C

**2545.** 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

**2546.** 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

**2547.** Photo transistors are used in:

- (a) Voltage regulators
- (b) Light-sensitive switches
- (c) Oscillators
- (d) Transformers

Answer: B

**2548.** Photo transistor operates effectively in which region?

- (a) Cut-off
- (b) Active
- (c) Breakdown
- (d) Saturation

Answer: B

**2549.** In a photo transistor, light increases:

- (a) Collector current
- (b) Emitter voltage
- (c) Resistance
- (d) Power loss

Answer: A

**2550.** Which is NOT a common use of photo transistor?

- (a) Object detection
- (b) Light sensing
- (c) Audio amplification
- (d) Optical Encoder feedback

Answer: C

**2551.** 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

**2552.** The current gain of a Darlington pair is approximately:

- (a)  $\beta$
- (b)  $2\beta$
- (c)  $\beta_1 + \beta_2$
- (d)  $\beta_1 \times \beta_2$

Answer: D

**2553.** Darlington transistors are used in:

- (a) RF applications
- (b) Power switching and amplifiers
- (c) Oscillators
- (d) Tuning circuits

Answer: B

**2554.** 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

**2555.** SCR stands for:

- (a) Silicon Capacitor Resistor
- (b) Silicon Controlled Rectifier
- (c) Series Current Regulator
- (d) Single Circuit Resistor

Answer: B

**2556.** How many terminals does an SCR have?

- A) 2
- B) 3
- C) 4
- D) 5

Answer: B

**2557.** 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

**2558.** 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

**2559.** The SCR is a type of:  
(a) Unidirectional switch  
(b) Amplifier  
(c) Bipolar transistor  
(d) Bidirectional device  
Answer: A

**2560.** 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

**2561.** 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

**2562.** 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

**2563.** 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

**2564.** 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

**2565.** Which is NOT a method of triggering an SCR?

- (a) Gate triggering
- (b)  $dv/dt$  triggering
- (c) Magnetic triggering
- (d) Thermal triggering  
Answer: C

**2566.**  $dv/dt$  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

**2567.** 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

**2568.** Forced commutation is mainly used in:

- (a) AC circuits
- (b) High-frequency DC circuits
- (c) Low-frequency AC motors
- (d) Transformers  
Answer: B

**2569.** Which commutation method is most commonly used in inverter circuits?

- (a) Class A
- (b) Class C
- (c) Class E
- (d) Class B  
Answer: C

**2570.**  $dv/dt$  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

**2571.** High  $dv/dt$  across SCR may cause:

- (a) Delay in conduction
- (b) Reverse bias
- (c) False triggering

- (d) Decrease in holding current  
Answer: C

**2572.** A snubber circuit is used to protect SCR from:

- (a) Low voltage
- (b) Overcurrent
- (c)  $dv/dt$  effect
- (d) Gate noise  
Answer: C

**2573.**  $di/dt$  protection is usually provided using:

- (a) Capacitor in parallel
- (b) Fuse
- (c) Inductor in series
- (d) Resistor in gate circuit  
Answer: C

**2574.** 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

**2575.** SCR is NOT typically used in:

- (a) Motor speed control
- (b) AC voltage regulation
- (c) RF signal amplification
- (d) Phase control  
Answer: C

**2576.** A light-triggered SCR is called:

- (a) DIAC
- (b) LASCR
- (c) TRIAC
- (d) GTO

Answer: B

**2577.** Compared to TRIAC, SCR is:

- (a) Bidirectional
- (b) Unidirectional
- (c) Used in RF circuits
- (d) More commonly used in lamps  
Answer: B

**2578.** SCR is also known as a:

- (a) Voltage-controlled switch
- (b) Phase inverter
- (c) Thyristor

- (d) Transformer
- Answer: C

**2579.** In a controlled rectifier using SCR, the firing angle controls:

- (a) Output frequency
  - (b) Output voltage
  - (c) Current gain
  - (d) Efficiency
- Answer: B

**2580.** 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

**2581.** If the firing angle of an SCR in an AC half-wave rectifier is increased from  $30^\circ$  to  $90^\circ$ , the average output voltage will:

- (a) Increase
  - (b) Remain the same
  - (c) Decrease
  - (d) Become zero
- Answer: C

**2582.** In a single-phase full-wave controlled rectifier, if the firing angle is  $180^\circ$ , the output voltage is:

- (a) Maximum
  - (b) Half of peak voltage
  - (c) Zero
  - (d) Negative
- Answer: C

**2583.** 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

**2584.** For an SCR to conduct in each cycle, the firing angle must be:

- (a) Greater than  $180^\circ$
  - (b) Less than or equal to  $180^\circ$
  - (c) Between  $270^\circ$  and  $360^\circ$
  - (d) Zero
- Answer: B

**2585.** The input impedance of a FET is generally:

- (a) Low
- (b) Very high
- (c) Zero

- (d) Medium
- Answer: B

**2586.** Which FET configuration has unity voltage gain?

- (a) Common Gate
- (b) Common Drain
- (c) Common Source
- (d) All of the above

Answer: B

**2587. Which of the following can operate in both depletion and enhancement modes?**

- (a) JFET
- (b) BJT
- (c) Depletion MOSFET
- (d) UJT

Answer: C

**2588. 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

**2589. What protects a MOSFET from static damage?**

- (a) Heat sink
- (b) Biasing resistors
- (c) Gate protection diode
- (d) Series inductor

Answer: C

**2590. 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

**2591. MESFET stands for:**

- (a) Metal Electron Semiconductor FET
- (b) Metal Semiconductor FET
- (c) Metal Electric Semiconductor FET
- (d) Metallic Enhanced Semiconductor FET

Answer: B

**2592. CMOS is widely used in:**

- (a) High-power applications
- (b) Digital integrated circuits



- (c) Audio frequency amplifiers
  - (d) Electroplating
- Answer: B

**2593. Which transistor has better switching speed?**

- (a) BJT
- (b) IGBT
- (c) MOSFET
- (d) UJT

Answer: C

**2594. A key feature of CMOS is:**

- (a) Low speed
- (b) Low static power consumption
- (c) High heat generation
- (d) High voltage drop

Answer: B

**2595. The biggest disadvantage of MOSFET is:**

- (a) High speed
- (b) Susceptibility to static charge
- (c) High power dissipation
- (d) Difficult biasing

Answer: B

**2596. 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

**2597. 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

**2598. 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

**2599. 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

**2600.** 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

**2601.** 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

**2602.** 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

**2603.** Which voltage regulator provides 5V output in a fixed regulator series?

- (a) 7809
- (b) 7812
- (c) 7905
- (d) 7805

Answer: D

**2604.** LM317 is best used for:

- (a) Fixed positive voltage
- (b) Negative voltage
- (c) Adjustable voltage regulation
- (d) AC voltage control

Answer: C

**2605.** Which logic family is best known for low power consumption?

- (a) ECL
- (b) TTL
- (c) CMOS
- (d) RTL

Answer: C

**2606.** In practical digital circuits, a NOT gate can be implemented using IC:

- (a) 7408
- (b) 7432
- (c) 7400

(d) 7404

Answer: D

**2607.** The most accurate and fastest ADC type is:

- (a) Flash
- (b) Dual slope
- (c) Counter type
- (d) Successive approximation

Answer: A

**2608.** 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

**2609.** Which IC is most suitable for designing a small audio amplifier?

- (a) 741
- (b) 7805
- (c) LM386
- (d) 555

Answer: C

**2610.** 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

**2611.** 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

**2612.** 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

**2613.** Which IC is classified under digital ICs?

- (a) LM317
- (b) LM741
- (c) 7408 AND Gate

(d) LM386  
Answer: C) 7408 AND Gate

**2614.** Linear ICs are commonly used in:

- (a) Counters
- (b) Amplifiers
- (c) Logic operations
- (d) Flip-flops

Answer: B) Amplifiers

**2615.** 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)

**2616.** 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

**2617.** 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)

**2618.** 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)

**2619.** 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

**2620.** Which of the following is NOT a surface-mount package?

- (a) QFP
- (b) BGA
- (c) DIP

(d) SOT  
Answer: C) DIP

**2621.** 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

**2622.** The control input of an IGBT is:

- (a) Voltage-controlled
- (b) Current-controlled
- (c) Temperature-controlled
- (d) Light-controlled

**Answer:** A)

**2623.** Which application does NOT typically use IGBT?

- (a) Electric trains
- (b) Microwave ovens
- (c) Induction cooktops
- (d) High-speed RF amplifiers

Answer: D)

**2624.** 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)

**2625.** 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

**2626.** 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)

**2627.** 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

**2628.** 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

**2629.** Among the following, which device generally has the **highest switching speed**?

- (a) IGBT
- (b) BJT
- (c) MOSFET
- (d) Thyristor

**Answer:** C) MOSFET

**2630.** 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

**2631.** 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

**2632.** 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

**2633.** 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

**2634.** 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

**2635.** 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

**2636.** 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

**2637.** 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

**2638.** 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

**2639.** 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

**2640.** 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

**2641.** 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

**2642.** Rectifiers are widely used in:

- (a) Oscillators
- (b) Power supply units
- (c) RF communication
- (d) Audio amplifiers

Answer: B) Power supply units

**2643.** A half-wave rectifier conducts for how much of the input AC cycle?

- (a) 100%
- (b) 50%
- (c) 25%
- (d) 75%

Answer: B) 50%

**2644.** A full-wave bridge rectifier requires how many diodes?

- A) 1
- B) 2
- C) 3
- D) 4

Answer: D) 4

**2645.** 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

**2646.** 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

**2647.** Ripple factor for a full-wave rectifier is approximately:

- (a) 1.21
- (b) 0.482
- (c) 0.707
- (d) 0

Answer: B) 0.482

**2648.** 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%

**2649.** 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

**2650.** 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

**2651.** Which filter type provides the smoothest DC output?

- (a) Capacitor only
- (b) Inductor only
- (c) LC filter
- (d)  $\pi$  (pi) filter

Answer: D)  $\pi$  (pi) filter

**2652.** 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

**2653.** 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

**2654.** 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

**2655.** 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)

**2656.** 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

**2657.** A full-wave rectifier with centre-tap uses how many diodes?

- A) 1
- B) 2
- C) 3
- D) 4

Answer: B) 2

**2658.** 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

**2659.** 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

**2660.** 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

**2661.** 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

**2662.** 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

**2663.** 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

**2664.** 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

**2665.** 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

**2666.** 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

**2667.** The ability of an amplifier to handle different frequencies is termed as amplifiers :

- (a) Distortion
- (b) Linearity
- (c) Bandwidth
- (d) Feedback

**Answer:** C) Bandwidth

**2668.** Which class of amplifier has the lowest efficiency?

- (a) Class A
- (b) Class B
- (c) Class C
- (d) Class D

**Answer:** A) Class A

**2669.** The maximum theoretical efficiency of a Class B amplifier is:

- (a) 25%
- (b) 50%
- (c) 78.5%

- (d) 100%

**Answer:** C) 78.5%

**2670.** 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

**2671.** 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

**2672.** 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

**2673.** Class B amplifiers conduct for how much of the input signal?

- (a)  $90^\circ$
- (b)  $180^\circ$
- (c)  $270^\circ$
- (d)  $360^\circ$

**Answer:** B)  $180^\circ$

**2674.** 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

**2675.** 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

**2676.** 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

**2677.** 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

**2678.** 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

**2679.** 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

**2680.** Class C amplifiers are mainly used for:

- (a) Audio amplification
- (b) RF transmission
- (c) Signal modulation
- (d) Microphone preamps

**Answer:** B) RF transmission

**2681.** 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

**2682.** 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

**2683.** 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%

**2684.** 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

**2685.** The phase shift between input and output in a CE amplifier is:

- (a)  $0^\circ$
- (b)  $90^\circ$
- (c)  $180^\circ$
- (d)  $270^\circ$

**Answer:** C)  $180^\circ$

**2686.** 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

**2687.** The input impedance of a CB amplifier is:

- (a) Very high
- (b) Moderate
- (c) Very low
- (d) Infinite

**Answer:** C) Very low

**2688.** The current gain ( $\beta$ ) in a CB amplifier is approximately:

- (a)  $< 1$
- (b) Equal to 1
- (c) Much greater than 1
- (d) Infinite

**Answer:** A)  $< 1$

**2689.** 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

**2690.** The voltage gain of a CC amplifier is approximately:

- (a)  $> 100$
- (b) 0

- (c) 1
  - (d) Infinity
- Answer: C) 1

**2691.** 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

**2692.** The phase shift between input and output in a CC amplifier is:

- (a)  $0^\circ$
- (b)  $90^\circ$
- (c)  $180^\circ$
- (d)  $360^\circ$

Answer: A)  $0^\circ$

**2693.** Which configuration provides the highest voltage gain?

- (a) CE
- (b) CB
- (c) CC
- (d) None

Answer: A) CE

**2694.** Which configuration has the highest input impedance?

- (a) CB
- (b) CE
- (c) CC
- (d) All equal

Answer: C)

**2695.** 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

**2696.** 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

**2697.** 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

**2698.** 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

**2699.** 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

**2700.** Negative feedback in amplifiers:

- (a) Increases distortion
- (b) Reduces gain
- (c) Reduces bandwidth
- (d) Causes oscillation

**Answer:** B) Reduces gain

**2701.** 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

**2702.** 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

**2703.** 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

**2704.** 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

**2705.** 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

**2706.** 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

**2707.** 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

**2708.** 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

**2709.** The CMRR value for an ideal differential amplifier is:

- (a) 1
- (b) Infinite
- (c) 0
- (d) 100

**Answer:** B) Infinite

**2710.** 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

**2711.** 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

**2712.** 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

**2713.** 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

**2714.** Which of the following uses amplifiers extensively?

- (a) Cooking appliances
- (b) Thermostats
- (c) Audio systems
- (d) Washing machines

**Answer:** C) Audio systems

**2715.** Amplifiers are used in communication systems for:

- (a) Interference
- (b) Attenuation
- (c) Signal boosting
- (d) Filtering only

**Answer:** C) Signal boosting

**2716.** 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

**2717.** 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

**2718.** 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

**2719.** 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

**2720.** 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

**2721.** 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

**2722.** 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

**2723.** 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

**2724.** 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

**2725.** 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

**2726.** 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

**2727.** 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

**2728.** 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.

**2729.** 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

**2730.** According to the **Barkhausen criterion**, the total phase shift around the feedback loop for oscillators must be:

- (a)  $90^\circ$
- (b)  $180^\circ$
- (c)  $360^\circ$  (or  $0^\circ$ )
- (d)  $270^\circ$

Answer: C)  $360^\circ$  (or  $0^\circ$ )

**2731.** 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

**2732.** 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

**2733.** 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

**2734.** 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.

**2735.** The phase shift requirement for a **Wien bridge oscillator** is:

- (a)  $180^\circ$
- (b)  $90^\circ$
- (c)  $360^\circ$  ( $0^\circ$ )
- (d)  $270^\circ$

**Answer:** C)  $360^\circ$  ( $0^\circ$ )

**2736.** 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

**2737.** In a **Colpitts oscillator**, the total phase shift at the frequency of oscillation is:

- (a)  $180^\circ$
- (b)  $360^\circ$
- (c)  $90^\circ$
- (d)  $270^\circ$

**Answer:** B)  $360^\circ$

**2738.** 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

**2739.** 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

**2740.** 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

**2741.** 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

**2742.** 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

**2743.** 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  $180^\circ$
- (d) The frequency of oscillation is determined only by resistors

Answer: C) Requires three RC stages for a total phase shift of  $180^\circ$

**2744.** 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

**2745.** 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

**2746.** 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

**2747.** The condition for sustained oscillations in a Colpitts Oscillator is that the phase shift around the feedback loop must be:

- (a)  $180^\circ$
- (b)  $360^\circ$
- (c)  $90^\circ$
- (d)  $270^\circ$

Answer: B)  $360^\circ$

**2748.** 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

**2749.** The Colpitts oscillator is a type of:

- (a) RC oscillator
- (b) LC oscillator
- (c) Crystal oscillator
- (d) Relaxation oscillator

Answer: B) LC oscillator

**2750.** 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

**2751.** 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

**2752.** The **Hartley Oscillator** is primarily classified as a:

- (a) RC oscillator
- (b) LC oscillator
- (c) Crystal oscillator
- (d) Relaxation oscillator

Answer: B) LC oscillator

**2753.** 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

**2754.** 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

**2755.** 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

**2756.** 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

**2757.** 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

**2758.** 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

**2759.** 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

**2760.** 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



**2761.** 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

**2762.** 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

**2763.** 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

**2764.** 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

**2765.** 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

**2766.** 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

**2767.** 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

**2768.** 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

**2769.** 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

**2770.** 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

**2771.** 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

**2772.** 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

**2773.** 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

**2774.** 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

**2775.** 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

**2776.** 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

**2777.** 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

**2778.** 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

**2779.** 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

**2780.** 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

**2781.** 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) Indeter

minate

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) 0

position  
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 3FFFFH
- c) 0000H to 7FFFFH
- d) 0000H to FFFFFFFH

Answer: b) 0000H to 3FFFFH

**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

### **III. 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

ift

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

s

unstable

Answer

: B

**2963.** The difference between the measured value and the true value is:

- A) Resolution
- B) Drift
- C) Error
- D) Sensi

tivity

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

y

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

base 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) Proporti

onal 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) Pressur

e gauges

Answer: B

**2994.** Reset action is another name for:

- A) Proportional
- B) Integral
- C) Derivative
- D) O

n-off

Answer

: B

**2995.** Which controller provides the most stable control for all process types?

- A) P only
- B) I only
- C) PID
- D) O

n-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) Magn

etic 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

tor

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) Un

defined

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) Thermo

stats

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) Farada

y'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) Alumi

num Answer:

C

**3082.** The resistance of a platinum RTD at 0°C is typically:

- A) 100  $\Omega$
- B) 50  $\Omega$
- C) 10  $\Omega$
- D) 200  $\Omega$

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.** The Seebeck voltage generated by a thermocouple is in the range of:

- A) Volts
- B) Millivolts
- C) Amperes
- D) Ohms

Answer: B

**3094.** 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

**3095.** 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

**3096.** Instrumentation engineers usually deal with:

- A) Digital marketing
- B) Physical parameter measurement (temperature, flow, pressure)
- C) Network design
- D) Welding

schedules Answer: B



**3097.** 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

**3098.** The PI controller eliminates

- a) Overshoot
- b) Stability
- c) Steady-state error
- d) Time delay

Answer: C

**3099.** Which of the following controllers provides anticipatory action?

- a) P
- b) PI
- c) I
- d) D

e) Answer: D

**3100.** 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

**3101.** In field instrumentation, controllers are typically installed in

- a) Software only
- b) Operator panels
- c) Field transmitters or control panels
- d) Actuators

Answer: C

**3102.** In process industries, the most common control loop implemented is

- a) On-Off
- b) P
- c) PID
- d) Manual

Answer: C

**3103.** 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

**3104.** 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

**3105.** Which controller type reacts only to the current error?

- a) PI
- b) P
- c) I
- d) PID

Answer: B

**3106.** Which controller type eliminates steady-state error but may introduce overshoot?

- a) P
- b) D
- c) PI
- d) PD

Answer: C

**3107.** 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

**3108.** 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

**3109.** In PLC programming, PID control is usually implemented through:

- a) Latches
- b) Shift Registers
- c) Function Blocks
- d) Pulse Width Modulation

Answer: C

**3110.** 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

**3111.** 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

**3112.** 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

**3113.** 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

**3114.** 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

**3115.** 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

**3116.** 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

**3117.** 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

**3118.** 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

**3119.** 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

**3120.** 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

**3121.** 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

**3122.** 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

**3123.** 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

**3124.** 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

**3125.** 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

**3126.** 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

Ans

wer

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. RTDs are typically more accurate than:**

- a) Resistors
- b) Relays
- c) Thermocouples**
- d) Batteries
- e) Answer C

**3228. What is a common RTD standard resistance at 0°C?**

- a) 50  $\Omega$
- b) 100  $\Omega$  (PT100)**
- c) 10  $\Omega$
- d) 1 k $\Omega$

Answer  
C

**3229. RTDs are not preferred for:**

- a) Precision measurements
- b) Stability
- c) Very high temperatures (>600°C)**
- d) Repeatability

Answer  
C

**3230. A pyrometer is used for:**

- a) Low voltage measurement
- b) Non-contact temperature measurement**
- c) AC frequency analysis
- d) Humidity detection

Answer B

**3231. Optical pyrometers work by comparing:**

- a) Resistance values
- b) Thermoelectric voltage
- c) Brightness of filament to target**
- d) Sound velocity

Answer C

**3232. Infrared pyrometers detect:**

- a) Sound waves
- b) Thermal radiation from the object**
- c) Pressure pulses
- d) Electric fields

Answer B

**3233. Pyrometers are ideal for measuring temperature of:**

- a) **Moving or inaccessible objects**
  - b) Cold storage units
  - c) RTDs
  - d) Gas flow rate
- Answer A

**3234. 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

**3235. 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

**3236. The pressure drop in a Venturi meter occurs at:**

- a) Inlet
  - b) **Throat section**
  - c) Outlet
  - d) Expansion cone
- Answer B

**3237. 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

**3238. 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

**3239. 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

**3240. An orifice plate measures flow by creating:**

- a) Vibration
  - b) Pressure drop across a restriction**
  - c) Magnetic field
  - d) Thermal change
- Answer B

**3241. 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

**3242. Disadvantage of orifice plate is:**

- a) Simplicity
  - b) High permanent pressure loss**
  - c) Cost
  - d) Linear output
- Answer B

**3243. The orifice plate is placed between:**

- a) Thermocouples
  - b) Flanges**
  - c) Batteries
  - d) Electrical contacts
- Answer B

**3244. Flow through orifice plate is proportional to:**

- a) Area squared
  - b) Pressure
  - c) Square root of differential pressure**
  - d) Temperature
- Answer C

**3245. Rotameter is a type of:**

- a) Variable area flowmeter**
  - b) Fixed-area flowmeter
  - c) Magnetic sensor
  - d) Ultrasonic gauge
- Answer C

**3246. In a rotameter, the float rises when:**

- a) Pressure increases
  - b) Flow rate increases**
  - c) Temperature decreases
  - d) Resistance increases
- Answer B

**3247. 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

**3248. Rotameters are generally mounted:**

- a) Horizontally
- b) Diagonally
- c) Vertically with fluid flowing bottom to top**
- d) Upside-down

Answer C

**3249. Rotameter is not suitable for:**

- a) Measuring air
- b) Opaque or dirty fluids**
- c) Measuring low pressure
- d) Lab-scale flow rates

Answer B

**3250. Electromagnetic flowmeters work on:**

- a) Piezoelectric effect
- b) Faraday's law of electromagnetic induction**
- c) Doppler shift
- d) Capacitance change

Answer B

**3251. Electromagnetic flowmeters can measure:**

- a) Only conductive fluids**
- b) Only gases
- c) Solids and slurries
- d) All types of flows

Answer A

**3252. 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

**3253. 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

**3254. Ultrasonic flowmeters are suitable for:**

- a) Static liquids
- b) Clean or dirty liquids, including slurries**
- c) Solid particles
- d) Magnetic fluids

only Answer B

**3255. 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

**3256. 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

**3257. In a digital recorder, data is recorded as:**

- a) Analog signals
- b) Digital signals (binary data)**
- c) Sound waves
- d) Mechanical movement

Answer B

**3258. 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

**3259. 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

**3260. 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

**3261. 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

**3262. Modern recorders often include:**

- a) Only pens
- b) Only paper rolls
- c) USB data export, memory, and alarms**

- d) Mercury thermometers
- Answer C

**3263. Which component in a strip chart recorder moves to represent the variable?**

- a) Chart paper
  - b) Pen mechanism**
  - c) Thermocouple
  - d) Magnet
- Answer B

**3264. 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

**3265. 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

**3266. Which type of actuator uses compressed air for operation?**

- a) Electric actuator
  - b) Hydraulic actuator
  - c) Pneumatic actuator**
  - d) Piezoelectric actuator
- Answer C

**3267. Electric actuators are commonly used in:**

- a) Manual valves
  - b) Motor-operated valves**
  - c) Magnetic flowmeters
  - d) Fluid level sensing
- Answer B

**3268. 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

**3269. A control valve in a chemical plant is most commonly operated by:**

- a) Thermocouple
  - b) RTD
  - c) Pneumatic actuator**
  - d) Current transformer
- Answer C



**3270. Which actuator type provides the fastest response time?**

- a) Hydraulic
- b) Electric
- c) Pneumatic**
- d) Thermal

Answer C

**3271. The actuator system is generally controlled by a:**

- a) Sensor
- b) Controller (PLC/DCS)**
- c) Motor starter
- d) Battery

Answer B

**3272. Which actuator is most suitable for micro-positioning tasks?**

- a) Pneumatic
- b) Hydraulic
- c) Piezoelectric**
- d) Thermal

Answer C

**3273. An electric actuator converts:**

- a) Thermal energy to motion
- b) Pressure to current
- c) Electrical energy to motion**
- d) Sound to voltage

Answer C

**3274. In HVAC systems, actuators are used to control:**

- a) Sensors
- b) Displays
- c) Air dampers and valves**
- d) Signal conditioning

circuits Answer C

**3275. A thermal actuator typically works on the principle of:**

- a) Magnetism
- b) Thermal expansion of materials**
- c) Electrical resistance
- d) Optical

sensing

Answer B

**3276. 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

**3277. Thermal actuators are commonly used in:**

- a) Audio amplifiers

**b)Thermostatic radiator valves**

c) Electric drives

d) Optical encoders

Answer B

**3278. 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

**3279. 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

**3280. Which characteristic is true for thermal actuators?**

a) Instant response

**b)Slow but smooth motion**

c) High-frequency operation

d) No hysteresis

Answer B

**3281. Thermal actuators are mostly used in:**

a) Digital circuits

**b)Temperature control systems**

c) High-speed robotics

d) Power factor correction

Answer B

**3282. 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

**3283. 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

**3284. 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

**3285. 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

**3286. 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

**3287. The transconductance of a V-I converter is expressed in:**

- a) Ohms
  - b) Volts
  - c) Amps
  - d) Siemens (A/V)**
- Answer D

**3288. A V-I converter with 1 V input and 100  $\Omega$  feedback resistor produces:**

- a) 1 A
  - b) 10 mA**
  - c) 0.1 mA
  - d) 100 A
- Answer B

**3289. 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

**3290. 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

**3291. 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

**3292. An Electro-Pneumatic actuator converts an electrical signal to:**

- a) Voltage output
- b) Pneumatic motion**
- c) Mechanical pressure
- d) Thermal energy

Answer b

**3293. 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

**3294. 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

**3295. 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

**3296. 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

**3297. The device that ensures correct valve position in EP systems is called:**

- a) I/V converter
- b) Amplifier
- c) Positioner**
- d) Rectifier

Answer C

**3298. 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

**3299. EP actuators are classified as:**

- a) Manual control devices
- b) Final control elements**
- c) Primary sensors
- d) Display units

Answer B

**3300. In which environment are EP actuators most beneficial?**

- a) Vacuum
- b) Explosive or flammable areas**
- c) Clean room
- d) High voltage rooms

Answer B

**3301. 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

**3302. 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

**3303. 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

**3304. Which flow transmitter is best suited for conductive fluids?**

- a) Turbine
- b) Electromagnetic**
- c) Ultrasonic
- d) Thermal

Answer b

**3305. Coriolis flow transmitters are mainly used to measure:**

- a) Pressure

**b) Mass flow rate**

c) Level

d) Temperature

Answer B

**3306. 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

**3307. A pressure transmitter converts pressure into:**

a) Frequency

**b) Electrical signal**

c) Voltage fluctuation

d) Mechanical displacement

Answer B

**3308. Gauge pressure is measured relative to:**

a) Vacuum

**b) Atmospheric pressure**

c) Absolute zero

d) Sealed chamber

Answer B

**3309. 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

**3310. 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**

#### **IV. SPECIFIC APPLICATION IN SHOP AREAS :**

**a) Simple block schematic of temperature controls of Axle Shop and Wheel Shop Furnaces**

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 out put 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 Trouble shoot 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
- b) HMI Advance
- c) TIA Portal
- 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. 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 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**

**3390.** 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**

**3391.** 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**

**3392.** 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**

**3393.** 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**

**3394.** 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**

**3395.** The **feedback signal** in this system represents:

- A) Oil pressure
- B) Air speed
- C) Actual furnace temperature
- D) Wheel size

**Correct Answer: C**

**3396.** 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**

**3397.** 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**

**3398.** 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**

**3399.** 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**

**3400.** 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**

**3401.** **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**

**3402.** 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**

**3403.** 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**

**3404.** 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**

**3405.** The **actuator** can be:

- A) Modulating burner
- B) Servo-controlled oil valve
- C) Variable air damper
- D) All of the above

**Correct Answer: D**

**3406.** 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**

**3407.** 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**

**3408.** **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**

**3409.** 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**

**3410.** A **digital temperature controller** typically uses:

- A) Bimetallic strip
- B) Relay logic
- C) Microprocessor-based logic
- D) Magnetic compass

**Correct Answer: C**

**3411.** 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**

**3412.** 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**

**3413.** 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**

#### **b) Operations and controls of EOT Cranes**

**3414.** 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

**3415.** 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

**3416.** 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

**3417.** 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

**3418.** 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

**3419.** 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

**3420.** 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

**3421.** 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

**3422.** 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

**3423.** 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

**3424.** \_\_\_\_\_ is used to douse general fire

- A) Fire extinguisher
- B) Life guard
- C) Alcohol
- D) Air blowing

Ans: A

**3425.** 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

**3426.** 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

**3427.** Total number of EOT cranes in the Axle Forge shop is

- A) 2
- B) 4
- C) 5
- D) 3

Ans: C

**3428.** Total number of EOT cranes in the Axle machine shop is

- A) 2
- B) 4
- C) 3
- D) 5

Ans: B

**3429.** Total number of EOT cranes in the Axle Assembly Bay is

- A) 1
- B) 2
- C) 3
- D) 4

Ans: D

**3430.** Total number of EOT cranes in the Wheelset loading Bay is

- A) 2
- B) 3
- C) 4
- D) 5

Ans: B

**3431.** Total number of EOT cranes in the SPC Bay is

- A) 2
- B) 3
- C) 4
- D) 5

Ans: C

**3432.** 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

**3433.** 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

**3434.** All the Assembly shop cranes are of

- A) 10T
- B) 5T
- C) 15T
- D) 3T

Ans: B

**3435.** Capacity of Axle forge shop cranes is

- A) 5T
- B) 10T
- C) 15T
- D) 20T

Ans: C

**3436.** 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

**3437.** The safety devices of EOT cranes include

- A) Anti Collision device
- B) Rotary switches
- C) Over travel switches
- D) All of these

Ans: D

**3438.** How many corner switches will be there in an EOT crane in general

- A) 1
- B) 2
- C) 4
- D) 3

Ans: C

**3439.** 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

**3440.** 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

**3441.** 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

**3442.** 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

**3443.** 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

**3444.** Rectangular magnet is used in

- A) Axle forge shop
- B) Machine shop
- C) Assembly shop
- D) None of these

Ans: A

**3445.** The capacity of rectangular magnets in the axle forge shop is

- A) 1kw
- B) 2kw
- C) 3kw
- D) 5kw

Ans: B

**3446.** Capacity of circular magnets in the SPC bay is

- A) 15kw
- B) 18.5kw
- C) 20kw
- D) 22.5kw

Ans: B

**3447.** 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

**3448.** 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

**3449.** Capacity of battery bank in the Forge shop cranes are

- A) 110V
- B) 220V
- C) 400V
- D) None of the above

Ans: A

**3450.** Capacity of battery bank in the SPC bay cranes are

- A) 110V
- B) 220V
- C) 400V
- D) None of the above

Ans: B

**3451.** Periodical maintenance of EOT cranes are carried out

- A) monthly
- B) quarterly
- C) half yearly
- D) All of the above

Ans: D

**3452.** 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

**3453.** 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

**3454.** 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

**3455.** 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

**3456.** 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

**3457.** 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

**3458.** Type of motor starter used in the EOT cranes is

- A) DOL
- B) Star delta
- C) VFD
- D) None of the above

Ans: VFD

**3459.** 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

**3460.** 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

**3461.** Full form of VFD is

- A) Voltage Frequency drive
- B) Variable frequency drive
- C) Variable fraction drive
- D) Voltage fixed drive

Ans: B

**3462.** 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

**3463.** Supply to the brake thrusters of an EOT crane is

- A) 415 VAC
- B) 220VAC
- C) 110VAC
- D) 110VDC

Ans: A

**Controls used in important machines like arc furnace, wheel borer, forging M/c and Wheel Casting**

Wheel Borer

**3464.** Table drive for (SMTC) wheel Bore at Assembly shop is

- a) 50 HP DC Motor with Drive
- b) 50 Hp gear AC motor without drive
- c) 50 HP AC Motor with VFD
- d) None of this

Answer: C

**3465.** PLC Controller used in SMTC Wheel Borer is

- a) Allen Bradley SLC500
- b) Allen Bradley SLC 5
- c) Siemens S7 1200
- d) Siemens S7 1500

Answer: A

**3466.** Wheel Seat diameter measured at WSMS station will be accessed by SMTC Wheel Boring station in \_\_\_\_\_ method

- a) LIFO
- b) FIFO
- c) LILO
- d) LIFO

Answer: B

**3467.** Final Wheel Bore Diameter is based on

- a) Initial Wheel Bore Diameter
- b) Wheel seat Diameter of Axle
- c) Interference fit value
- d) All of the above

Answer: D

**3468.** In SMTC Wheel Borer, controller gets current Vertical Ram Position from

- a) Encoder
- b) Linear Scale
- c) Limit Switch
- d) Proximity Switch

Answer: A

**3469.** In SMTC Wheel Borer, control system used for Tool position is

- a) Manual Open loop system
- b) Automatic Open loop system
- c) Closed loop control system
- d) None of the above

Answer: B

**3470.** In SMTC Wheel Borer the tool position (inward & outward) is controlled by

- a) EBB Motor
- b) Tacho generator
- c) Encoder
- d) A, B&C in closed

loop Answer: D

**3471.** After power failure, SMTC Wheel Borer requires calibration of

- a) Vertical Ram
- b) Electronic Boring Bar
- c) A&B
- d) Calibration Not required

Answer: C

**3472.** Wheel Bore (SMTC) communicates with

- a) Press Machine +WPR
- b) Measuring station
- c) Material Handling System
- d) All of the above

**3473.** What means is used for measurement of Wheel seat in SMTC mounting press?

- a) Rotary Encoder
- b) Stepper Motor
- c) Linear Scale
- d) All of

these Answer : C

**3474.** In New Wheel Press Complex commissioned in 2019, Siemens 828D bases CNC control system is used in

- a) Press
- b) Wheel Borers
- c) Measuring Station
- d) Conveyors

Answer : B

3475. Name the PLC Troubleshooting software used in long forging machine?

- a) TIA Software
- b) Step 7
- c) RS Logix
- d) Comp

act Logix

Answer :A

3476. What is the voltage rating of Forging motors in Axle shop?

- a) 6.6 KV
- b) 66 KV
- c) 11 KV
- d) 440 V

Answer : A

3477. In New Wheel Borers (HYT), Vertical ram movement & Horizontal Boring bar movement in controlled using

- a) Servo motors
- b) Servo motors & Hydraulic
- c) Hydraulic only
- d)

Pneumatic Answer: A

3478. PLC Control system used in Long Forging Machine is of\_\_Make

- a) Allen Bradley
- b) Fanuc
- c) Siemens
- d) None of the above

Answer :C

3479. In Old Forge Complex, Full Chuck head's position feed back is given by

- a) Wire rope encoder
- b) Laser Sensor
- c) Proximity Switch
- d) Limit

Switch Answer :A

3480. In New Forge Complex, Full Chuck head's position feed back is given by

- a) Wire rope encoder
- b) Laser Sensor
- c) Proximity Switch
- d) Limit

Switch Answer :B

3481. Old Long Forging Machine have \_\_& \_\_\_\_\_Control systems

- a) CNC & PLC
- b) PLC & SCADA
- c) CNC & DCS
- d) SCADA & DCS

Answer : A

3482. In Long Forging Machine , for proper Forging to happen

- a) Lubrication system should be On
- b) Hydraulic System Should be On
- c) Drives Should be On
- d) All of the Above

Answer : D

3483. In Forging Machine , Scope is recorded for

- a) Analyzing Various Conditions
- b) To reset the machine
- c) To autotune
- d) None of this

Answer : A

3484. In New Forging Machine , \_\_Nos Motors are uses for Forging

- a) 1
- b) 2
- c) 3
- d) 4

Answer : D

3485. Work piece rotation of Axles is done using \_KW Motor

- a) 90
- b) 120
- c) 150
- d) 180

Answer : A

3486. In New Forging Machine , Motors used for forging(hammer) is each of \_\_  
KW

- a) 150
- b) 200
- c) 250
- d) 300

Answer : C

3487. In New Forging Machine(at NAFL Commissioned in 2022) , Each forging  
Motors are of  
\_\_\_\_V

- a) 66000
- b) 6600
- c) 11000
- d) 415

Answer : D

3488. What is the primary function of the thyristor control in an electric arc  
furnace?

- A) Control the arc length
- B) Control the power supply to the furnace
- C) Measure the furnace temperature
- D) Cool the furnace electrodes

**Answer: B**

3489. Which sensor is commonly used to measure the electrode position in an  
arc furnace?

- A) Proximity sensor
- B) LVDT (Linear Variable Differential Transformer)
- C) Thermocouple
- D) Pressure sensor

**Answer: B**

3490. The role of the electrode servo mechanism is to:

- A) Adjust electrode current
- B) Maintain electrode position
- C) Control furnace temperature
- D) Measure power factor

**Answer: B**

3491. What is the typical feedback parameter for controlling furnace power?

- A) Electrode position
- B) Arc voltage and current
- C) Furnace temperature only
- D) Ambient humidity

**Answer: B**

3492. The main safety feature in arc furnace control systems is:

- A) Overcurrent protection
- B) Overvoltage protection
- C) Electrode break detection
- D) Temperature alarms

**Answer: C**

3493. What type of control system is commonly used for electrode regulation?

- A) ON/OFF control
- B) PID control
- C) Manual control
- D) Relay logic control

**Answer: B**

3494. What does SCR stand for in arc furnace power control?

- A) Silicon Controlled Rectifier
- B) Standard Control Relay
- C) Simple Current Regulator
- D) Servo Control Reactor

**Answer: A**

3495. What is the main reason for maintaining proper electrode gap in arc furnace?

- A) To ensure correct arc stability
- B) To cool the furnace
- C) To reduce dust emissions
- D) To increase fuel efficiency

**Answer: A**

3496. Which device is used to measure the current in an arc furnace circuit?

- A) Current transformer (CT)
- B) Thermocouple
- C) Strain gauge
- D) Flow meter

**Answer: A**

3497. What is the purpose of water cooling in arc furnace electrodes?

- A) To cool the molten metal
- B) To prevent electrode overheating
- C) To increase arc length

D) To reduce electrical resistance

**Answer: B**

3498. What kind of power supply is typically used for arc furnaces?

- A) DC supply
- B) Three-phase AC supply
- C) Single-phase AC supply
- D) Battery supply

**Answer: B**

3499. The electrode lift mechanism is usually driven by:

- A) Hydraulic system
- B) Pneumatic system
- C) Electric motor
- D) Manual crank

**Answer: A**

3500. Which parameter is NOT typically monitored in arc furnace operation?

- A) Arc current
- B) Electrode position
- C) Furnace water temperature
- D) Ambient humidity

**Answer: D**

3501. The arc furnace transformer is equipped with a tap changer to:

- A) Adjust output voltage
- B) Cool the transformer
- C) Measure current
- D) Control electrode gap

**Answer: A**

3502. What is the role of the control panel in an arc furnace?

- A) To house controllers, monitors, and operator interfaces
- B) To cool the electrodes
- C) To move the furnace
- D) To melt metal

**Answer: A**

3503. Which of the following protects the furnace from overcurrent?

- A) Circuit breakers
- B) Cooling fans
- C) Voltage regulators
- D) Thermocouples

**Answer: A**

3504. What does the term 'arc stability' refer to?

- A) Consistent arc length and power
- B) Changing arc voltage
- C) Electrode wear rate
- D) Cooling water flow rate

**Answer: A**

3505. Which control element adjusts the arc length in real-time?

- A) Electrode lift servo system



- B) Cooling pump
- C) Transformer tap changer
- D) Temperature controller

**Answer: A**

3506. What device is used for measuring the voltage across arc furnace electrodes?

- A) Potential transformer (PT)
- B) Thermocouple
- C) Pressure sensor
- D) Current transformer

**Answer: A**

3507. How is the arc furnace power factor improved?

- A) By installing capacitors or synchronous condensers
- B) Increasing arc length
- C) Lowering water flow
- D) Reducing electrode diameter

**Answer: A**

3508. The typical arc furnace cycle includes:

- A) Charging, melting, refining, tapping
- B) Heating, cooling, machining
- C) Pouring, drilling, painting
- D) Casting, forging, boring

**Answer: A**

3509. Which instrument is used to measure furnace temperature indirectly?

- A) Infrared pyrometer
- B) Pressure gauge
- C) Thermistor
- D) Tachometer

**Answer: A**

3510. What safety interlock is critical in electrode lift control?

- A) Electrode break detection
- B) Cooling water flow switch
- C) Furnace door sensor
- D) Power supply fuse

**Answer: A**

3511. What does SCR firing angle control affect?

- A) Power delivered to the furnace
- B) Electrode temperature
- C) Cooling water flow
- D) Furnace water level

**Answer: A**

3512. The furnace tap operation is controlled by:

- A) Motorized tap changer mechanism
- B) Manual lever
- C) Hydraulic press
- D) Pneumatic cylinder

**Answer: A**

3513. The function of arc furnace busbars is to:
- A) Conduct high current between transformer and furnace
  - B) Support electrodes
  - C) Cool molten metal
  - D) Measure temperature

**Answer: A**

3514. How is electrode wear detected in arc furnace controls?
- A) Monitoring electrode length and current changes
  - B) Measuring water flow
  - C) Temperature monitoring
  - D) Pressure sensors

**Answer: A**

3515. What is the importance of furnace earthing?
- A) To protect personnel and equipment from electrical faults
  - B) To reduce electrode wear
  - C) To control arc length
  - D) To cool the furnace

**Answer: A**

3516. What happens when the electrode breaks during operation?
- A) Automatic lift-off and shutdown occurs
  - B) Furnace continues normally
  - C) Power increases
  - D) Electrode temperature rises

**Answer: A**

3517. Which PLC function is critical in arc furnace control?
- A) Sequence control and interlocks
  - B) Motor speed control
  - C) Pressure regulation
  - D) Temperature control only

**Answer: A**

3518. What is the role of electrode holders?
- A) To grip and conduct electricity to electrodes
  - B) To cool electrodes
  - C) To regulate furnace power
  - D) To monitor arc voltage

**Answer: A**

3519. Which factor influences the electrode's life the most?
- A) Arc stability and current density
  - B) Cooling water temperature
  - C) Furnace door opening
  - D) Ambient temperature

**Answer: A**

3520. Which instrument provides operator feedback on arc furnace power consumption?
- A) Power analyzer or energy meter

- B) Tachometer
- C) Temperature controller
- D) Pressure gauge

**Answer: A**

3521. How is slag formation monitored in arc furnaces?

- A) By temperature and chemical analysis sensors
- B) Current transformers
- C) Position sensors
- D) Flow meters

**Answer: A**

3522. Which is a common power quality problem in arc furnace operation?

- A) Harmonics in power supply
- B) Excess water flow
- C) Electrode vibration
- D) Low temperature

**Answer: A**

3523. How can arc furnace control systems reduce power consumption?

- A) By optimizing arc length and power factor correction
- B) Increasing electrode size
- C) Reducing water cooling
- D) Increasing furnace ambient temperature

**Answer: A**

3524. What component limits the maximum current in arc furnace?

- A) Current limiting reactors or transformers
- B) Cooling fans
- C) Thermocouples
- D) Busbars

**Answer: A**

3525. Which of these is NOT a control parameter in arc furnace operation?

- A) Electrode gap
- B) Arc voltage
- C) Molten metal viscosity
- D) Arc current

**Answer: C**

3526. What is the primary energy source in an electric arc furnace?

- A) Electric arc between electrodes and scrap metal
- B) Combustion of fuel
- C) Solar power
- D) Hydraulic pressure

**Answer: A**

3527. How is furnace tapping typically automated?

- A) Using motorized tap changer and PLC control
- B) Manual lever operation only
- C) Pneumatic cylinders
- D) By changing electrode current

**Answer: A**

3528. What causes electrode sticking?

- A) Excessive current or arc instability
- B) Low furnace temperature
- C) High water flow
- D) Low ambient humidity

**Answer: A**

3529. What kind of feedback loop is used for electrode position control?

- A) Closed-loop feedback with LVDT and servo motor
- B) Open-loop only
- C) Manual control only
- D) None

**Answer: A**

3530. Which parameter is used to trigger arc furnace power reduction during operation?

- A) Overcurrent or short circuit detection
- B) Temperature only
- C) Ambient humidity
- D) Water pressure

**Answer: A**

3531. What type of cooling is used for arc furnace transformer?

- A) Oil and water cooling
- B) Air cooling only
- C) Fan cooling only
- D) None

**Answer: A**

3532. Which safety feature prevents furnace overheating?

- A) Temperature sensors and alarms
- B) Power meter
- C) Pressure gauges
- D) Flow sensors

**Answer: A**

3533. What is the function of the furnace shell?

- A) To contain molten metal and scrap
- B) To conduct electricity
- C) To cool electrodes
- D) To measure power

**Answer: A**

3534. The control of furnace atmosphere (e.g., inert gas injection) affects:

- A) Metal quality and slag formation
- B) Electrode current
- C) Cooling water flow
- D) Furnace weight

**Answer: A**

3535. What is the main reason for periodic electrode replacement?

- A) Electrode wear and breakage

- B) Furnace temperature rise
- C) Cooling system failure
- D) Power fluctuations

**Answer: A**

3536. What device is used to measure the furnace current waveform?

- A) Current transformer with waveform analyzer
- B) Thermocouple
- C) Pressure sensor
- D) Flow meter

**Answer: A**

3537. Which communication protocol is commonly used for remote arc furnace monitoring?

- A) Modbus or Profibus
- B) Bluetooth only
- C) Wi-Fi only
- D) None

**Answer: A**

3538. What is the primary control parameter in a wheel borer machine?

- A) Spindle speed and feed rate
- B) Furnace temperature
- C) Electrode position
- D) Wheel diameter

**Answer: A**

3539. Which sensor is typically used to detect tool position in a wheel borer?

- A) LVDT
- B) Limit switch
- C) Thermocouple
- D) Pressure sensor

**Answer: B**

3540. The feedback in wheel borer controls is mainly used for:

- A) Monitoring tool wear
- B) Position and speed regulation
- C) Temperature measurement
- D) Electrode adjustment

**Answer: B**

3541. What type of controller is commonly used in CNC wheel borer machines?

- A) PID controller
- B) Relay logic
- C) Manual control
- D) Thermostat

**Answer: A**

3542. The function of coolant system control in wheel borer is to:

- A) Cool the cutting tool and workpiece
- B) Heat the metal
- C) Control wheel rotation
- D) Measure spindle speed

**Answer: A**

3543. **Servo** motor and controller

- B) Thermostat
- C) Limit switch
- D) Pressure valve

**Answer: A**

3544. Which safety device is essential in wheel borer machines?

- A) Emergency stop switch
- B) Furnace temperature alarm
- C) Electrode gap sensor
- D) Cooling water pressure sensor

**Answer: A**

3545. What is the role of spindle drive control?

- A) Regulate the rotational speed of the cutting tool
- B) Control coolant flow
- C) Adjust electrode position
- D) Control furnace temperature

**Answer: A**

3546. What type of feedback is used in spindle speed control?

- A) Tachometer feedback
- B) Pressure sensor feedback
- C) Temperature feedback
- D) Flow meter feedback

**Answer: A**

3547. The axis movement in a wheel borer is usually controlled by:

- A) Hydraulic cylinder
- B) Servo motor and drive
- C) Pneumatic actuator
- D) Manual crank

**Answer: B**

3548. What is the purpose of the tool changer in CNC wheel borer machines?

- A) To automate tool replacement
- B) To cool tools
- C) To measure tool wear
- D) To control spindle speed

**Answer: A**

3549. Which device provides positional accuracy in wheel borer machines?

- A) Encoders
- B) Thermocouples
- C) Pressure sensors
- D) Flow meters

**Answer: A**

3550. The coolant flow rate is typically controlled by:

- A) Flow control valves with feedback
- B) Manual switches only
- C) Temperature sensors

D) Limit switches

**Answer: A**

3551. What is a common cause for vibration in wheel borer operation?

A) Imbalance in spindle or tool

B) Overheating of electrodes

C) Excess coolant flow

D) High furnace temperature

**Answer: A**

3552. What kind of sensors monitor tool wear in advanced wheel borers?

A) Acoustic emission sensors

B) Thermocouples

C) Pressure sensors

D) Flow meters

**Answer: A**

3553. Which control component regulates the speed of the hydraulic actuator in the wheel borer?

A) Proportional valve

B) Limit switch

C) Pressure relief valve

D) Thermostat

**Answer: A**

3554. What does the term “axis backlash” mean in the context of wheel borer controls?

A) Play or looseness in mechanical movement

B) Overheating of motor

C) Excess coolant flow

D) Tool wear rate

**Answer: A**

3555. The operator interface in a CNC wheel borer typically includes:

A) Touchscreen panel with control software

B) Manual switches only

C) Thermostat

D) Pressure gauge

**Answer: A**

3556. What role do limit switches play in wheel borer machines?

A) Detect end of travel to prevent overrun

B) Measure spindle speed

C) Control coolant temperature

D) Monitor hydraulic pressure

**Answer: A**

3557. Which motor type is commonly used for spindle drives in wheel borers?

A) AC induction motor

B) Hydraulic motor

C) Pneumatic motor

D) DC servo motor

**Answer: A**

3558. What is the typical feed mechanism in wheel borers?

- A) Ball screw driven by servo motor
- B) Manual crank
- C) Pneumatic cylinder
- D) Hydraulic ram

**Answer: A**

3559. Which controller is primarily responsible for coordinating multi-axis movements?

- A) CNC controller
- B) PID controller
- C) Relay logic
- D) Thermostat

**Answer: A**

3560. What does “tool offset” refer to in wheel borer CNC programming?

- A) Compensation for tool length or diameter variations
- B) Tool cooling parameters
- C) Spindle speed limits
- D) Hydraulic pressure limits

**Answer: A**

3561. Which type of feedback device measures rotational position of the spindle?

- A) Rotary encoder
- B) LVDT
- C) Thermocouple
- D) Pressure sensor

**Answer: A**

3562. What is the purpose of the spindle brake in wheel borers?

- A) To quickly stop spindle rotation for safety
- B) To start the spindle
- C) To adjust coolant flow
- D) To measure spindle speed

**Answer: A**

3563. What safety measure protects the machine from overload?

- A) Torque sensors or current limiters
- B) Thermocouples
- C) Flow meters
- D) Pressure sensors

**Answer: A**

3564. What is the main advantage of closed-loop control in wheel borers?

- A) Increased accuracy and repeatability
- B) Lower coolant consumption
- C) Reduced spindle speed
- D) Manual operation

**Answer: A**



3565. Which system handles emergency shutdown in wheel borers?

- A) Emergency stop circuits and PLC interlocks
- B) Manual switches only
- C) Thermostats
- D) Pressure valves

**Answer: A**

3566. What role do hydraulic accumulators play in wheel borer control?

- A) Maintain consistent hydraulic pressure
- B) Cool the spindle
- C) Measure feed rate
- D) Adjust spindle speed

**Answer: A**

3567. How is spindle temperature commonly monitored?

- A) Thermocouples or RTDs mounted on spindle housing
- B) Pressure sensors
- C) Flow meters
- D) Limit switches

**Answer: A**

3568. The wheel borer's table movement is controlled by:

- A) Servo motor and linear guide system
- B) Hydraulic ram only
- C) Pneumatic actuator
- D) Manual crank

**Answer: A**

3569. What type of lubrication system is typically used in wheel borers?

- A) Automatic centralized lubrication
- B) Manual oiling
- C) No lubrication needed
- D) Water cooling only

**Answer: A**

3570. How does the machine detect a tool breakage?

- A) Sudden drop in spindle load or acoustic sensors
- B) Thermocouple readings
- C) Pressure fluctuations
- D) Limit switch activation

**Answer: A**

3571. What is the function of the chip conveyor in wheel borers?

- A) Remove metal chips from the work area
- B) Cool the spindle
- C) Measure spindle speed
- D) Control coolant flow

**Answer: A**

3572. Which device measures spindle vibration?

- A) Accelerometer
- B) Thermocouple
- C) Pressure sensor
- D) Flow meter

**Answer: A**

3573. What is the typical voltage supply for wheel borer motors?

- A) 3-phase AC, 415 V
- B) Single-phase AC, 220 V
- C) DC, 24 V
- D) Battery supply

**Answer: A**

3574. How are wheel borer axis movements programmed?

- A) Using G-code in CNC controllers
- B) Manual lever operation
- C) Thermostat settings
- D) Pressure valve adjustments

**Answer: A**

3575. What is the purpose of the spindle speed override control?

- A) Allow operator to adjust speed during operation
- B) Turn off the spindle
- C) Change coolant flow
- D) Stop feed movement

**Answer: A**

3576. Which communication protocol is widely used in CNC wheel borers?

- A) Ethernet/IP or Profibus
- B) Bluetooth only
- C) Wi-Fi only
- D) None

**Answer: A**

3577. What is the effect of backlash in CNC wheel borer axes?

- A) Positional errors and reduced accuracy
- B) Increased spindle speed
- C) Reduced coolant flow
- D) Lower power consumption

**Answer: A**

3578. Which component converts electrical signals into mechanical motion in wheel borer axes?

- A) Servo motor
- B) Thermostat
- C) Pressure valve
- D) Flow meter

**Answer: A**

3579. The spindle speed sensor output is typically:

- A) Digital pulse signal proportional to RPM
- B) Analog voltage proportional to temperature
- C) Pressure reading
- D) Flow measurement

**Answer: A**

3580. What is the typical cycle time controller used in wheel borer CNC machines?

- A) PLC or CNC controller timer
- B) Manual stopwatch
- C) Thermostat timer
- D) Pressure switch timer

**Answer: A**

3581. What is the purpose of the homing cycle in CNC wheel borers?

- A) To establish a known reference position
- B) To start the spindle
- C) To cool the tool
- D) To adjust coolant flow

**Answer: A**

3582. What kind of feedback loop ensures precise tool positioning?

- A) Closed-loop with encoder feedback
- B) Open-loop control
- C) Manual control only
- D) None

**Answer: A**

3583. How is spindle load monitored in wheel borers?

- A) Current sensors on motor supply
- B) Temperature sensors
- C) Pressure sensors
- D) Flow meters

**Answer: A**

3584. What is the purpose of a tool length sensor?

- A) To measure and compensate tool length in programming
- B) To cool the tool
- C) To measure spindle speed
- D) To control coolant flow

**Answer: A**

3585. Which parameter is critical for wheel borer surface finish?

- A) Feed rate and spindle speed
- B) Cooling water pressure
- C) Electrode gap
- D) Furnace temperature

**Answer: A**

3586. How is spindle torque controlled?

- A) By adjusting motor current through drive controllers
- B) Changing coolant flow
- C) Adjusting spindle brake
- D) Manual control only

**Answer: A**

3587. What is the role of servo drive tuning in wheel borers?

- A) To optimize axis response and accuracy
- B) To control coolant flow
- C) To adjust spindle speed
- D) To monitor temperature

**Answer: A**

3588. What is the primary control parameter in forging machines?

- A) Ram position and speed
- B) Electrode gap
- C) Spindle speed
- D) Cooling water flow

**Answer: A**

3589. Which sensor is commonly used to measure ram position in forging machines?

- A) LVDT (Linear Variable Differential Transformer)
- B) Thermocouple
- C) Pressure sensor
- D) Flow meter

**Answer: A**

3590. What type of actuator is generally used to drive the ram in forging presses?

- A) Hydraulic cylinder
- B) Pneumatic cylinder
- C) Electric motor
- D) Manual lever

**Answer: A**

3591. The speed of the ram in forging machines is usually controlled by:

- A) Proportional hydraulic valves
- B) Thermostat
- C) Pressure relief valves
- D) Manual control

**Answer: A**

3592. What is the role of a pressure transducer in a forging machine?

- A) Measure hydraulic pressure in the system
- B) Measure temperature of the workpiece
- C) Measure flow rate of cooling water
- D) Detect tool wear

**Answer: A**

3593. Which control strategy is commonly used for ram position control?

- A) Closed-loop position control using LVDT feedback
- B) Open-loop control only
- C) Manual control without feedback
- D) Thermostat control

**Answer: A**

3594. What safety device prevents ram overtravel?

- A) Limit switches
- B) Thermocouples
- C) Flow meters
- D) Pressure sensors

**Answer: A**

3595. How is forging force monitored?

- A) Using strain gauge load cells
- B) Using thermocouples
- C) Using pressure gauges only
- D) Using flow meters

**Answer: A**

3596. Which type of controller is preferred for hydraulic servo systems in forging presses?

- A) PID controller
- B) Relay logic
- C) Manual switches
- D) Thermostat

**Answer: A**

3597. What is the purpose of a servo valve in forging machine hydraulics?

- A) Precisely regulate hydraulic fluid flow
- B) Measure hydraulic pressure
- C) Detect tool wear
- D) Measure temperature

**Answer: A**

3598. Which component provides feedback on ram velocity?

- A) Differentiated output from LVDT or encoder
- B) Pressure sensor
- C) Thermocouple
- D) Flow meter

**Answer: A**

3599. What does the term "deadband" refer to in forging machine control?

- A) A small range of input where output does not change
- B) Maximum hydraulic pressure
- C) Minimum flow rate
- D) Maximum temperature

**Answer: A**

3600. The forging cycle typically includes:

- A) Ram approach, forging stroke, and return stroke
- B) Cooling only
- C) Electrode gap adjustment
- D) Spindle speed control

**Answer: A**

3601. How is overheating of hydraulic oil prevented?

- A) Using oil coolers and temperature sensors
- B) Using pressure relief valves only
- C) Using limit switches
- D) Manual inspection only

**Answer: A**

3602. What is the function of an accumulator in forging hydraulics?

- A) Store hydraulic energy for quick release
- B) Measure hydraulic pressure
- C) Control coolant flow
- D) Detect ram position

**Answer: A**

3603. Which parameter affects the quality of forged parts most?

- A) Ram speed and force profile
- B) Cooling water flow
- C) Electrode position
- D) Spindle speed

**Answer: A**

3604. How is the forging pressure controlled?

- A) By regulating hydraulic pump output and servo valves
- B) By adjusting coolant flow
- C) By changing spindle speed
- D) Manually only

**Answer: A**

3605. What is the typical power source for forging machine hydraulics?

- A) Electric motor-driven hydraulic pump
- B) Pneumatic compressor
- C) Battery
- D) Manual lever

**Answer: A**

3606. How is the ram speed typically varied during forging?

- A) By changing the servo valve input
- B) By adjusting temperature
- C) By turning a manual knob
- D) By changing spindle speed

**Answer: A**

3607. What is the role of a pressure relief valve in forging hydraulics?

- A) Protect system from excessive pressure
- B) Control ram position
- C) Measure flow rate
- D) Adjust coolant temperature

**Answer: A**

3608. Which sensor type is used to monitor oil temperature in forging machines?

- A) RTD or thermocouple
- B) Pressure sensor
- C) Flow meter

D) Limit switch

**Answer: A**

3609. What type of feedback device is used for measuring angular position of rotary forging machines?

A) Rotary encoder

B) LVDT

C) Thermocouple

D) Pressure sensor

**Answer: A**

3610. How are forging machine control parameters typically programmed?

A) Through PLC or CNC controllers

B) Manual switches only

C) Thermostats

D) Pressure valves

**Answer: A**

3611. What is the purpose of the forging press control interface?

A) Allow operators to set parameters and monitor process

B) Control furnace temperature

C) Measure spindle speed

D) Detect coolant leaks

**Answer: A**

3612. Which device protects the forging machine from hydraulic fluid contamination?

A) Filters and strainers

B) Thermostats

C) Limit switches

D) Pressure relief valves

**Answer: A**

3613. What causes hydraulic system cavitation?

A) Air bubbles or low pressure in fluid

B) Overheating

C) Excess coolant flow

D) Electrical noise

**Answer: A**

3614. What is the primary purpose of the forging machine's return stroke control?

A) Safely retract the ram to start position

B) Increase forging force

C) Adjust spindle speed

D) Control coolant flow

**Answer: A**

3615. Which component controls the flow direction of hydraulic oil?

A) Directional control valve

B) Pressure sensor

C) Temperature sensor

D) Flow meter

**Answer: A**

3616. What is the main cause of forging defects?

- A) Incorrect ram speed and force profile
- B) Improper coolant flow
- C) Electrode misalignment
- D) Low spindle speed

**Answer: A**

3617. What role does a PLC play in forging machine control?

- A) Automates sequence control and interlocks
- B) Measures spindle speed
- C) Controls coolant flow
- D) Detects ram vibration

**Answer: A**

3618. How is system pressure measured in forging hydraulics?

- A) Pressure transducers
- B) Thermocouples
- C) Flow meters
- D) Limit switches

**Answer: A**

3619. What is the function of a servo amplifier in forging controls?

- A) Amplify control signals to servo valves
- B) Measure temperature
- C) Control coolant flow
- D) Measure spindle speed

**Answer: A**

3620. Why is hydraulic oil viscosity important?

- A) Affects system efficiency and component wear
- B) Controls spindle speed
- C) Determines tool wear
- D) Controls coolant temperature

**Answer: A**

3621. What type of maintenance is critical for forging machine hydraulics?

- A) Regular oil analysis and filter changes
- B) Checking spindle bearings only
- C) Cooling system inspection only
- D) Electrical wiring checks only

**Answer: A**

3622. How is forging machine safety ensured?

- A) Emergency stops, overload sensors, and interlocks
- B) Thermostats only
- C) Manual supervision only
- D) Pressure valves only

**Answer: A**

3623. Which device is used to reduce pressure spikes in forging hydraulics?

- A) Accumulator or shock absorber
- B) Thermostat
- C) Flow meter
- D) Limit switch



**Answer: A**

3624. What is the role of software in forging machine control?

- A) Control sequences, monitoring, and diagnostics
- B) Measure coolant flow
- C) Control temperature only
- D) Manual override

**Answer: A**

3625. Which type of control loop regulates ram force?

- A) Closed-loop force control
- B) Open-loop control only
- C) Manual control only
- D) Temperature control loop

**Answer: A**

3626. What is the typical sampling rate for forging control sensors?

- A) High frequency for dynamic control (100 Hz or more)
- B) Low frequency (1 Hz)
- C) Once per hour
- D) Manual readings only

**Answer: A**

3627. How is data from forging machine sensors commonly used?

- A) For process optimization and preventive maintenance
- B) For manual inspection only
- C) For cooling system adjustment only
- D) For spindle speed control only

**Answer: A**

3628. What is “ram dwell time” in forging processes?

- A) Time the ram stays at maximum position under load
- B) Time taken for return stroke
- C) Time for spindle acceleration
- D) Cooling period

**Answer: A**

3629. How is the forging machine’s electrical system protected?

- A) Circuit breakers and overload relays
- B) Pressure valves
- C) Thermostats
- D) Flow meters

**Answer: A**

3630. What is the effect of hydraulic leaks in forging machines?

- A) Loss of pressure and efficiency
- B) Increase in spindle speed
- C) Cooling failure
- D) Tool wear

**Answer: A**

3631. Which device monitors oil level in the forging machine reservoir?

- A) Float switch
- B) Pressure sensor

- C) Thermocouple
- D) Flow meter

**Answer: A**

3632. What is the purpose of interlocks in forging machine control?

- A) Prevent unsafe operations
- B) Measure spindle speed
- C) Control coolant flow
- D) Measure hydraulic temperature

**Answer: A**

3633. How is forging cycle time controlled?

- A) PLC timers and sequence control
- B) Manual stopwatch
- C) Thermostats
- D) Pressure valves

**Answer: A**

3634. What is the role of vibration sensors in forging machines?

- A) Detect abnormal mechanical conditions
- B) Measure coolant flow
- C) Control spindle speed
- D) Detect oil contamination

**Answer: A**

3635. Which maintenance practice prevents forging machine downtime?

- A) Predictive maintenance using sensor data
- B) Random manual checks only
- C) Cooling water flushing only
- D) Spindle lubrication only

**Answer: A**

3636. What is the function of a check valve in forging hydraulics?

- A) Allow flow in one direction only
- B) Measure flow rate
- C) Control temperature
- D) Act as a pressure sensor

**Answer: A**

3637. How is forging machine noise reduced?

- A) Proper hydraulic system design and maintenance
- B) Increasing spindle speed
- C) Reducing coolant flow
- D) Manual operation only

**Answer: A**

3638. What is the primary parameter controlled in wheel casting?

- A) Molten metal temperature
- B) Ram speed
- C) Spindle speed
- D) Electrode gap

**Answer: A**

3639. Which sensor is commonly used to measure molten metal temperature?

- A) Thermocouple
- B) LVDT
- C) Pressure sensor
- D) Flow meter

**Answer: A**

3640. What is the role of a mold temperature controller?

- A) Maintain optimal mold temperature for solidification
- B) Control ram position
- C) Regulate spindle speed
- D) Adjust coolant flow

**Answer: A**

3641. Which device is used to control the pouring rate of molten metal?

- A) Flow control valve
- B) Pressure sensor
- C) Thermostat
- D) Limit switch

**Answer: A**

3642. What type of control system is typically used for pouring rate?

- A) Closed-loop control using flow feedback
- B) Manual control only
- C) Open-loop control without feedback
- D) Temperature-based control only

**Answer: A**

3643. How is the molten metal level monitored in the ladle?

- A) Ultrasonic level sensor
- B) Thermocouple
- C) Pressure sensor
- D) Flow meter

**Answer: A**

3644. What is the main purpose of the casting mold?

- A) Shape and solidify molten metal into wheels
- B) Heat the metal
- C) Measure spindle speed
- D) Control electrode gap

**Answer: A**

3645. Which safety device prevents overflow during pouring?

- A) High-level alarms and interlocks
- B) Thermostats
- C) Limit switches only
- D) Pressure relief valves

**Answer: A**

3646. How is the cooling of the mold controlled?

- A) Water flow rate controllers
- B) Thermostats only
- C) Manual valves only
- D) Hydraulic pressure regulators

**Answer: A**

3647. What is the function of a refractory lining in the furnace?

- A) Protect furnace shell from heat and corrosion
- B) Measure molten metal temperature
- C) Control ram speed
- D) Adjust pouring rate

**Answer: A**

3648. Which parameter affects the quality of wheel casting most?

- A) Pouring temperature and rate
- B) Ram speed
- C) Spindle speed
- D) Electrode position

**Answer: A**

3649. What is the purpose of a vacuum system in wheel casting?

- A) Remove air and gases from the mold to reduce defects
- B) Cool the molten metal
- C) Control electrode gap
- D) Regulate spindle speed

**Answer: A**

3650. Which control device regulates furnace temperature?

- A) PID temperature controller
- B) Pressure sensor
- C) Flow meter
- D) Limit switch

**Answer: A**

3651. How is the molten metal flow rate measured?

- A) Using flowmeters or weight sensors
- B) Using thermocouples
- C) Using pressure gauges
- D) Using limit switches

**Answer: A**

3652. What type of actuator controls the pouring gate?

- A) Hydraulic or electric actuators
- B) Manual levers only
- C) Pneumatic cylinders only
- D) Temperature sensors

**Answer: A**

3653. How is the mold vibration controlled during solidification?

- A) Using vibration controllers to reduce defects
- B) By adjusting spindle speed
- C) By changing coolant flow
- D) Manual shaking only

**Answer: A**

3654. What is the role of the cooling water temperature sensor?

- A) Ensure cooling water is at optimum temperature for mold cooling
- B) Measure molten metal temperature

- C) Control pouring rate
- D) Detect mold defects

**Answer: A**

3655. Which parameter is important for solidification time?

- A) Mold temperature and metal composition
- B) Ram speed
- C) Spindle speed
- D) Electrode gap

**Answer: A**

3656. What is the typical control loop for mold temperature?

- A) Feedback control with thermocouple and PID controller
- B) Manual valve adjustment only
- C) Open-loop control only
- D) Pressure-based control

**Answer: A**

3657. How are impurities removed from molten metal before casting?

- A) Using slag skimmers and filters
- B) By increasing spindle speed
- C) By reducing coolant flow
- D) Manual inspection only

**Answer: A**

3658. What device detects pouring completion?

- A) Level sensors or timers
- B) Pressure sensors
- C) Flow meters
- D) Thermostats

**Answer: A**

3659. How is mold alignment ensured?

- A) Using precise mechanical guides and sensors
- B) Manual alignment only
- C) By adjusting spindle speed
- D) By changing coolant flow

**Answer: A**

3660. What is the function of a ladle furnace in wheel casting?

- A) Maintain molten metal temperature and composition
- B) Measure ram position
- C) Control electrode gap
- D) Regulate spindle speed

**Answer: A**

3661. Which parameter is monitored to prevent mold cracking?

- A) Mold temperature gradient
- B) Spindle speed
- C) Ram speed
- D) Electrode gap

**Answer: A**

3662. What is the role of interlocks in wheel casting controls?

- A) Prevent unsafe pouring operations
- B) Measure spindle speed
- C) Control coolant flow
- D) Detect hydraulic leaks

**Answer: A**

3663. How is the furnace atmosphere controlled?

- A) Using inert gases and ventilation systems
- B) By adjusting spindle speed
- C) By regulating coolant flow
- D) Manual control only

**Answer: A**

3664. Which device controls the speed of the pouring ladle tilting mechanism?

- A) Servo motor with position feedback
- B) Manual lever only
- C) Thermostat
- D) Pressure valve

**Answer: A**

3665. What is the importance of pour duration?

- A) Ensures complete mold filling without turbulence
- B) Controls spindle speed
- C) Adjusts ram position
- D) Measures coolant flow

**Answer: A**

3666. How is molten metal temperature stabilized?

- A) Through controlled heating elements and feedback loops
- B) By changing spindle speed
- C) By manual pouring
- D) By adjusting coolant flow

**Answer: A**

3667. What type of sensor monitors mold strain during casting?

- A) Strain gauge sensors
- B) Thermocouples
- C) Pressure sensors
- D) Flow meters

**Answer: A**

3668. How is casting quality improved through control systems?

- A) By precise regulation of temperature, flow, and mold conditions
- B) By increasing spindle speed
- C) By reducing coolant flow
- D) Manual intervention only

**Answer: A**

3669. What causes porosity defects in wheel casting?

- A) Trapped gases and improper solidification
- B) Incorrect ram speed
- C) Spindle misalignment
- D) Low coolant flow

**Answer: A**

3670. What is the role of a programmable logic controller (PLC) in wheel casting?

- A) Automate process control and safety interlocks
- B) Control spindle speed
- C) Monitor coolant flow only
- D) Measure hydraulic pressure only

**Answer: A**

3671. Which parameter is critical in mold filling velocity?

- A) Pouring rate
- B) Ram speed
- C) Spindle speed
- D) Cooling water temperature

**Answer: A**

3672. How are alarms triggered in wheel casting control systems?

- A) When parameters exceed preset limits
- B) Manually only
- C) At fixed time intervals
- D) By pressure fluctuations only

**Answer: A**

3673. What is the effect of inadequate cooling water flow?

- A) Mold overheating and casting defects
- B) Ram speed fluctuation
- C) Spindle speed variation
- D) Electrode gap issues

**Answer: A**

3674. How is molten metal flow stopped after pouring?

- A) By closing the pouring gate using actuators
- B) Manually tilting ladle back only
- C) Adjusting spindle speed
- D) Changing coolant flow

**Answer: A**

3675. What device monitors the tilt angle of the pouring ladle?

- A) Rotary encoder or inclinometer
- B) Thermocouple
- C) Pressure sensor
- D) Flow meter

**Answer: A**

3676. Which process parameter ensures uniform grain structure in cast wheels?

- A) Controlled cooling rate
- B) Ram speed
- C) Spindle speed
- D) Electrode gap

**Answer: A**

3677. How is mold wear detected?

- A) By dimensional sensors and periodic inspection
- B) Thermocouples only
- C) Pressure sensors only
- D) Flow meters only

**Answer: A**

3678. What is the main cause of cold shuts in wheel casting?

- A) Incomplete mold filling due to low pouring temperature or rate
- B) Excessive ram speed
- C) Incorrect spindle speed
- D) Cooling water temperature

**Answer: A**

3679. Which instrument controls the furnace heating elements?

- A) PID controller
- B) Pressure sensor
- C) Flow meter
- D) Limit switch

**Answer: A**

3680. How is the cleanliness of molten metal ensured?

- A) Through filtration and proper ladle maintenance
- B) By increasing spindle speed
- C) By adjusting coolant flow
- D) Manual pouring only

**Answer: A**

3681. What is the effect of excessive pouring speed?

- A) Turbulence and casting defects
- B) Increased ram speed
- C) Reduced spindle speed
- D) Overcooling of mold

**Answer: A**

3682. How is ladle movement synchronized with pouring controls?

- A) Using coordinated PLC or CNC programming
- B) Manual synchronization only
- C) Thermostats only
- D) Pressure valves only

**Answer: A**

3683. What role does data logging play in wheel casting controls?

- A) Process monitoring and quality analysis
- B) Manual inspection only
- C) Cooling control only
- D) Spindle speed regulation only

**Answer: A**

3684. Which parameter is controlled to avoid hot tears?

- A) Cooling rate and mold temperature
- B) Ram speed
- C) Spindle speed
- D) Electrode gap



**Answer: A**

3685. What type of communication protocol is commonly used in wheel casting control systems?

- A) Modbus or Profibus
- B) Bluetooth only
- C) Infrared only
- D) Manual signals only

**Answer: A**

3686. How is casting cycle time optimized?

- A) By automating pouring, cooling, and solidification controls
- B) Manual timing only
- C) Increasing spindle speed
- D) Reducing coolant flow

**Answer: A**

3687. What is the benefit of integrating SCADA with wheel casting controls?

- A) Real-time monitoring, control, and historical data access
- B) Manual control only
- C) Cooling control only
- D) Spindle speed control only

**Answer: A**

### **PART - III**

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

**3688. What does ISO stand for?**

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

**Answer: C**

**3689. Which of the following ISO series relates to quality management?**

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

**Answer: B**

**3690. ISO 9001 focuses on:**

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

**Answer: C**

**3691. TQM stands for:**

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

D) Total Quick Management

**Answer: C**

**3692. 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**

**3693. The ISO 14000 family relates to:**

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

**Answer: C**

**3694. The first step in ISO 9000 implementation is:**

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

**Answer: C**

**3695. 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**

**3696. Which clause in ISO 9001 deals with customer satisfaction?**

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

**Answer: A**

**3697. Which of these is NOT a principle of TQM?**

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

**Answer: D**

**3698. 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**

**3699. Which year was the ISO 9000 series first introduced?**

- A) 1980
- B) 1987
- C) 1995

D) 2000

**Answer:** B) 1987

**3700. 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

**3701. 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

**3702. 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

**3703. 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

**3704. 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

**3705. 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

**3706. 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

**3707. 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

**3708. 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

**3709. 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

**3710. 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

**3711. 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

**3712. 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

**3713. 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

**3714. 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

**3715. 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

**3716. 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

**3717. 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

**3718. 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

**3719. 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

**3720. 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

**3721. Which document is mandatory for ISO 9001 certification?**

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

**3722. 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

**3723. 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

**3724. 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

**3725. A successful ISO 9001 audit results in:**

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

**Answer:** A) Certification

**3726. 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

**3727. 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

**3728. 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

**3729. 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

**3730. 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

**3731. 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

**3732. 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

**3733. “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

**3734. 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

**3735. ISO 9001 is based on how many quality management principles?**

- A) 5
  - B) 7
  - C) 10
  - D) 12
- Answer:** B) 7

**3736. 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

**3737. 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

**3738. 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

**3739. 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

**3740. 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

**3741. 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

**3742. 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

**3743. 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

**3744. 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



**3745. 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

**3746. 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

**3747. 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

**3748. 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

**3749. 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

**3750. 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%

**3751. 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

**3752. 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

**3753. 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

**3754. 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

**3755. ISO 9000 family deals with:**

- A) Environmental management
  - B) Quality management systems
  - C) Workplace safety
  - D) Inventory optimization
- Answer:** B) Quality management systems

**3756. 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

**3757. 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

**3758. 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

**3759. 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

**3760. TQM was first widely implemented in which country?**

- A) Germany
- B) India

- C) Japan
  - D) USA
- Answer:** C) Japan

**3761. One of the main pillars of TQM is:**

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

**3762. Which ISO standard focuses on energy management?**

- A) ISO 14001
  - B) ISO 9001
  - C) ISO 50001
  - D) ISO 31000
- Answer:** C) ISO 50001

**3763. 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

**3764. Which clause in ISO 9001 refers to "Support"?**

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

**3765. 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

**3766. 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

**3767. 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

**3768. The term Kaizen refers to:**

- A) Major overhaul
- B) Continuous improvement
- C) Redundancy elimination
- D) Supplier rejection

**Answer:** B) Continuous improvement

**3769. 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

**3770. ISO 14000 series primarily targets:**

- A) Employee wages
- B) Product design
- C) Environmental management
- D) Brand recognition

**Answer:** C) Environmental management

**3771. 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

**3772. 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

**3773. 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

**3774. 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

**3775. 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

**3776. Which quality guru is associated with the Deming Cycle (PDCA)?**

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

**Answer:** C) Deming

**3777. 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

**3778. 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

**3779. What tool helps identify root causes of defects?**

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

**3780. ISO 14001 promotes which approach?**

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

**3781. 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

**3782. 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

**3783. 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

**3784. 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

**3785. 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

**3786. 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

**3787. Which clause of ISO 14001 addresses planning?**

A) Clause 3

B) Clause 5

C) Clause 6

D) Clause 4

**Answer:** C) Clause 6

**3788. 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

**3789. The main cause of air pollution is:**

A. Forests

B. Automobiles

C. Solar power

D. Windmills

**Answer:** B. Automobiles

**3790. ISO 14000 series deals with:**

A. Food safety

B. Information security

C. Environmental management

D. Occupational safety

**Answer:** C. Environmental management

**3791. The greenhouse effect is primarily due to increase in:**

A. Ozone

- B. Nitrogen
  - C. Carbon dioxide
  - D. Hydrogen
- Answer:** C. Carbon dioxide

**3792.** Which of the following is not a greenhouse gas?

- A. CO<sub>2</sub>
- B. CH<sub>4</sub>
- C. O<sub>2</sub>
- D. N<sub>2</sub>O

**Answer:** C. O<sub>2</sub>

**3793.** 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)

**3794.** Which is an example of water pollution?

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

**Answer:** B. Oil spill

**3795.** OHSAS 18001 relates to:

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

**Answer:** C. Occupational health and safety

**3796.** Which one of the following is a renewable resource?

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

**Answer:** C. Wind

**3797.** 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

**3798.** 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

**3799.** Noise pollution is measured in:

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

**Answer:** C. Decibels

**3800.** The layer that protects the Earth from harmful UV rays is:

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

**Answer:** C. Ozone

**3801.** 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

**3802.** The ISO 14000 series does NOT include standards for:

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

**Answer:** C. Financial accounting

**3803.** The Kyoto Protocol is related to:

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

**Answer:** B. Environment

**3804.** 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

**3805.** The ISO 14001 certification is valid for:

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

**Answer:** B. 3 years

**3806.** Which of these is considered hazardous waste?

- A. Paper
- B. Plastic
- C. Batteries



D. Wood

**Answer:** C. Batteries

**3807.** 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

**3808.** Which of the following contributes most to acid rain?

- A. CO
- B. SO<sub>2</sub>
- C. H<sub>2</sub>
- D. O<sub>2</sub>

**Answer:** B. SO<sub>2</sub>

**3809.** 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

**3810.** The OHSAS standard that deals with health and safety is:

- A. 14001
- B. 9001
- C. 18001
- D. 50001

**Answer:** C. 18001

**3811.** Which of these gases depletes the ozone layer?

- A. CO<sub>2</sub>
- B. SO<sub>2</sub>
- C. CFCs
- D. O<sub>2</sub>

**Answer:** C. CFCs

**3812.** EMS stands for:

- A. Environmental Management System
- B. Energy Monitoring Setup
- C. Engineering Maintenance System
- D. Earth Monitoring Standards

**Answer:** A. Environmental Management System

**3813.** 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

**3814.** 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

- 3815.** The full form of BOD is:
- A. Biological Oxygen Demand
  - B. Basic Oxide Discharge
  - C. Base Oil Density
  - D. Binary Output Distribution
- Answer:** A

- 3816.** Carbon monoxide is dangerous because it:
- A. Causes water pollution
  - B. Blocks UV rays
  - C. Binds to hemoglobin
  - D. Is visible
- Answer:** C

- 3817.** Environmental impact assessment is done:
- A. Before project approval
  - B. During project execution
  - C. After project completion
  - D. Not required
- Answer:** A

- 3818.** A key benefit of implementing ISO 14001 is:
- A. Increased tax
  - B. Decreased employee performance
  - C. Regulatory compliance
  - D. Higher pollution
- Answer:** C

- 3819.** 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

- 3820.** The primary source of groundwater contamination is:
- A. Pesticides
  - B. UV radiation
  - C. Noise
  - D. Thermal pollution
- Answer:** A

- 3821.** The use of CFCs was banned to prevent:
- A. Soil pollution
  - B. Ozone layer depletion
  - C. Water contamination
  - D. Noise pollution
- Answer:** B

**3822.** Which of the following is an example of renewable energy?

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

**Answer:** B

**3823.** ISO 14001 is specifically designed for:

- A. Government organizations
- B. Environmental management
- C. Product manufacturing
- D. Office administration

**Answer:** B

**3824.** Which of the following pollutants is most commonly associated with urban smog?

- A. CO<sub>2</sub>
- B. Ozone
- C. Nitrogen oxide
- D. Water vapor

**Answer:** B

**3825.** 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

**3826.** 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

**3827.** 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

**3828.** 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

**3829.** The process of converting waste materials into reusable objects is known as:

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

D. Incineration

**Answer: B**

**3830.** 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**

**3831.** Which pollutant is primarily responsible for acid rain?

- A. CO
- B. NO<sub>2</sub>
- C. SO<sub>2</sub>
- D. CO<sub>2</sub>

**Answer: C**

**3832.** A common consequence of deforestation is:

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

**Answer: A**

**3833.** ISO 14000 standards aim to:

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

**Answer: B**

**3834.** 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**

**3835.** 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**

**3836.** Which of the following does not fall under environmental pollution?

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

**Answer: D**

**3837.** 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**

**3838.** 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**

**3839.** Which of the following gases is most responsible for acid rain formation?

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

**Answer: B**

**3840.** Which international agreement aims to reduce greenhouse gas emissions?

- A. Paris Agreement
- B. Kyoto Protocol
- C. Montreal Protocol
- D. Geneva Accord

**Answer: B**

**3841.** Which of these pollutants is the main cause of smog?

- A. Sulfur dioxide
- B. Ozone
- C. Nitrogen oxide
- D. Methane

**Answer: B**

**3842.** 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**

**3843.** Which gas is considered the most significant contributor to global warming?

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

**Answer: B**

**3844.** The major effect of sulfur dioxide emissions is:

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

**Answer: B**

**3845.** The ozone layer primarily protects the Earth from:

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

**Answer:** A

**3846.** The ISO 14000 family of standards is focused on:

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

**Answer:** B

**3847.** Which of the following is not a renewable energy source?

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

**Answer:** C

**3848.** 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

**3849.** Which of the following chemicals contributes most to ozone layer depletion?

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

**Answer:** B

**3850.** ISO 14004 provides guidelines for:

- A. Environmental auditing
- B. General environmental management
- C. Product safety
- D. Greenhouse gas mitigation

**Answer:** B

**3851.** Which of the following is considered a hazardous waste material?

- A. Wood shavings
- B. Paint thinner
- C. Paper
- D. Plastic bottles

**Answer:** B

**3852.** 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**

**3853.** The ozone layer is located in which part of the atmosphere?

- A. Troposphere
- B. Stratosphere
- C. Mesosphere
- D. Thermosphere

**Answer: B**

**3854.** 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**

**3855.** 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**

**3856.** Which of these gases is not harmful to the environment?

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

**Answer: C**

**3857.** Ozone depletion leads to:

- A. Better crop yield
- B. Higher UV radiation
- C. Increased water pollution
- D. Lower global temperatures

**Answer: B**

**3858.** 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**

**3859.** Which of the following is an example of solid waste pollution?

- A. Landfill
- B. Smoke
- C. Acid rain
- D. Water contamination

**Answer: A**

**3860.** 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**

**3861.** 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**

**3862.** 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**

**3863.** What is the full form of CFCs?

- A. Carbonic Fluoride Chemicals
- B. Chlorofluorocarbons
- C. Carbon Fluorocarbon
- D. Chloride Fluorocarbons

**Answer: B**

**3864.** 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**

**3865.** 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**

**3866.** 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**

**3867.** 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**



**3868.** 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

**3869.** The major cause of deforestation is:

- A. Pollution
- B. Urbanization and agriculture
- C. Rainfall patterns
- D. Soil erosion

**Answer:** B

**3870.** ISO 14000 standards aim to reduce:

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

**Answer:** B

**3871.** Which of the following is NOT a greenhouse gas?

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

**Answer:** D

**3872.** 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

**3873.** 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

**3874.** ISO 14004 provides guidelines for:

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

**Answer:** B

**3875.** 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**

**3876.** Which of these gases contributes the most to the formation of smog?

A. Carbon dioxide

B. Nitrogen oxides

C. Ozone

D. Oxygen

**Answer: B**

**3877.** 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**

**3878.** Which of the following materials is most commonly recycled?

A. Metals

B. Plastics

C. Paper

D. Wood

**Answer: C**

**3879.** 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**

**3880.** 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**

**3881.** 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**

**3882.** 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**

**3883.** 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**

**3884.** 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**

**3885.** 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**

**3886.** 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**

**3887.** Which of the following is NOT a principle of ISO 14001?

- A. Environmental protection
- B. Continual improvement
- C. Transparency
- D. Profit maximization

**Answer: D**

**3888. 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**

**3889. 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**

**3890. 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**

**3891. 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**

**3892. 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**

**3893. 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**

**3894. 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**

**3895. 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**

**3896. 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**

**3897. 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**

**3898. 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**

**3899. 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**

**3900. 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**

**3901. 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**

**3902. 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**

**3903. 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**

**3904. 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**

**3905. 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**

**3906. 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**

**3907. 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**

**3908. 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**

**3909. 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**

**3910. 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**

**3911. 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**

**3912. 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**

**3913. 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**

**3914. 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**

**3915. 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%**

**3916. 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**

**3917. 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**

**3918. 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**

**3919. 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**



**3920. 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**

**3921. 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**

**3922. 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**

**3923. 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**

**3924. 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**

**3925. 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**

**3926. 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**

**3927. 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**

**3928. 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**

**3929. 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**

**3930. 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**

**3931. 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**

**3932. 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**

**3933. 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**

**3934. 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**

**3935. 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**

**3936. 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**

**3937. 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**

**3938.** 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

**3939.** Which class of fire involves electrical equipment?

A) Class A

B) Class B

C) Class C

D) Class D

Answer: C) Class C

**3940.** Which type of fire extinguisher is suitable for electrical fires?

A) Water

B) CO<sub>2</sub>

C) Foam

D) Dry powder

Answer: B) CO<sub>2</sub>

**3941.** 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

**3942.** 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

**3943.** 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

**3944.** 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

**3945.** 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

**3946.** 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

above

Answer: A) Accidents requiring a formal inquiry

**3947.** 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

**3948.** What type of extinguisher is NOT used on electrical fires?

- A) CO<sub>2</sub>
- B) Dry Powder
- C) Water
- D) Foam

Answer: C) Water

**3949.** 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

**3950.** 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

**3951.** 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

**3952.** Which type of fire extinguisher is used for Class A fires?

- A) CO<sub>2</sub>
- B) Water
- C) Foam
- D) Dry powder

Answer: B) Water

- 3953.** 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

- 3954.** 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

- 3955.** 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

- 3956.** 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

- 3957.** 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

- 3958.** 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

- 3959.** 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

- 3960.** 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

**3961.** 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

**3962.** 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

**3963.** 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

**3964.** Which of the following is a symptom of hypothermia?

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

Answer: A) Shivering

**3965.** 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

**3966.** 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

**3967.** 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

**3968.** 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

**3969.** 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

**3970.** 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

**3971.** 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

**3972.** 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**

**3973.** Emergency stores should never be classified as -----

(a) Overstock

(b) Inactive

(c) Surplus Stores

(d) All the above

**Ans: (d)**

**3974.** Surplus stores are those stores which are not issued for -----

(a) 36 months

(b) 12 months

(c) 18 months

(d) 24 months

**Ans: (d)**

**3975.** 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)**

**3976.** PL number is -----

- (a) 6 Digits
- (b) 8 Digits
- (c) 10 Digits
- (d) 12 Digits

**Ans: (b)**

**3977.** ABC analysis is also called -----

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

**Ans: (c)**

**3978.** 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)**

**3979.** 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)**

**3980.** 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)**

**3981.** 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)**

**3982.** 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)**

**3983.** 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)**

**3984.** 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)**

**3985.** Major Works in Receipt section -----

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

**Ans: (d)**

**3986.** 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)**

**3987.** 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)**

**3988.** UDM stands for -----

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

**Ans: (a)**

**3989.** 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)**

**3990.** 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)**

**3991.** What is 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)**

**3992.** What does TOR imply -----

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

**Ans: (a)**

**3993.** 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)**

**3994.** Yardsticks of measurement of work in CLW pattern of Incentive Scheme

- (a) StandardProduction Unit
- (b) Time
- (c) SCNCoach
- (d) BOXN Wagon

**Ans: (b)**

**3995.** The yardstick of measurement of work in Group Incentive scheme

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

**Ans: (a)**

**3996.** Minimum percentage of Incentive Bonus in case of CLW pattern incentive scheme

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

**Ans:**  
**(c)**

**3997.** Minimum percentage of Incentive Bonus in case of Group Incentive Scheme

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

**Ans: (b)**

**3998.** Maximum percentage of Incentive Bonus in case of CLW pattern incentive scheme

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

**Ans: (d)**

**3999.** Maximum percentage of Incentive Bonus in case of Group Incentive Scheme

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

**Ans: (d)**

**4000.** 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)**

**4001.** 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)**

**4002.** Stock Sheet is prepared by ASV in -----

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

**Ans: (b)**

**4003.** Accounts Stock verification is in Chapter 32 of -----

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

**Ans: (c)**

**4004.** 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)**

**4005.** 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)**

**4006.** 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)**

**4007.** 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)**

**4008.** \_\_\_\_\_ 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)**

**4009.** If AAC is 3600 Nos, then monthly requirement is -----

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

**Ans: (c)**

**4010.** 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)**

**4011.** 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)**

**4012.** 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)**

**4013.** Track fittings are purchased by Department

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

**Ans: (a)**

**4014.** 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)**

**4015.** 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)**

**4016.** 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) Chief Workshop Engineer – CWE

**Ans: (d)**

**4017.** 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)**

**4018.** 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)**

**4019.** 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)**

**4020.** 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)**

**4021.** Railway Production Units engaged in Rolling Stock manufacturing activity will adopt

- costing system

- (a) Process
- (b) Batch
- (c) Job Order
- (d) Standard

**Ans: (b)**

**4022.** 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**

**4023.** What is the Official Language of the Union of India

- A) Hindi in Devanagari Script**
- B) English Script
- C) Bengali Script
- D) Kashmir

**4024.** 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

**4025.** Which part of the Constitution contains provisions regarding Official Language?

- a. Part XV
- b. Part XVI
- c. Part XVII
- d. Part XVIII**

**4026.** 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

**4027.** How many chapters are there in Part XVII of the Constitution?

- a. 4 Chapters**
- b. 3 Chapters
- c. 2 Chapters
- d. 8 Chapters

**4028.** How many articles are there in Part XVII of the Constitution?

- a. 9 Articles**
- b. 2 Articles
- c. 7 Articles
- d. 1 Articles

**4029.** 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



- 4030.** 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
- 4031.** 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
- 4032.** 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**
- 4033.** 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
- 4034.** 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
- 4035.** 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
- 4036.** 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

**4037.** 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**

**4038.** At present how many languages are enlisted in the Eighth Schedule of the Constitution?

- a. 18
- b. 20
- c. **22**
- d. 25

**4039.** When the Constitution was adopted, how many languages were included in the Eighth Schedule initially?

- a. **Fourteen**
- b. Seventeen
- c. Twelve
- d. D) Sixteen

**4040.** In which year Maithili, Bodo, Dogri and Santhali were added to the Eighth Schedule later?

- a. 2005
- b. **2003**
- c. 2012
- d. 2002

**4041.** In which year Sindhi was added to the Eighth Schedule?

- a. 1956
- b. 1965
- c. **1967**
- d. 1981

**4042.** In which year Nepali, Konkani & Manipuri were added to the 8th Schedule?

- a. 1995
- b. 1989
- c. 1988
- d. **1992**

**4043.** Which one is the foreign language included in the 8th Schedule?

- a. **Nepali**
- b. Bangladesh
- c. Sri Lanka

d. Sindhi

**4044.** Which is the Official Language of Arunachal Pradesh?

- a. Telugu
- b. English**
- c. Marathi
- d. Hindi

**4045.** When was the Official Language Act 1963 passed?

- a. 10.05.1963**
- b. 09.3.1965
- c. 02.08.1988
- d. 11.11.1971

**4046.** 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

**4047.** When was the Official Language Act, 1963 was amended?

- a. 1967**
- b. 1965
- c. 1955
- d. 1985

**4048.** 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**

**4049.** 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

**4050.** 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

**4051.** 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

**4052.** When were Official Languages Rules passed?

- a. 1963
- b. 1968
- c. 1975
- d. 1976**

**4053.** 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

**4054.** Which of the following is a type of misconduct?

- A) Good performance
- B) Unauthorized absence**
- C) Teamwork
- D) Punctuality

**4055.** 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

**4056.** Who is authorized to impose penalties under Discipline and Appeal Rules?

- A) Any employee
- B) Disciplinary authority**
- C) Union representative
- D) Customer

**4057.** 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

**4058.** Which of the following is a minor penalty?

- A) Dismissal
- B) Censure**
- C) Removal
- D) Compulsory retirement

**4059.** 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

**4060.** Who can file an appeal under Discipline and Appeal Rules?

- A) Any employee
- B) Aggrieved employee**
- C) Disciplinary authority
- D) Union representative

**4061.** 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

**4062.** 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

**4063.** Which of the following is a type of disciplinary action?

- A) Promotion
- B) Suspension**
- C) Transfer
- D) Training

**4064.** 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

**4065.** Who can conduct a disciplinary inquiry?

- A) Any employee
- B) Inquiry officer or disciplinary authority**
- C) Union representative
- D) Customer

**4066.** 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

**4067.** Which of the following is a major penalty?

- A) Censure
- B) Removal**
- C) Suspension

D) Warning

**4068.** 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

**4069.** 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

**4070.** 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

**4071.** Who can represent an employee in a disciplinary inquiry?

- A) Any employee
- B) Defense representative or union representative**
- C) Disciplinary authority
- D) Customer

**4072.** 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

**4073.** 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

**4074.** 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

**4075.** The first stage advice of CVC is sought:

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

- 4076.** When can a major penalty be imposed without inquiry?
- a) On minor misconduct
  - b) When employee admits guilt**
  - c) Never
  - d) If department decides
- 4077.** Inquiry officer must submit the report to:
- a) Appellate authority
  - b) Presenting officer
  - c) Complainant
  - d) Disciplinary authority**
- 4078.** Can a government servant withdraw his appeal?
- a) No
  - b) Yes, with approval**
  - c) Yes, anytime
  - d) Only during inquiry
- 4079.** Penalty must be imposed by:
- a) Any officer
  - b) Vigilance
  - c) Disciplinary authority**
  - d) Court
- 4080.** Suspension can be extended:
- a) Indefinitely
  - b) By court order
  - c) With review and reasons**
  - d) On employee's request
- 4081.** When was Official Languages Rules amended?
- a. 1965
  - b. 1987**
  - c. 1970
  - d. 1975
- 4082.** Into how many Regions Indian states have been classified, according to Official Languages Rules?
- a. 1965
  - b. 1987**
  - c. 1970
  - d. 1975
- 4083.** 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

- 4084.** 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
- 4085.** When is "Hindi Day" celebrated every year?
- a. 14th September**
  - b. 15th October
  - c. 6th August
  - d. 17th June
- 4086.** 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
- 4087.** 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
- 4088.** 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
- 4089.** 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
- 4090.** 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

**4091.** According to Official Languages Rules, Tamilnadu falls under which region?

- a. Region A
- b. Region B
- c. **Region C**
- d. Region D

**4092.** According to Official Languages Rules, Andaman & Nicobar Islands fall under which region?

- a. Region A
- b. **Region B**
- c. Region C
- d. Region D

**4093.** 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

**4094.** 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

**4095.** Who was the Chairman of the First Official Language Commission?

- a. Jawaharlal Nehru
- b. **B.G. Kher**
- c. Rajendra Prasad
- d. Morarji Desai

**4096.** 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

**4097.** 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

**4098.** 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

**4099.** 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

**4100.** 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

**4101.** 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

**4102.** 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

**4103.** In which year, Hindi (Parliament) Section was established in Railway Board?

- a. **1960**
- b. 1955
- c. 1957
- d. 1965

**4104.** 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

**4105.** Angami is a language of Goa

- a. Nagaland
- b. Assam**
- c. Bihar
- d. Manipur

**4106.** How many languages and dialects are spoken by people all over the world?

- a. 9000
- b. 6000**
- c. None
- d. 4000

**4107.** Committee on Official Language shall consist \_\_\_\_\_ members of the council of States

- a. Thirty**
- b. Ten
- c. Hundred
- d. Twenty

**4108.** 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

**4109.** Highest speaking language in India after Hindi is

- a. Bengali
- b. Telugu**
- c. Marathi
- d. Tamil

**4110.** The provisions related to official language of India can be amended by

- a. Simple Majority
- b. Special Majority
- c. Presidential Order
- d. Constitutional Amendment**

**4111.** Lepcha is a language of

- a. Sikkim**
- b. Nagaland
- c. Tripura
- d. Andhra Pradesh

**4112.** Name the language that is widely spoken by the people residing in Assam

- a. Gujarati
- b. Punjabi
- c. English
- d. Assamese**

4113. Which one of the following languages is not spoken in Sikkim?
- Bhutia
  - None of these**
  - Lepcha
  - Punjabi
4114. Sherdukpen is a language of
- Bihar
  - Haryana
  - Arunachal Pradesh**
  - West Bengal
4115. What is the additional official language of Uttarakhand?
- Garhwal
  - Sanskrit**
  - Kumaoni
  - Hindi
4116. Approximately, how many people speak Chinese language?
- 1 million
  - 1 billion**
  - 1 thousand
  - 1 lakh
4117. LIPI/Script of Hindi Language is
- Sanskrit
  - Devanagari**
  - Urdu
  - Gurumukhi
4118. In which language vande matram was written?
- Marathi
  - Bengali
  - Hindi
  - Sanskrit**
4119. English is the official language of which one of the following Indian States ?
- Assam
  - Tripura
  - Nagaland**
  - Manipur
4120. Arrange languages in Ascending order of Highest Speaking Language:
- Spanish, English, Russian, Chinese
  - Bengali, French, English, Chinese
  - Arabic, English, Spanish, Chinese
  - Arabic, Spanish, English, Chinese**
4121. When Haryana was formed in 1966, \_\_\_\_\_ was declared as the second official language of the State by Bansi Lal Govt
- Punjabi
  - Telugu
  - Tamil**

- d. Hindi
4122. Which one of the following languages is not widely spoken in Tripura?
- a. English
  - b. Bengali
  - c. Hindi
  - d. **Tripuri**
4123. Sanskrit is official language of the state
- a. Madhya Pradesh
  - b. **Uttarakhand**
  - c. Himachal Pradesh
  - d. Karnataka
4124. Apotanji is a language of
- a. Sikkim
  - b. West Bengal
  - c. Kerala
  - d. **Arunachal Pradesh**
4125. The language spoken in Lakshadweep islands is
- a. Marathi
  - b. Tamil
  - c. **Malayalam**
  - d. Gujarati
4126. While Hindi is the official language, English has been permitted for official use
- a. till 1995
  - b. till 2001
  - c. till 2010
  - d. **Indefinitely**
4127. 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
4128. The only religious book ever printed in a shorthand scripts is
- a. **Bible**
  - b. Ramayan
  - c. Kuran
  - d. Geeta
4129. The oldest Indian language is
- a. **Tamil**
  - b. Telugu
  - c. Punjabi
  - d. Hindi
4130. When was the first time 'World Hindi Day' is observed?
- a. 1975
  - b. **2006**

- c. 2011
- d. 2015

**4131.** 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

**4132.** Konkani is the official language of \_\_\_\_\_.

- a. Andhra Pradesh
- b. Arunachal Pradesh
- c. West Bengal
- d. Goa...**

**4133.** Which of these languages is generally not spoken in Southern part of India?

- a. Telugu
- b. Konkan...
- c. Maithili**
- d. Malayalam...

**4134.** Urdu is the official language of .

- a. Andhra Pradesh
- b. Arunachal Pradesh
- c. West Bengal
- d. Jammu kashmir**

**4135.** Malayalam is the official language of .....

- a. Puducherry
- b. Lakshadweep**
- c. Daman and Diu
- d. Delhi

**4136.** Dzongkha is the official Language of ..... .

- a. Indonesia
- b. Cambodia
- c. Bhutan**
- d. Myanmar.

**4137.** Telugu is the official language of \_\_\_\_\_.

- a. Andhra Pradesh**
- b. Arunachal Pradesh
- c. Assam
- d. Bihar

- 4138.** Ramcharitmanas is an epic poem written in which language?
- Santali
  - Munda
  - Awadhi**
  - Sanskrit
- 4139.** How many languages are officially recognized in India?
- 17
  - 19
  - 22**
  - 10
- 4140.** Who among the following was the first grammarian of the Sanskrit language?
- Kalhana
  - Maitreyi
  - Kalidasa
  - Panini...**
- 4141.** Who will be the President of the Official Language Implementation Committee in the field offices? 'SELF LEARNING KIT' ON OFFICIAL LANGUAGE RULES & PROVISIONS
- Head of the Department**
  - Administrative Head of the Office
  - Any Group Officer
  - Any Branch Officer
- 4142.** Who will be the Member-Secretary of the Official Language Implementation Committee in the field offices?
- Head of the Department
  - Administrative Head of the Office
  - Any Group Officer
  - Hindi Officer**
- 4143.** 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
- English**
  - Hindi
  - Bilingual
  - the Language of State Concerned
- 4144.** 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
- English
  - Hindi**
  - Bilingual

d. the Language of State Concerned

**4145.** 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

**4146.** 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

**4147.** 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

**4148.** 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

**4149.** 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

**4150.** 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**

**4151.** 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

**4152.** 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

**4153.** 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

**4154.** 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

**4155.** 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

**4156.** 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**

**4157.** 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**

**4158.** 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

**4159.** 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

**4160.** 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

**4161.** 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

**4162.** Union Territory of Andaman and Nicobar Islands is under

- a. Region 'A'**
- b. Region 'B'
- c. Region 'C'
- d. Exempted from any Region limits

**4163.** 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

**4164.** 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 .....

- a. 10(1) of OL rules 1976
- b. Rule 10(2) of OL rules 1976
- c. 10(3) of OL rules 1976
- d. 10(4) of OL rules 1976**

**4165.** ..... might be co-opted as Member-Secretary to the Selection/Purchase Committee of the Libraries in the attached and subordinate offices.

- a. Branch Officer
- b. Group Officer
- c. Secretary
- d. Hindi Officer**

**4166.** 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.

- a. Rule 11**
- b. Rule 12
- c. Rule 10
- d. Rule 8

**4167.** As per Section 2 (b) of OL Act 1963 'Hindi' means-

- a. Bhojpuri
- b. Khari Boli
- c. Saurshaini
- d. Hindi in Devanagari Script**

**4168.** The ..... shall be used for purposes of communication between the Union and a State which has not adopted Hindi as its Official Language.

- a. English language**
- b. Hindi language
- c. Urdu language
- d. Concerned State Language

**4169.** From the given below which document is mandatory to be issued both in Hindi and English Language?

- a. General Orders**
- b. Branch Orders
- c. Notes
- d. Letters issued to region area

**4170.** The Committee on Official Language shall consist of

- a. 20 Members
- b. 30 Members**

- c. 40 Members
- d. 50 Members

**4171.** 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**

**4172.** The Committee on Official Language shall consist of ..... Members from Lok Sabha

- a. 10 Members
- b. 15 Members
- c. 20 Members**
- d. 30 Members

**4173.** The Committee on Official Language shall consist of ..... Members from Rajya Sabha

- a. 10 Members**
- b. 15 Members
- c. 20 Members
- d. 30 Members

**4174.** 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

**4175.** 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

**4176.** “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

- 4177.** 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
- 4178.** 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**
- 4179.** 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**
- 4180.** 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**
- 4181.** Directive for development of the Hindi language are mentioned in the Article-
- a. (A) 343
  - b. (B) 345
  - c. (C) 351**
  - d. (D) 365
- 4182.** 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
- 4183.** 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

**4184.** 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**

**4185.** 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

**4186.** "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**

**4187.** 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

**4188.** "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

**4189.** 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
- 148) Which is valid C expression?

**4190.** 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

**4191.** 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

**4192.** 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**

**4193.** 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**

**4194.** 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

**4195.** Which of the following is not a statutory welfare facility as per factories act, 1948

- A. Canteen
- B. Crèches
- C. **Transport**
- D. Drinking water

**4196.** 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**

**4197.** 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

**4198.** 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

**4199.** 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**

**4200.** 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

**4201.** 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

**4202.** 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**



4203. Maximum encashment of leave on average pay is -----.
- A. **300 days**
  - B. 180 days
  - C. 600 days
  - D. 350 days
4204. Attendants of pass holder is
- A. Any person
  - B. Part time servant
  - C. Servant
  - D. **Full time paid servant**
4205. 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
4206. 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
4207. 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
4208. 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
4209. In case of Electric fire we have to use ----- to extinguish
- A. Water
  - B. **Carbon Dioxide**
  - C. Foam
  - D. Sulphur Dioxide
4210. Essential in-direct workers at RWF get ----- % incentive
- A. 100
  - B. 75
  - C. 50
  - D. **80**
4211. Type of incentive followed at RWF is -----.
- A. **Group incentive**
  - B. Individual incentive
  - C. Piece work incentive

- D. None of the above
4212. 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**
4213. ISO 9000 is related to -----  
A. Quantity  
B. **Quality**  
C. Customer satisfaction  
D. Improve safety
4214. 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
4215. Which of the following TQM techniques prescribes 80 / 20 rule?  
A. **Pareto analysis chart**  
B. Pie chart  
C. Fish bone diagram  
D. Histogram
4216. What is TQM  
A. Time and Quality Management  
B. **Total Quality Management**  
C. Total Quantity Management  
D. Time and Quality Manager
4217. 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
4218. 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
4219. While setting quality objective ----- is to be considered  
A. **Customer need**  
B. Organizational need  
C. Supplier need  
D. Employers need
4220. A leader who is honest in speech and upright in character exhibits  
A. Patience  
B. Servant hood

C. **Integrity**

D. Respect

4221. The most dominating cause of environment pollution is -----  
A. Increasing population  
B. **Industrialization**  
C. Use of chemicals in agriculture  
D. None of the above
4222. Which of the following is non-biodegradable  
A. Wool  
B. Animal bones  
C. **Nylon**  
D. Plant leaves
4223. 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
4224. The abbreviation EOQ stands for  
A. Ergonomic office quality  
B. **Economic order quantity**  
C. Environmentally operational quality  
D. Efficient order quantity
4225. “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**
4226. 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
4227. 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**
4228. When was the Official Language rules passed  
A. **1976**  
B. 1945  
C. 1950  
D. 1951
4229. In which order official rubber stamps are to be prepared at RWF  
A. Hindi - Hindi  
B. English - English

C. **Hindi- English**

D. English - Hindi

4230. When is Hindi day celebrated every year

A. **14<sup>th</sup> September**

B. 5<sup>th</sup> June

C. 14<sup>th</sup> November

D. 11<sup>th</sup> September

4231. How many languages are enlisted in the Eighth schedule of the constitution

A. 15

B. 20

C. **22**

D. 35

4232. Which state comes under region 'A'

A. **Rajasthan**

B. Karnataka

C. Kerala

D. Tamilnadu

4233. How many times Hindi exams are conducted in a year

A. One

B. **Two**

C. Four

D. Three

4234. 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

4235. 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

4236. 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

4237. 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

4238. 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
4239. 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
4240. Computers use the ----- language to process data
- A. Processing
  - B. Binary**
  - C. Primary
  - D. Secondary
4241. 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
4242. 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
4243. 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
4244. Maximum encashment of leave on average pay is -----.
- A. 300 days**
  - B. 180 days
  - C. 600 days
  - D. 350 days
4245. Commuted leave is admissible on
- A. Medical certificate**
  - B. Request of an employee
  - C. Discretion of competent authority
  - D. None of the above
4246. 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

4247. 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

4248. Attendants of pass holder is

A. Any person

B. Part time servant

C. Servant

**D. Full time paid servant**

4249. 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

4250. 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

4251. 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**

4252. 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

4253. 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

4254. 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

4255. "Censure" is a \_\_\_\_\_  
A. Major penalty  
**B. Minor penalty**  
C. Both  
D. None of the above
4256. 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**
4257. 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**
4258. Decibel (db) is a unit used to measure  
A. Light  
**B. Sound**  
C. Frequency  
D. None of the above
4259. 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
4260. 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
4261. A work order shall have \_\_\_\_\_ character alpha numeric code  
A. Five  
B. Two  
C. Three  
**D. Four**
4262. First digit of the work order represents the \_\_\_\_\_  
A. Month  
**B. Year**  
C. Shop  
D. Product
4263. 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**

4264. 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**
4265. According to Official Language Rule, Karnataka falls under which region
- A. Region A
  - B. Region B
  - C. Region C**
  - D. Region D
4266. Which is the elementary course prescribed for Central Government employees
- A. Prabod**
  - B. Praveen
  - C. Pragya
  - D. None of the above
4267. In which order official rubber stamps are to be prepared at RWF
- A. Hindi - Hindi
  - B. English - English
  - C. Hindi - English**
  - D. English - Hindi
4268. Which state comes under region 'A'
- A. Rajasthan**
  - B. Karnataka
  - C. Kerala
  - D. Tamilnadu
4269. How many Hindi courses are prescribed for Central Govt Employees?
- A. One
  - B. Four**
  - C. Six
  - D. Five
4270. 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
4271. Which of the following is for Environment management?
- A. ISO-14001**
  - B. ISO-9000
  - C. ISO-27000
  - D. ISO-50000
4272. 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



4273. 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
4274. 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
4275. 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
4276. 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)**
4277. "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
4278. 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

- 4279.** 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
- 4280.** 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**
- 4281.** 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
- 4282.** 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
- 4283.** 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**
- 4284.** 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.

- 4285.** 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**
- 4286.** 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
- 4287.** 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**
- 4288.** 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
- 4289.** Employees' share of contribution under the ESI Act is
- A. 12%
  - B. 8.33%
  - C. 0.75%**
  - D. 4.75%
- 4290.** The employer's share of contribution under the ESI Act is
- A. 12%
  - B. 8.33%
  - C. 1.75%
  - D. 3.25%**
- 4291.** Employees' share of provident fund contribution is
- A. 12%**
  - B. 8.33%
  - C. 1.75%
  - D. 4.75%