

ELECTRICAL DEPARTMENT

QUESTION BANK FOR APPOINTMENT TO THE POST OF JE'S

ON COMPASSIONATE GROUNDS

(ALONG WITH KEY)

1. One commercial unit of energy equals (C)
(a) 500 watt-seconds (b) one watt-hour
(c) One kilowatt-hour (d) ten kilowatt-hour
2. The electrical energy required to heat a bucket of water to a certain temperature is 4 kWh. If the heat losses are 20 percent, the energy input is (C)
(a) 2 kWh (b) 3.2 kWh
(c) 5 kWh (d) 6 kWh
3. The maximum current rating for a 10k Ω , 0.5 W resistor is (B)
(a) 0.707 mA **(b)** 7.07 mA
(c) 14.14 mA (d) 28.28 mA
4. The substances which have a large number of free electrons and offer a low resistance are called (D)
(a) Insulators (b) inductors
(c) Semi-conductors **(d)** conductors
5. The resistance of a conductor varies inversely as (B)
(a) length **(b)** area of cross-section
(c) temperature (d) resistivity
6. With rise in temperature the resistance of pure metals (A)
(a) Increases (b) decreases
(c) first increases and then decreases (d) remains constant
7. The resistance of a copper wire 200 m long is 21 Ω . If its thickness (diameter) is 0.44 mm, its specific resistance is around (C)
(a) $1.2 \times 10^{-8} \Omega\text{-m}$ (b) $1.4 \times 10^{-8} \Omega\text{-m}$
(c) $1.6 \times 10^{-8} \Omega\text{-m}$ (d) $1.8 \times 10^{-8} \Omega\text{-m}$
8. Three resistances of 10 ohms, 15 ohms and 30 ohms are connected in parallel. The total resistance of the combination is (A)
(a) 5 ohms (b) 10 ohms
(c) 15 ohms (d) 55 ohms
9. The resistance of two wires is 25 Ω when connected in series and 6 Ω when joined in parallel. The resistance of each wire is (A)
(a) 10 Ω , 15 Ω (b) 20 Ω , 30 Ω
(c) 5 Ω , 10 Ω (d) 10 Ω , 20 Ω
10. An instrument which detects electric current is known as (D)
(a) Voltmeter (b) rheostat
(c) wattmeter **(d)** galvanometer

11. The resistance of a parallel circuit consisting of two branches is 12 ohms. If the resistance of one branch is 18 ohms, what is the resistance of the other ? (B)
 (a) 18 Ω (b) 36 Ω
 (c) 48 Ω (d) 64 Ω
12. Four wires of same material, the same cross-sectional area and the same length when connected in parallel give a resistance of 0.25 Ω . If the same four wires are connected in series the effective resistance will be (D)
 (a) 1 Ω (b) 2 Ω
 (c) 3 Ω (d) 4 Ω
13. Which of the following materials has a negative temperature co-efficient of resistance? (C)
 (a) Copper (b) Aluminum
 (c) Carbon (d) Brass
14. Which of the following statement is true? (C)
 (a) A galvanometer with low resistance in parallel is a voltmeter
 (b) A galvanometer with high resistance in parallel is a voltmeter
 (c) A galvanometer with low resistance in series is an ammeter
 (d) A galvanometer with high resistance in series is an ammeter
15. A closed switch has a resistance of (A)
 (a) Zero (b) about 50 ohms
 (c) about 500 ohms (d) infinity
16. The thickness of insulation provided on the conductor depends on (A)
 (a) The magnitude of voltage on the conductor
 (b) The magnitude of current flowing through it
 (c) Both (a) and (b)
 (d) None of the above
17. Which of the following quantities remain the same in all parts of a series circuit? (B)
 (a) Voltage (b) Current
 (c) Power (d) Resistance
18. In an electric kettle water boils in 10 minutes. It is required to boil the boiler in 15 minutes, using same supply mains (A)
 (a) Length of heating element should be decreased
 (b) Length of heating element should be increased
 (c) Length of heating element has no effect on heating of water
 (d) None of the above
19. Bulbs in street lighting are all connected in (A)
 (a) Parallel (b) series
 (c) series-parallel (d) end-to-end
20. Sparking occurs when a load is switched off because the circuit has high (B)
 (a) Resistance (b) inductance
 (c) capacitance (d) impedance

21. Which of the following relation is incorrect (C)
 (a) $P = VI$ (b) $P = I^2 R$
 (c) $P = V/R^2$ (d) $P = V^2/R$
22. If I, R and t are the current, resistance and time respectively, then according to Joule's law heat produced will be proportional to (A)
 (a) $I^2 R t$ (b) $I^2 R t^2$
 (c) $I^2 R^2 t$ (d) $I^2 R^2 t^2$
23. When a low resistance is connected in parallel with a high resistance, the combined resistance is (B)
 (a) always more than the high resistance (b) always less than the low resistance
 (c) always between the value of high and low resistance
 (d) either lower or higher than low resistance depending on the value of high resistance
24. Two 100 W, 200 V lamps are connected in series across a 200 V supply. The total power consumed by each lamp will be watts. (A)
 (a) 25 (b) 50
 (c) 100 (d) 200
25. The factor which will have least effect on the voltage at the load end of a two-wire supply circuit is (B)
 (a) length of the circuit (b) whether supply frequency is 25 Hz or 50 Hz
 (c) amount of load on the circuit (d) cross section of the current wires
26. For a given line voltage, four heating coils will produce maximum heat when connected (A)
 (a) all in parallel (b) all in series
 (c) with two parallel pairs in series (d) on pair in parallel with the other two in series
27. For current to flow, a circuit must be (C)
 (a) Isolated (b) insulated
 (c) complete (d) protected
28. If a 'live' conductor of a public supply touches earth metal (D)
 (a) supply voltage will increase (b) supply voltage will decrease
 (c) no current will flow (d) current will flow to earth
29. The material used for fuse must have (B)
 (a) Low melting point and low specific resistance
 (b) Low melting point and high specific resistance
 (c) High melting point and low specific resistance
30. Which of the following statements regarding a capacitor is not true? (D)
 (a) dc cannot flow through it (b) ac can flow 'through' it
 (c) current flows when a capacitor is connected for the first time across a battery
 (d) slight moisture increases its capacitance
31. A 'short circuit' is that which (D)
 (a) uses short pieces of wire (b) goes only a short distance
 (c) is used for dimming light (d) offers very low resistance path for current to flow

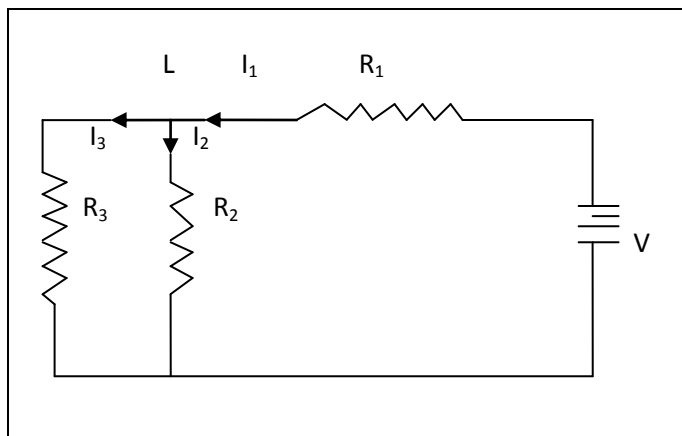
32. Which of the following stays the same in all parts of a series circuit? (D)
 (a) Voltage (b) power
 (c) resistance **(d) current**
33. The resistance of the windings of a generator is known as (C)
 (a) generated resistance (b) field resistance
(c) internal resistance (d) terminal resistance
34. Ohm's law is applicable to (D)
 (a) Semi-conductors (b) vacuum tubes
 (c) electrolytes **(d) none of these**
35. A wire of length l of circular cross section of radius r has a resistance of R ohms. Another wire of same material and a cross sectional radius $2r$ will have the same resistance R if the length is (C)
 (a) $2l$ (b) $l/2$
(c) $4l$ (d) $l/2$
36. With the rise in temperature, the temperature coefficient of resistance (C)
 (a) remains unaffected (b) increases
(c) decreases (d) uncertain
37. The values of temperature coefficient of resistance of a given conductor are' (C)
 (a) the same at different temperatures (b) higher at higher temperatures
(c) different at different temperatures (d) none of the above
38. Temperature coefficient of resistance is defined as (A)
(a) increase in resistance per ohm per $^{\circ}\text{C}$ (b) increase in resistance per $^{\circ}\text{C}$
 (c) decrease in resistance per ohm per $^{\circ}\text{C}$
 (d) the ratio of decrease in resistance per $^{\circ}\text{C}$ to the resistance at 0°C
39. The resistance of a parallel circuit consisting of two resistors is 12Ω . One of the resistance wires breaks and the effective resistance becomes 18Ω . The resistance of the broken wire is (C)
 (a) 48Ω (b) 18Ω
(c) 36Ω (d) 24Ω
40. When one leg of a parallel circuit gets opened out, the current drawn from the supply will (A)
(a) reduce (b) increase
 (c) remain the same (d) uncertain
41. For a series as well as a parallel circuit (B)
 (a) resistance's are additive **(b) powers are additive**
 (c) currents are additive (d) voltage drops are additive
42. A 100 W bulb is connected in series with a room heater. If now 100 W bulb is replaced by a 400 W bulb, the heater output will (B)
 (a) Increase **(b) decrease**
 (c) remain same (d) uncertain
43. An ideal voltage source should have (A)
(a) zero source resistance (b) infinite source resistance
 (c) terminal voltage in proportion to current (d) terminal voltage in proportion to load

44. For a voltage source, terminal voltage (B)
 (a) is equal to a source emf (b) cannot exceed source emf
 (c) is always lower than source emf (d) is higher than the source emf
45. An active element is (C)
 (a) Resistance (b) Inductor
 (c) current source (d) all of these
46. The elements which are not capable of delivering energy by its own are known as (C)
 (a) unilateral elements (b) non-linear elements
 (c) passive elements (d) active elements
47. A circuit having neither any energy source nor emf source is called the (C)
 (a) unilateral circuit (b) bilateral circuit
 (c) passive circuit (d) active circuit
48. A terminal where more than two branches meet is known as (A)
 (a) node (b) terminus
 (c) anode (d) none of these
49. A closed path made by several branches of the network is known as (B)
 (a) circuit (b) loop
 (c) junction (d) branch
50. If there are e elements and n nodes, the number of meshes will be (D)
 (a) $n-1$ (b) e
 (c) $e-n$ (d) $(e-n) + 1$
51. If there are b branches and j Junction the number of meshes will be (D)
 (a) $b-1$ (b) b
 (c) $b-j$ (d) $(b-j) + 1$
52. Kirchhoff's laws are valid for (D)
 (a) linear circuit only (b) passive time invariant circuits
 (c) non-linear circuits only (d) both linear and non-linear circuits
53. Kirchhoff's voltage law is concerned with (C)
 (a) IR drops (b) battery emfs
 (c) both (a) and (b) above (d) none of the above
54. The nodal analysis is primarily based on the application of (D)
 (a) Ohm's law (b) Kirchhoff's current law
 (c) both (a) and (b) above (d) none of the above
55. The value of electric field intensity within the field due to a point charge can be determined by (C)
 (a) Gauss's law (b) Ampere's law
 (c) Coulomb's law (d) Maxwell's law
56. Space surrounding a charge, within which the influence of its charge extends is known as (A)
 (a) electric field (b) magnetic field
 (c) lines of force (d) electric intensity

57. Which of the following is a scalar quantity ? (C)
 (a) Electric field strength (b) Electric displacement density
☒ (c) Electric potential (d) Force
58. Lines of force (A)
☒ (a) never intersect (b) often intersect
 (c) intersect only in special circumstances (d) are unpredictable
59. Principle of dynamically induced emf is used in a (C)
 (a) Choke (b) transformer
☒ (c) generator (d) thermo-couple
60. Principle of statically induced emf is used in (A)
☒ (a) transformer (b) motor
 (c) generator (d) battery
61. The property of a coil by which a counter emf is induced in it, when the current through the coil changes, is known as (A)
☒ (a) self inductance (b) mutual induction
 (c) capacitance (d) none of these
62. The mutual inductance between two closely coupled coils is 1 H. Now the turns of one coil are decreased to half and those of the other are doubled. The new value of mutual inductance would be (D)
 (a) 2 H (b) $\frac{1}{2} H$
☒ (d) 1 H (c) $\frac{1}{4} H$
63. The coils having self inductance of 10 mH and 15 mH and effective inductance of 40 mH, when connected in series aiding. What will be the equivalent inductance if we connect them in series opposing? (B)
☒ (b) 10 mH
 (a) 20 mH (c) 5 mH (d) zero
64. Magnetic saturation of iron means (D)
 (a) the state when changes in magnetic field strength H causes a little change in the magnetic flux density B.
 (b) the state when a little change in magnetic field strength H causes a larger change in the magnetic flux density
 (c) magnetization of iron to the maximum extent
☒ (d) none of the above
65. The energy stored in the magnetic field of a solenoid 30 cm. long and 3 cm diameter would with 1,000 turns of wire carrying current of 10 A is (B)
☒ (b) 0.15 J
 (a) 0.015 J (c) 0.5 J (d) 1.15 J
66. Resistance of earth should be (D)
 (a) Infinite (b) high
☒ (d) the minimum possible
 (c) low

67. An alternating current of frequency 50 Hz and maximum value 200 A given as (B)
 (a) $i = 200 \sin 628 t$ (b) $i = 200 \sin 314 t$
 (c) $i = 100\sqrt{2} \sin 314 t$ (d) $i = 100\sqrt{2} \sin 157 t$
68. A sine wave has a frequency of 50 Hz. Its angular frequency will be (C)
 (a) $\frac{50}{\pi} \text{ radians/sec}$ (b) $50 \pi \text{ radians/sec}$
 (c) $100\pi \text{ radians/sec}$ (d) $\frac{100}{\pi} \text{ radians/sec}$
69. The time period of an alternating quantity is 0.02 second. Its frequency will be (B)
 (a) 25 Hz (b) 50 Hz
 (c) 100 Hz (d) 0.02 Hz
70. Form factor is the ratio of (B)
 (a) average value to rms value (b) rms value to average value
 (c) peak value to average value (d) peak value to rms value
71. Peak factor is the ratio of (D)
 (a) average value to rms value (b) rms value to average value
 (c) peak value to average value (d) peak value to rms value
72. Form factor for dc supply voltage is always (B)
 (a) Zero (b) unity
 (c) infinity (d) any value between 0 and 1
73. The two quantities are said to be in phase with each other when (C)
 (a) the phase difference between two quantities is zero degree or radian
 (b) each of them passes through zero values at the same instant and rises in the same direction
 (c) both (a) and (b) above
 (d) none of the above
74. A phasor is a line which represents the (A)
 (a) rms value and phase of an alternating quantity
 (b) average value and phase of an alternating quantity
 (c) magnitude and direction of an alternating quantity
 (d) none of these
75. Two alternating quantities are added (C)
 (a) Arithmetically (b) graphically
 (c) vectorially (d) geometrically
76. A 24 V battery of internal resistance $r=4 \text{ ohm}$ connected to a variable resistance R. The rate of heat dissipated in the resistor is maximum when the current drawn from the battery is I. The current drawn from the battery will be $\frac{1}{2}$ when R is equal to (B)
 (a) 8 ohm (b) 12 ohm
 (c) 16 ohm (d) 20 ohm
77. Two wires A and B of the same material and length L and 2L have radius r and 2r, respectively. The ratio of their specific resistance will be (B)
 (a) 1 : 1 (b) 1 : 2
 (c) 1 : 4 (d) 1 : 8

78. Two incandescent light bulbs of 40 W and 60W rating are connected in series across the mains. Then (D)
 (a) The bulbs together consume 100 W (b) the bulbs together consumer 50 W
 (c) the 60 W bulb glows brighter (d) the 40 W bulb glows brighter
79. The rated voltage of a 3-phase power system is given as (C)
 (a) rms phase voltage (b) peak value voltage
 (c) rms line to line voltage (d) peak line to line voltage
80. One newton metre is same as (B)
 (a) One watt (b) one joule
 (c) five joules (d) one joule second
81. Kirchhoff's current law is applicable to only (A)
 (a) Junction in a network (b) closed loops in a network
 (c) electric circuits (d) electronic circuits
82. An ideal voltage source should have (C)
 (a) Large value of e.m.f (b) small value of e.m.f.
 (c) zero source resistance (d) infinite source resistance
83. For maximum transfer of power, internal resistance of the source should be (A)
 (a) Equal to load resistance (b) less than the load resistance
 (c) greater than the load resistance (d) none of the above
84. In the given circuit, the Kirchhoff's current law at the point L is applied. Which of the following relation is correct? (A)



- (a) $I_1 - (I_2 + I_3) = 0$ (b) $I_1 = I_2 - I_3$
 (c) $I_1 + I_2 - I_3 = 0$ (d) $I_1 + I_2 + I_3 = 0$
85. If a circuit does not contain any source of energy or e.m.f. it is known as (C)
 (a) Unilateral circuit (b) bilateral circuit
 (c) passive network (d) active network

86. A terminal where three or more branches meet is known as (A)
 (a) Node (b) terminus
 (c) combination (d) anode
87. The mass of an electron is equal to (B)
 (a) 1.602×10^{-19} kg (b) 9.11×10^{-31} kg
 (c) 1.673×10^{-27} kg (d) 9.11×10^{-20} kg
88. As per Coulomb's law (C)
 (a) $F = \frac{Q_1 Q_2}{\epsilon_0 \epsilon_r d^2}$ (b) $F = \frac{Q_1 Q_2}{4\pi d^2}$
 (c) $F = \frac{Q_1 Q_2}{4\pi \epsilon_0 \epsilon_r d^2}$ (d) $F = \frac{Q_1 Q_2}{4\pi \epsilon_0 \epsilon_r d}$
89. If the sheet of a Bakelite is inserted between the plates of an air capacitor, the capacitance will (B)
 (a) Decrease (b) increase
 (c) remains unchanged (d) become zero
90. A capacitor stores 0.24 coulombs at 10 volts. Its capacitance is (A)
 (a) 0.024 F (b) 0.12 F
 (c) 0.6 F (d) 0.8 F
91. If three $15\mu\text{F}$ capacitors are connected in series, the net capacitance is (A)
 (a) $5\mu\text{F}$ (b) $30\mu\text{F}$
 (c) $45\mu\text{F}$ (d) $50\mu\text{F}$
92. A dielectric material must be (B)
 (a) Resistor (b) insulator
 (c) Good conductor (d) semi conductor
93. In a capacitor the electric charge is stored in (B)
 (a) Metal plates (b) dielectric
 (c) both (a) and (b) (d) none of the above
94. The power dissipated in a pure capacitor is (A)
 (a) Zero (b) proportional to applied voltage
 (c) proportional to value of capacitance (d) both (b) and (c) above
95. The unit of capacitance is (C)
 (a) henry (b) ohm
 (c) farad (d) farad/m
96. Energy stored in the electric field of a capacitor C when charged from a D.C source of voltage V is equal to joules (A)
 (a) $\frac{1}{2} CV^2$ (b) $\frac{1}{2} C^2 V$
 (c) CV^2 (d) $C^2 V$
97. The capacity of capacitor bank used in power factor correction is expressed in terms of (C)
 (a) kW (b) Kva
 (c) kVAR (d) volts

98. The potential of the sphere is given by (B)
- (a) $\frac{Q^2}{4\pi\epsilon_0 r}$ (b) $\frac{Q}{4\pi\epsilon_0 r}$
 (c) $\frac{Q}{\pi\epsilon_0 r}$ (d) $\frac{Q}{8\pi\epsilon_0 r^2}$
99. A unit tube of flux is known as tube (B)
- (a) Newton (b) Faraday
 (c) Michale (d) none of the above
100. The property of a capacitor to store electricity is called its (A)
- (a) Capacitance (b) charge
 (c) Energy (d) none of the above
101. One volt is the same as (A)
- (a) One joule/coulomb (b) one coulomb/joule
 (c) one coulomb (d) one joule
102. The capacitance C is charged through a resistance R. The time constant of the charging circuit is given by (C)
- (a) C/R (b) 1/RC
 (c) RC (d) R/C
103. Dielectric strength of a medium is usually expressed in (C)
- (a) J/mm (b) C/m²
 (c) kV/mm (d) N/mm
104. If Q and C be the charge and capacity of a condenser, then the energy stored in the capacitor is given by (C)
- (a) $\frac{1}{2} C^2 Q$ (b) $\frac{1}{2} Q^2 / C^2$
 (c) $\frac{1}{2} Q^2 / C$ (d) $\frac{1}{2} C^2 / Q^2$
105. The electrons, in a dielectric , get detached from the atoms under (D)
- (a) high current (b) high voltage
 (c) variable current (d) breakdown
106. Tesla is a unit of (C)
- (a) Field strength (b) inductance
 (c) flux density (d) flux
107. The direction of magnetic lines of force is (B)
- (a) from south pole to north pole (b) from north pole to south pole
 (c) from one end of the magnet to another (d) none of the above
108. The two conductors of a transmission line carry equal current I in opposite directions. The force on each conductor is (B)
- (a) Proportional to I (b) proportional to I²
 (c) proportional to distance between the conductors
 (d) inversely proportional to I²

109. Fleming's left hand rule is used to find (C)
 (a) direction of magnetic field due to current carrying conductor
 (b) direction of flux in a solenoid
(c) direction of force on a current carrying conductor in a magnetic field
 (d) polarity of a magnetic pole
110. The force between two long parallel conductors is inversely proportional to (D)
 (a) Radius of conductors (b) current in one conductor
 (c) product of current in two conductors **(d)** distance between the conductors
111. Which of the following is the unit of magnetic flux density? (C)
 (a) weber (b) lumens
(c) tesla (d) none of the above
112. The magnetism left in the iron after exciting field has been removed is known as (B)
 (a) permeance **(b)** residual magnetism
 (c) susceptance (d) reluctance
113. Which of the following is not a unit of flux? (B)
 (a) Maxwell **(b)** Telsa
 (c) Weber (d) All of the above
114. One telsa is equal to (C)
 (a) 1 Wb/mm^2 (b) 1 Wb/m
(c) 1 Wb/m^2 (d) 1 mWb/m^2
115. The electromagnet has 50 turns and a current of 1 A flows through the coil. If the length of the magnet circuit is 200 mm, what is the magnetic field strength? (B)
 (a) 2500 AT/m **(b)** 250 AT/m
 (c) 25 AT/m (d) 2.5 AT/m
116. The change of cross sectional area of conductor in magnetic field will affect (C)
 (a) Reluctance of conductor (b) resistance of conductor
(c) (a) and (b) both in the same way (d) none of the above
117. What will be the magnetic potential difference across the air gap of 2 cm length in magnetic field of 200 AT/m ? (B)
 (a) 2 AT **(b)** 4 AT
 (c) 6 AT (d) 10 AT
118. Which part of the magnetic path requires largest m.m.f.? (A)
(a) Air gap (b) coil
 (c) inductance (d) core
119. Temporary magnets are used in (D)
 (a) Loud-speakers (b) generators
 (c) motors **(d)** all of the above
120. Strength of an electromagnet can be increased by (D)
 (a) increasing the cross-sectional area (b) increasing the number of turns
 (c) increasing current supply **(d)** all above methods

121. Core of an electromagnet should have (C)
 (a) Low coercivity (b) high susceptibility
(c) both of the above (d) none of the above
122. Magnetism of a magnet can be destroyed by (D)
 (a) Heating (b) hammering
 (c) by inductive action of another magnet **(d)** by all above methods
123. An air gap is usually inserted in magnetic circuits to (C)
 (a) Increase m.m.f. (b) increase the flux
(c) prevent saturation (d) none of the above
124. Permanent magnets are normally made by (A)
(a) Alnico alloys (b) aluminium
 (c) cast iron (d) wrought iron
125. A material for good magnetic memory should have (D)
 (a) low hysteresis loss (b) high permeability
 (c) low retentivity **(d)** high retentivity
126. Conductivity is analogous to (C)
 (a) retentivity (b) resistivity
(c) permeability (d) inductance
127. In a magnetic material hysteresis loss takes place primarily due to (D)
 (a) Rapid reversals of its magnetisation
 (b) flux density lagging behind magnetizing force
 (c) molecular friction **(d)** its high retentivity
128. If the area of hysteresis loop of a material is large, the hysteresis loss in this material will be (C)
 (a) zero (b) small
(c) large (d) none of the above
129. Reciprocal of reluctance is (B)
 (a) reluctivity **(b)** permeance
 (c) permeability (d) susceptibility
130. According to Steinmetz hysteresis law, hysteresis loss in a material is proportional to (B)
 (a) $B^{3.6}$ **(b)** $B^{1.6}$
 (c) $B^{1.2}$ (d) $B^{2.6}$
131. As per Faraday's laws of electromagnetic induction, an e.m.f. is induced in a conductor whenever it (C)
 (a) lies perpendicular to the magnetic flux (b) lies in a magnetic field
(c) cuts magnetic flux
 (d) moves parallel to the direction of the magnetic field
132. Which of the following circuit element stores energy in the electromagnetic field?
(a) Inductance (b) condenser (A)
 (c) variable resistor (d) resistance

133. The inductance of a coil will increase under all the following conditions except(A)
☒ (a) When more length for the same number of turns is provided
 (b) When the number of turns of the coil increase
 (c) When more area for each turn is provided
 (d) When permeability of the core increases
134. The direction of induced e.m.f. can be found by (B)
 (a) Laplace's law ☒ (b) Lenz's law
 (c) Fleming's right hand rule (d) Kirchhoff's voltage law
135. Air core coils are practically free from (C)
 (a) hysteresis losses (b) eddy current losses
☒ (c) both (a) and (b) (d) none of the above
136. A laminated iron core has reduced eddy-current losses because (B)
 (a) more wire can be used with less D.C. resistance in coil
☒ (b) the laminations are insulated from each other
 (c) the magnetic flux is concentrated in the air gap of the above
 (d) the laminations are stacked vertically
137. The co-efficient of self-inductance for a coil is given as (B)
 (a) $\frac{NI}{\phi}$ ☒ (b) $\frac{N\phi}{I}$
 (c) $\frac{NI^2}{\phi}$ (d) $\frac{N\phi}{I^2}$
138. The law that the induced e.m.f. and current always oppose the cause producing them is due to (B)
 (a) Faraday ☒ (b) Lenz
 (c) Newton (d) Coulomb
139. Which of the following circuit elements will oppose the change in circuit current (B)
 (a) Capacitance ☒ (b) inductance
 (c) Resistance (d) all of the above
140. For a purely inductive circuit which of the following is true? (C)
 (a) Apparent power is zero (b) Relative power is zero
☒ (c) Actual power of the circuit is zero
 (d) Any capacitance even if present in the circuit will not be charged
141. Which of the following is unit of inductance? (B)
 (a) Ohm ☒ (b) Henry
 (c) Ampere turns (d) Webers/metre
142. The core of a coil has a length of 200 mm. The inductance of coil is 6 mH. If the core length is doubled, all other quantities, remaining the same, the inductance will be(A)
☒ (a) 3 mH (b) 12 mH
 (c) 24 mH (d) 48 mH

143. The self inductances of two coils are 8 mH and 18 mH. If the co-efficients of coupling is 0.5, the mutual inductance of the coils is (C)
 (a) 4 mH (b) 5 mH
(c) 6 mH (d) 12 mH
144. In case all the flux from the current in coil 1 links with coil 2, the co-efficient of coupling will be (B)
 (a) 2.0 **(b) 1.0**
 (c) 0.5 (d) zero
145. A coil with negligible resistance has 50 V across it with 10 mA. The inductive reactance is (D)
 (a) 50 ohms (b) 500 ohms
 (c) 1000 ohms **(d) 5000 ohms**
146. A conductor 2 metres long moves at right angles to a magnetic field of flux density 1 tesla with a velocity of 12.5 m/s. The induced e.m.f. in the conductor will be (C)
 (a) 10 V (b) 15 V
(c) 25 V (d) 50 V
147. Which of the following inductor will have the least eddy current losses? (A)
(a) Air core (b) Laminated iron ore
 (c) Iron core (d) Powdered iron core
148. "The mass of an ion liberated at an electrode is directly proportional to the quantity of electricity". The above statement is associated with (C)
 (a) Newton's law
 (b) Faraday's law of electromagnetic induction
(c) Faraday's law of electrolysis (d) Gauss's law
149. The capacity of a cell is measured in (B)
 (a) amperes **(b) ampere-hours**
 (c) watts (d) watt-hours
150. Active materials of a lead acid cell are (D)
 (a) Spongy lead (b) lead peroxide
 (c) dilute H_2SO_4 **(d) all of the above**
151. Sulphation in a lead-acid battery occurs due to (D)
 (a) Heavy charging (b) fast charging
 (c) trickle charging **(d) incomplete charging**
152. During charging the specific gravity of the electrolyte of a lead-acid battery (A)
(a) Increases (b) decreases
 (c) remains the same (d) becomes zero
153. When a lead-acid battery is in fully charged condition, the colour of its positive plate is (C)
 (a) Dark grey (b) brown
(c) dark brown (d) none of the above

154. The active materials of a nickel-iron battery are (A)
 (a) Nickel hydroxide (b) powdered iron and its oxide
 (c) 21% solution of KOH (d) all of the above
155. The best indication about the state of charge on a lead-acid battery is given by (C)
 (a) output voltage (b) temperature of electrolyte
 (c) specific gravity of a electrolyte (d) none of the above
156. The output voltage of a charger is (D)
 (a) less than the battery voltage (b) higher than the battery voltage
 (c) the same as the battery voltage (d) none of the above
157. Trickle charging of a storage battery helps to (D)
 (a) maintain proper electrolyte level (b) increase its reserve capacity
 (c) prevent sulphation (d) keep it fresh and fully charged
158. Those substances of the cell which take active part in chemical combination and hence produce electricity during charging or discharging are known as materials. (D)
 (a) passive (b) active
 (c) redundant (d) inert
159. The ampere-hour efficiency of a lead-acid cell is normally between (D)
 (a) 20 to 30% (b) 40 to 50%
 (c) 60 to 70% (d) 90 to 95%
160. The capacity of a lead-acid cell depends on (E)
 (a) rate of discharge (b) temperature
 (c) density of electrolyte (d) quantity of active materials
 (e) all above
161. The specific gravity of electrolyte is measured by (C)
 (a) manometer (b) a mechanical gauge
 (c) hydrometer (d) psychrometer
162. When the specific gravity of the electrolyte of a lead-acid cell is reduced to 1.1 to 1.15 the cell is in (B)
 (a) charged state (b) discharged state
 (c) both (a) and (b) (d) active state
163. Over charging (D)
 (a) Produces excessive gassing (b) loosens the active material
 (c) increases the temperature resulting in buckling of plates
 (d) all above
164. Internal short circuits are caused by (C)
 (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

165. Local action in a battery is indicated by (D)
 (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
166. Internal resistance of a cell is due to (D)
 (a) Resistance of electrolyte (b) electrode resistance
 (c) surface contact resistance between electrode and electrolyte
(d) all above
167. The following indicate that battery on charge has attained full charge (D)
 (a) colour of electrode (b) gassing
 (c) specific gravity **(d)** all above
168. if the e.m.f. of a cell is 2 V, internal resistance $0.2\ \Omega$ and the external resistance $0.8\ \Omega$ then the current delivered will be (D)
 (a) 0.5 A (b) 1 A
 (c) 1.5 A **(d)** 2 A
169. Ampere hour capacity of an industrial battery is based on hours discharge rate. (A)
(a) 8 (b) 12
 (c) 16 (d) 24
170. Short circuiting of a cell may be caused by (E)
 (a) bucking of plates (b) faulty separators
 (c) lead particles forming circuit between positive and negative plates
 (d) excessive accumulation of sediment
(e) any one of above
171. While preparing electrolyte for a lead-acid battery (B)
 (a) water is poured into acid **(b)** acid is poured into water
 (c) anyone of the two can be added to other chemical
172. Cells are connected in parallel to (B)
 (a) Increase the efficiency **(b)** increase the current capacity
 (c) increase the voltage output (d) increase the internal resistance
173. Which secondary cell has the highest voltage output? (B)
 (a) Nickel-cadmium **(b)** lead acid
 (c) silver-cadmium (d) silver zinc
174. A floating battery is one (B)
 (a) Which gets charged and discharged simultaneously
(b) Which supplies current intermittently and also during off cycle gets charged
 (c) In which battery voltage is equal to charger voltage
 (d) In which the current in the circuit is fully supplied by the battery

175. Three cells are connected in series to form a battery. The internal resistance is $0.1\ \Omega$ each. The internal resistance of the battery is (C)
 (a) $0.1\ \Omega$ (b) $0.2\ \Omega$
(c) $0.3\ \Omega$ (d) $0.6\ \Omega$
176. Tickle charge is required for (D)
 (a) primary cells (b) lead-acid batteries
 (c) nickel-iron cells **(d)** all the above
177. Which of the following is a dry storage cell? (D)
 (a) Carbon-zinc cell (b) mercury cell
 (c) nickel-iron **(d)** nickel-cadmium cell
178. The efficiency of a solar cell may be in the range (B)
 (a) 2 to 5% **(b)** 10 to 15%
 (c) 30 to 40% (d) 70 to 80%
179. A bank of 12 cells is connected into 3 parallel branches containing 4 cells in series. What is the equivalent open circuit e.m.f. of bank? (C)
 (a) 2 V (b) 4 V
(c) 6 V (d) 12 V
180. Which law(s) find application in electrolysis ? (B)
 (a) Ohm's law **(b)** Faraday's laws
 (c) Coulomb's laws (d) Gauss's law
181. The electrode for a battery must be (C)
 (a) a semi-conductor (b) an insulator
(c) a good conductor of electricity (d) a bad conductor of electricity
182. if μ and μ_r are the absolute and relative magnetic permeabilities of a medium and μ_0 is the absolute permeability of free space, then (A)
(a) $\mu = \mu_0 \mu_r$ (b) $\mu = \frac{\mu_0}{\mu_r}$
 (c) $\mu = \frac{\mu_r}{\mu_0}$ (d) $\mu = \frac{1}{\mu_0 \mu_r}$
183. Electric displacement density D for a spherical surface is given by (C)
 (a) $D = \frac{q}{4\pi\epsilon r^2}$ (b) $D = \frac{q}{4\pi\epsilon}$
(c) $D = \frac{q}{4\pi r^2}$ (d) $D = \frac{q}{4r^2}$
184. The following law relates the forces experienced by two loops of wires carrying current (B)
 (a) Coulomb's law **(b)** Ampere's law
 (c) Newton's law (d) Laplace Equation
185. Hysteresis losses (B)
 (a) Generally increase with direct current in a coil
(b) Are caused by high frequency currents
 (c) Cannot be produced in an iron core because it is a conductor
 (d) Not of these

186. AC current can induce voltage because it has (B)
 (a) Constant magnetic field (b) varying magnetic field
 (c) stronger magnetic field (d) high peak value
187. According to Lenz's law, the direction of induced emf and hence current (C)
 (a) May be found by the right-hand rule
 (b) is always determined by the rate of cutting flux
 (c) always opposes the cause producing it
 (d) depends on whether the coil is wound with a right or left-hand spiral
188. The characteristic impedance of a lossless transmission line is given by (B)
 (a) $\sqrt{LC}$ (b) $\sqrt{\frac{L}{C}}$
 (c) $1/\sqrt{LC}$ (d) $\sqrt{\frac{C}{L}}$
189. The Fleming's left hand rule correlates to (D)
 (a) current, induced e.m.f. and direction of force on a conductor
 (b) magnetic field, electric field and direction of force on a conductor
 (c) self induction, mutual induction and direction of force on a conductor
 (d) current, magnetic field and direction of force on a conductor
190. The unit of relative permeability is (D)
 (a) Henry/metre (b) henry
 (c) henry/sq.m (d) it is dimensionless
191. The force between two long parallel conductors is inversely proportional to (D)
 (a) Radius of conductors (b) current in one conductor
 (c) product of current in two conductors (d) distance between the conductors
192. Materials subjected to rapid reversal of magnetism should have (B)
 (a) Large area of B-H loop (b) high permeability and low hysteresis loss
 (c) high co-ercivity and high retentivity (d) high co-ercivity and low density
193. Indicate which of the following material does not retain magnetism permanently (A)
 (a) Soft iron (b) stainless steel
 (c) hardened steel (d) none of the above
194. Gilbert is a unit of (B)
 (a) electromotive force (b) magnetomotive force
 (c) conductance (d) permittivity
195. Reciprocal of permeability is (A)
 (a) Reluctivity (b) susceptibility
 (c) permittivity (d) conductance
196. Which of the following is the unit of magnetic flux density? (C)
 (a) weber (b) lumens
 (c) tesla (d) none of the above

197. How much will be flux density in tesla units for flux of $45 \mu\text{Wb}$ through $6 \times 10^{-4} \text{m}^2$?
 (a) 0.075 T (b) 0.75 T (A)
 (c) 0.65 T (d) 1.5 T
198. One Maxwell is equal to (D)
 (a) 10^{-8} webers (b) 10^4 webers
 (c) 10^{-4} webers (d) 10^8 webers
199. Two long parallel conductors carry 100 A. if the conductors are separated by 20 mm, the force per metre of length of each conductor will be (D)
 (a) 100 N (b) 10 N
 (c) 1 N (d) 0.1 N
200. The electromagnet has 50 turns and a current of 1 A flows through the coil. If the length of the magnet circuit is 200 mm, what is the magnetic field strength ? (B)
 (a) 2500 AT/m (b) 250 AT/m
 (c) 25 AT/m (d) 2.5 AT/m
201. Field strength at the centre of a circular coil of radius r is (B)
 (a) $\frac{NI}{6r} \text{ A/m}$ (b) $\frac{NI}{2r} \text{ A/m}$
 (c) $\frac{N^2 I}{4r} \text{ A/m}$ (d) $\frac{N^2 I^2}{6r} \text{ A/m}$
202. The retentivity (a property) of material is useful for the construction of (A)
 (a) permanent magnets (b) transformers
 (c) non-magnetic substances (d) electromagnets
203. Which part of the magnetic path required largest m.m.f.? (A)
 (a) Air gap (b) coil
 (c) inductance (d) core
204. How does the magnetic compass needle behave in a magnetic field? (C)
 (a) It assures a position right angle to magnetic field
 (b) It starts rotating
 (c) It assures a position which follows a line of magnetic flux
 (d) None of the above
205. An air gap is usually inserted in magnetic circuits to (C)
 (a) Increase m.m.f. (b) increase the flux
 (c) prevent saturation (d) none of the above
206. Permeability in a magnetic circuit corresponds to in an electric circuit. (C)
 (a) Resistance (b) resistivity
 (c) conductivity (d) conductance
207. The magnetizing force (H) and magnetic flux density (B) are connected by the relation (B)
 (a) $B = \mu_r H / \mu_0$ (b) $B = \mu H$
 (c) $B = H / \mu_0 \mu_r$ (d) $B = \mu_0 H / \mu_r$

208. Permanent magnets are normally made of (A)
 (a) Alnico alloys (b) aluminium
 (c) cast iron (d) wrought iron
209. A material for good magnetic memory should have (D)
 (a) low hysteresis loss (b) high permeability
 (c) low retentivity (d) high retentivity
210. Conductivity is analogous to (C)
 (a) Retentivity (b) resistivity
 (c) permeability (d) inductance
211. In a magnetic material hysteresis loss takes place primarily due to (D)
 (a) Rapid reversals of its magnetization
 (b) flux density lagging behind magnetizing force
 (c) molecular friction
 (d) its high retentivity
212. If the area of hysteresis loop of a material is large, the hysteresis loss in this material will be (C)
 (a) Zero (b) small
 (c) large (d) none of the above
213. Silicon steel is used in electrical machines because it has (C)
 (a) Low co-ercivity (b) low retentivity
 (c) low hysteresis loss (d) high co-ercivity
214. The property of a material which opposes the creation of magnetic flux in it is known as (A)
 (a) Reluctivity (b) magneto motive force
 (c) permeance (d) resistance
215. The unit of reluctance is (D)
 (a) Metre/henry (b) henry/metre
 (c) henry (d) 1/henry
216. Laminated cores, in electrical machines, are used to reduce (B)
 (a) Copper loss (b) eddy current loss
 (c) hysteresis loss (d) all of the above
217. The area of hysteresis loop is a measure of (C)
 (a) Permittivity (b) permeance
 (c) energy loss per cycle (d) magnetic flux
218. Alternating voltages and currents are expressed in r.m.s. values because (C)
 (a) They can be easily determined (b) calculations become very simple
 (c) they give comparison with d.c. (d) none of the above
219. The form factor of a sinusoidal wave is (B)
 (a) 1.414 (b) 1.11
 (c) 2 (d) 1.5

220. In a pure resistive circuit, the instantaneous voltage and current are given by:
 $v = 250 \sin 314 \text{ volts}$ (C)
 $i = 10 \sin 314 t \text{ amperes}$
 The peak power in the circuit is
 (a) 1250 W (b) 25 W
(c) 2500 W (d) 250 W
221. An alternating voltage $v = V_m \sin \theta$ is applied to a pure capacitive circuit. The current equation will be (D)
 (a) $I_m \sin \theta$ (b) $I_m \sin (\theta - \pi/2)$
 (c) $I_m \sin (\theta + \pi/4)$ **(d)** $I_m \sin (\theta + \pi/2)$
222. The power factor of an a.c. circuit is given by (D)
 (a) X_L/R (b) Z/R
 (c) R/X_L **(d)** R/Z
223. The purpose of choke in a fluorescent tube is (D)
 (a) to decrease the current (b) to increase the current
 (c) to decrease the voltage momentarily **(d)** to increase the voltage momentarily
224. In an R-L series circuit, the two sides of the impedance triangle that form the phase angle are (B)
 (a) R and X_L **(b)** R and Z
 (c) Z and X_L (d) none of the above
225. An a.c. source is in series with R and L. If the respective potential drops are 200 V and 150 V, the applied voltage is (D)
 (a) 125 V (b) 350 V
 (c) 200 V **(d)** 250 V
226. In an R-L-C series circuit, $R=10 \Omega$; $L=1\text{H}$ and $C=1\mu\text{F}$. It is connected to 230 V a.c. source of variable frequency. When the frequency is set to zero, circuit current will be (D)
 (a) 23 A (b) 11.5 A
 (c) 46 A **(d)** zero
227. The Q-factor of a parallel resonant circuit is given by (A)
(a) $\frac{1}{R} \sqrt{\frac{L}{C}}$ (b) $\frac{1}{R} \sqrt{\frac{C}{L}}$
 (c) $\frac{1}{R} \sqrt{\frac{1}{LC}}$ (d) none of the above
228. Pure inductive circuit (C)
 (a) consumes some power on average (b) does not take power at all from a line
(c) takes power from the line during some part of the cycle and then returns back to it during other part of the cycle
 (d) none of the above
229. Inductance affects the direct current flow (C)
 (a) Only at the time of turning off (b) only at the time of turning on
(c) at the time of turning on and off (d) at all the time of operation

230. All the rules and laws of D.C. circuit also apply to A.C. circuit containing (C)
 (a) capacitance only (b) inductance only
(c) resistance only (d) all above
231. Power factor of the following circuit will be zero (D)
 (a) resistance (b) inductance
 (c) capacitance **(d)** both (b) and (c)
232. Power factor of the following circuit will be unity (C)
 (a) inductance (b) capacitance
(c) resistance (d) both (a) and (b)
233. The r.m.s. value of alternating current is given by steady (D.C.) current which when flowing through a given circuit for a given time produces (B)
 (a) The more heat than produced by A.C. when flowing through the same circuit
(b) The same heat as produced by A.C. when flowing through the same circuit
 (c) The less heat than produced by A.C. flowing through the same circuit
 (d) None of the above
234. In a pure resistive circuit (D)
 (a) Current lags behind the voltage by 90° (b) current leads the voltage by 90°
 (c) current can lead or lag the voltage by 90° **(d)** current is in phase with the voltage
235. In a pure inductive circuit (B)
 (a) The current is in phase with the voltage **(b)** current lags behind the voltage by 90°
 (c) the current leads the voltage by 90° (d) the current can lead or lag by 90°
236. Which of the following circuit component opposes the change in circuit voltage?
 (a) Inductance **(b)** capacitance (B)
 (c) conductance (d) resistance
237. Power factor of electric bulb is (D)
 (a) zero (b) lagging
 (c) leading **(d)** unity
238. If a sinusoidal wave has frequency of 50 Hz with 30 A r.m.s. current which of the following equation represents this wave ? (A)
(a) $42.42 \sin 314 t$ (b) $60 \sin 25 t$
 (c) $30 \sin 50 t$ (d) $84.84 \sin 25 t$
239. A pure inductance connected across 250 V, 50 Hz supply consumes 100 W. This consumption can be attributed to (D)
 (a) the big size of the inductor (b) the reactance of the inductor
 (c) the current flowing in the inductor **(d)** the statement given is false
240. The input of an A.C. circuit having power factor of 0.8 lagging is 40kVA. The power drawn by the circuit is (C)
 (a) 12 kW (b) 22 kW
(c) 32 kW (d) 64 kW

241. In an A.C. circuit, a low value of kVAR compared with kW indicates (B)
 (a) Low efficiency (b) high power factor
 (c) unity power factor (d) maximum load current
242. The apparent power drawn by an A.C. circuit is 10 kVA and active power is 8 kW. The reactive power in the circuit is (B)
 (a) 4 kVAR (b) 6 kVAR
 (c) 8 kVAR (d) 16 kVAR
243. The reactance offered by a capacitor to alternating current of frequency 50 Hz is 20 Ω . If the frequency is increased to 100 Hz, reactance becomes (B)
 (a) 5 Ω (b) 10 Ω
 (c) 15 Ω (d) 30 Ω
244. What will be the phase angle between two alternating waves of equal frequency, when one wave attains maximum value the other is at zero value ? (C)
 (a) 0° (b) 45°
 (c) 90° (d) 180°
245. In an A.C. circuit power is dissipated in (A)
 (a) resistance only (b) inductance only
 (c) capacitance only (d) none of the above
246. In a parallel R-C circuit, the current always the applied voltage (B)
 (a) lags (b) leads
 (c) remains in phase with (d) none of the above
247. Skin effect occurs when a conductor carries current at frequencies. (D)
 (a) very low (b) low
 (c) medium (d) high
248. In a sine wave the slope is constant (D)
 (a) between 0° and 90° (b) between 90° and 180°
 (c) between 180° and 270° (d) no where
249. Which of the following statements pertains to resistors only? (A)
 (a) can dissipate considerable amount of power
 (b) can act as energy storage devices
 (c) connecting them in parallel increases the total value
 (d) oppose sudden changes in voltage
250. Which of the following refers to a parallel circuit? (D)
 (a) The current through each element is same
 (b) The voltage across element is in proportion to its resistance value
 (c) The equivalent resistance is greater than any one of the resistors
 (d) The current through any one element is less than the source current
251. The frequency of domestic power supply in India is (D)
 (a) 200 Hz (b) 100 Hz
 (c) 60 Hz (d) 50 Hz

252. The voltage in a circuit follows the law $v = 100 \sin \omega t$
If the frequency is 25 Hz, how long will it take for the voltage to rise to 50 volts? (C)
- (a) $\frac{1}{50} s$ (b) $\frac{1}{100} s$
(c) $\frac{1}{300} s$ (d) $\frac{1}{600} s$
253. Ohm is unit of all of the following except (D)
- (a) Inductive reactance (b) capacitive reactance
(c) resistance (d) capacitance
254. If $A = 8 \angle 30^\circ$ and $B = 2 \angle 15^\circ$ the value of A/B will be (A)
- (a) $4 \angle 15^\circ$ (b) $6 \angle 30^\circ$
(c) $8 \angle 15^\circ$ (d) none of the above
255. Which of the following expression is true of apparent power in an A.C. circuit? (C)
- (a) $VI \cos \phi$ (b) $V_{av.} \times I_{av.}$
(c) $V_{r.m.s.} \times I_{r.m.s.}$ (d) $V_{peak} \times I_{peak}$
256. If impedance $Z_1 = 30 \angle 30^\circ$ and $Z_2 = 15 \angle 15^\circ$, what will be the value of $Z_1 \times Z_2$? (A)
- (a) $450 \angle 45^\circ$ (b) $300 \angle -15^\circ$
(c) $150 \angle 45^\circ$ (d) $50 \angle -15^\circ$
257. Which of the following values of an alternating current is indicated by a normal universal measuring instrument? (B)
- (a) $I_{av.}$ (b) $I_{r.m.s.}$
(c) $I_{av.}/2$ (d) $I_{max.}$
258. According to which of the alternating current values in the cross-sectional area of conductor with regard to the heating effect is selected? (D)
- (a) peak value (b) half peak value
(c) average value (d) r.m.s.value
259. A pure capacitor connected across an A.C. voltage consumed 50 W. this is due to (D)
- (a) this capacitive reactance in ohms (b) the current flowing in capacitor
(c) the size of the capacitor being quite big (d) the statement is incorrect
260. The power factor of a D.C. circuit is always (B)
- (a) Less than unity (b) unity
(c) greater than unity (d) zero
261. The equation of 50 Hz current sine wave having r.m.s. value of 60 A is (C)
- (a) $60 \sin 25 t$ (b) $60 \sin 50 t$
(c) $84.84 \sin 314 t$ (d) $42.42 \sin 314 t$
262. Which of the following values of alternating voltage should an insulation absolutely withstand? (C)
- (a) The average value (b) The r.m.s. value
(c) The peak value (d) Half the effective value

263. An A.C. voltage is impressed across a pure resistance of 3.5 ohms in parallel with a pure inductance of impedance of 3.5 ohms, (C)
 (a) The current through the resistance is more
 (b) The current through the resistance is less
(c) Both resistance and inductance carry equal currents
 (d) None of the above
264. In a pure inductive circuit if the supply frequency is reduced to $\frac{1}{2}$, the current will (B)
 (a) be reduced by half **(b)** be doubled
 (c) be four times as high (d) be reduced to one fourth
265. In a pure capacitive circuit if the supply frequency is reduced to $\frac{1}{2}$, the current will (A)
(a) be reduced by half (b) be doubled
 (c) be four times at high (d) be reduced to one fourth
266. The relation between the apparent power, actual power and reactive power is given by (D)
 (a) Apparent power = actual power + reactive power
 (b) Apparent power = actual power – reactive power
 (c) Apparent power = $\sqrt{(actual\ power)^2 - (reactive\ power)^2}$
(d) Apparent power = $\sqrt{(actual\ power)^2 + (reactive\ power)^2}$
267. When an alternating current passes through an ohmic resistance the electrical power converted into heat is (B)
 (a) apparent power **(b)** true power
 (c) reactive power (d) none of the above
268. In each of the three coils of a three phase generator, an alternating voltage having an r.m.s. value of 220 V is induced. Which of the following values is indicated by the voltmeters ? (A)
(a) 220 V (b) $220\sqrt{3}$ V
 (c) $220/\sqrt{3}$ V (d) none of the above
269. Which of the following equations is valid for a balanced load on a star circuit with a neutral conductor in a four wire star circuit? (A)
(a) $I_N = I_R + I_Y + I_B = 0$ (b) $I_N = I_R - I_Y + I_B$
 (c) $I_N = I_R + I_Y - I_B$ (d) $I_N = (V_R + V_Y + V_B)/R$
270. The true power drawn by a balanced three-phase consumer for line voltage V and line current I is given by (B)
 (a) $V I \cos \phi$ **(b)** $\sqrt{3} V I \cos \phi$
 (c) $3 V I \cos \phi$ (d) $\sqrt{3} V I$
271. An electric iron designed for 110 V A.C. supply was rated at 500 W. It was put across a 220 V supply. Assuming that at 110 V it supplied 500 W output, (i.e., no losses) at the new voltage it will supply (B)
 (a) 2500 W **(b)** 2000 W
 (c) 500 W (d) 250 W

272. A coil is connected across a 200 V, 50 Hz supply and takes a current of 10 A. The loss in the coil is 1000 W. The impedance and resistance of the coil are (C)
 (a) 10 Ω , 8 Ω (b) 15 Ω , 8 Ω
(c) 20 Ω , 10 Ω (d) 30 Ω , 15 Ω
273. While drawing vector diagram for a series circuit, the reference vector is (B)
 (a) Voltage **(b)** current
 (c) power (d) phase angle
274. What inductance will give the same reactance as a capacitor of 2 μ F when both are at 50 Hz? (A)
(a) 5 H (b) 10 H
 (c) 15 H (d) 20 H
275. In an A.C. circuit $I \sin \phi$ is called (B)
 (a) active component **(b)** wattles component
 (c) any of the above (d) none of the above
276. A 100 kW three phase delta connected motor works on a supply of three phase 3.3 kV. The motor efficiency is 92% and the power factor is 90%. The line current drawn by the motor will be (D)
 (a) 10 A (b) 15 A
 (c) 18 A **(d)** 21 A
277. The resonant frequency for a parallel circuit is given by (A)
(a) $\sqrt{\frac{1}{LC}}$ (b) $\frac{1}{4\pi} \sqrt{\frac{1}{L^2C}}$
 (c) $\frac{1}{8\pi} \sqrt{\frac{1}{LC^2}}$ (d) $\frac{1}{2\pi} \sqrt{\frac{L}{2C}}$
278. In a series resonant circuit the voltage across the circuit is the same as the voltage across (C)
 (a) inductance (b) capacitance
(c) resistance (d) none of the above
279. The value of operator j^2 is equal to (C)
 (a) Zero (b) +1
(c) -1 (d) $\sqrt{-1}$
280. An 8 Ω resistance, 16 Ω inductive reactance and an unknown capacitor are connected in series across a 100 V, 50 Hz supply. The current drawn by the circuit is 12.5 A. The value of capacitance of the capacitor will be (D)
 (a) 50 μ F (b) 100 μ F
 (c) 150 μ F **(d)** 200 μ F
281. The advantage of star connected supply system is that (B)
 (a) Line current is equal to phase current **(b)** two voltages can be used
 (c) phase sequence can be easily changed (d) it is a simple arrangement

282. In a star connected system, the relation between the line voltage V_L and phase voltage V_{ph} is (C)
 (a) $V_L = V_{ph}$ (b) $V_L = V_{ph}/\sqrt{3}$
(c) $V_L = \sqrt{3} V_{ph}$ (d) none of the above
283. If one line conductor of a 3-phase line is cut, the load is then supplied by Voltage. (A)
(a) Single phase (b) two phase
 (c) three phase (d) none of the above
284. In two wattmeter method, the algebraic sum of the readings of two wattmeters will indicate true power only if (D)
 (a) The load is balanced (b) phase sequence remains unchanged
 (c) there is no source unbalance
(d) neutral wire available does not carry any current
285. Transient disturbance is produced in a circuit whenever (D)
 (a) It is suddenly connected or disconnected from the supply
 (b) It is shorted
 (c) Its applied voltage is changed suddenly **(d)** All of the above
286. There are no transients in pure resistive circuits because they (C)
 (a) Offer high resistance (b) obey ohm's law
(c) have no stored energy (d) are linear circuits
287. Transient current in electrical circuits are associated with (D)
 (a) Inductors (b) capacitors
 (c) resistors **(d)** both (a) and (b)
288. The order of the lightning discharge current is (A)
(a) 10,000 amp (b) 100 amp
 (c) 1 amp (d) 1 microampere
289. The magnetizing-inrush-current in a transformer is rich in (D)
 (a) 3rd harmonics (b) 5th harmonics
 (c) 7th harmonics **(d)** 2nd harmonics
290. The main reason for generation of harmonics in a transformer could be (D)
 (a) Fluctuating load (b) poor insulation
 (c) mechanical vibrations **(d)** saturation of core
291. Harmonics in transformer result in (D)
 (a) Increased core losses (b) increased I^2R losses
 (c) magnetic interference communication circuits **(d)** all of the above
292. The efficiency of a d.c. shunt generator is maximum when the (D)
 (a) Magnetic losses are equal to the mechanical losses
 (b) Field copper losses are equal to the constant losses
 (c) Stray losses are equal to the copper losses
(d) Armature copper losses are equal to constant losses

293. In a dc generator, the brushes on the commutator are shifted from geometrical neutral positions to (B)
 (a) Obtain highest generator voltage (b) avoid sparking
 (c) obtain highest generator efficiency (d) all the above
294. A DC generator can be termed as a (A)
 (a) Rotating amplifier (b) prime mover
 (c) power pump (d) none of the above
295. If residual magnetism of a shunt generator is destroyed accidentally, it may be restored by connecting its shunt field (D)
 (a) To earth (b) to an alternator
 (c) in reverse (d) to a battery
296. The sole purpose of commutator in a dc generator is to (D)
 (a) Increase output voltage (b) reduce sparking at brushes
 (c) provide smoother output
 (d) convert the induced alternating voltage into unidirectional pulses
297. All rotating electric machines are basically (C)
 (a) d.c machines (b) a.c. machines
 (c) electro-mechanical convertors
 (d) machines using electromagnetic induction
298. The function of commutator in a dc machine is (C)
 (a) to improve commutation (b) to change dc voltage into dc voltage
 (c) to change ac voltage into dc voltage (d) to provide easy speed control
299. A conductor is rotating within a magnetic field. At which of the following positions do the zero voltages occur? (A)
 (a) along the axis of the magnetic field
 (b) at right angles to the axis of the magnetic field
 (c) at 45° with the axis of the magnetic field
 (d) none of these
300. which of the following parts helps the commutation process? (A)
 (a) Interpoles (b) compensating winding
 (c) pole shoes (d) all of these
301. Commutation in a dc machine may be improved by (D)
 (a) reducing to number of turns in the armature and segments of commutator
 (b) increasing the resistances of brushes
 (c) neutralizing the reactance voltage by producing a reverse emf in the coil undergoing commutation
 (d) all of these
302. Brushes are commutators for 220 V dc generator are generally made of (C)
 (a) Copper (b) carbon copper
 (c) electrographite (d) graphited copper
303. Commutator of a dc machine acts as a (A)
 (a) Fullwave rectifier (b) halfwave rectifier
 (c) Inverter (d) controlled rectifier

304. The rotating part of a dc generator is known as (C)
 (a) Pole (b) stator
(c) armature (d) commutator
305. The emf induced in the armature of a dc machine is proportional to (B)
 (a) Φ/N **(b) ΦN**
 (c) $0/(\Phi N)$ (d) N/Φ
306. In a dc machine if P is the number of poles, N is the armature speed in rpm, then the frequency of magnetic reversal will be (C)
 (a) $\frac{PN}{60}$ (b) $\frac{PN}{30}$
(c) $\frac{PN}{120}$ (d) $\frac{PN}{180}$
307. Hysteresis losses in a dc generator are basically due to (B)
 (a) Current flowing in the armature core
(b) reversal of magnetism of the armature core
 (c) initial energy to magnetise the core (d) none of these
308. Eddy current losses in a dc machine vary as (D)
 (a) $1/t$ (b) $1/t^2$
 (c) t **(d) t^2**
309. Core losses in a dc machine occur in (C)
 (a) Armature alone (b) pole faces along
(c) both armature and pole faces (d) yoke alone
310. The open circuit voltage of a dc compound generator is 200 V. At full load, the terminal voltage (B)
 (a) Will always be 200 V **(b) will always be less than 200 V**
 (c) will always be greater than 200 V (d) may be greater than or less than 200 V
311. A dc shunt motor is rotating in clockwise direction as viewed from one end. The polarity of connection of the armature and field winding are reversed simultaneously. The motor will (C)
 (a) Not rotate at all (b) rotate in anti-clockwise direction
(c) rotate in clockwise direction (d) none of above
312. Which of the following motor has high starting torque? (B)
 (a) ac series motor **(b) dc series motor**
 (c) induction motor (d) synchronous motor
313. By applying Fleming's right hand rule to an electric generator, you can find the (B)
 (a) direction of magnetic field **(b) direction of induced emf**
 (c) direction of rotor motion (d) law of induction
314. Interpoles in dc motors are used for (B)
 (a) Increasing the speed of motor **(b) reducing sparking at the commutator**
 (c) decreasing the counter emf (d) converting armature current to dc
315. The back emf of a dc motor (C)
 (a) Adds to the supply voltage (b) regulates its armature voltage
(c) helps in energy conversion (d) usually exceeds the supply voltage

316. The voltage equation of a dc motor is (A)
 (a) $V = V_b + I_a R_a$ (b) $V = V_b - I_a R_a$
 (c) $V = V_b - \frac{1}{2} I_a R_a$ (d) $V = V_b + \frac{1}{2} I_a R_a$
317. A 150 V dc motor of armature resistance 0.4Ω has back emf of 142V. The armature current is (B)
 (a) 10 A (b) 20 A
 (c) 150 A (d) 100 A
318. A dc motor develops of torque of 100 Nm at 1000 rpm. If the motor now runs at 1200 rpm, the torque will be (C)
 (a) 120 Nm (b) 144 Nm
 (c) 100 Nm (d) 83.3 Nm
319. Which of the following do motor has approximately constant speed? (B)
 (a) Series motor (b) shunt motor
 (c) cumulatively compound motor (d) differentially compound motor
320. The brush voltage drops in dc motors in the of the order of (A)
 (a) 2 V (b) 10 V
 (c) 20 V (d) 40 V
321. A dc motor draws high current at the time of starting because (C)
 (a) $V_b > V$ (b) $V_b < V$
 (c) $V_b = 0$ (d) $V_b = V$
 Where V_b is the back emf
322. The most economical method of electrical braking of a dc motor is (A)
 (a) regenerative braking (b) dynamic braking with self excitation
 (c) dynamic braking with separate excitation (d) plugging
323. DC series motor are best suited for traction because (B)
 (a) Torque is proportional to the square of the armature current and speed is proportional to the torque
 (b) Torque is proportional to square of the armature current and speed is inversely proportional to the torque
 (c) Torque and speed both are proportional to the square of the armature current
 (d) None of these
324. The nominal power printed on the name plate of any motor signifies the (B)
 (a) power drawn in kVA (b) output power at the shaft
 (c) power drawn in kW (d) the gross power
325. During the normal operation of a series motor, if the field circuit suddenly opens, the motor (A)
 (a) Speed will increase (b) speed will drop
 (c) will stop (d) speed will remain unchanged
326. The generated emf and the current are in the opposite direction in case of (A)
 (a) dc motors (b) dc generators
 (c) both dc motors as well as dc generators (d) neither dc motors nor dc generators

327. A 4 pole d.c. generator is running at 1500 r.p.m. The frequency of current in the armature winding is (B)
 (a) 25 Hz (b) 50 Hz
 (c) zero Hz (d) 100 Hz
328. The laws of electromagnetic induction (Faraday's and Lenz's law) are summarized in the following equation (C)
 (a) $e = iR$ (b) $e = L \frac{di}{dt}$
 (c) $e = \frac{d\psi}{dt}$ (d) none of the above
329. D.C. series motors are used (D)
 (a) Where load is constant (b) where load changes frequently
 (c) where constant operating speed is needed (d) in none of the above situations
330. Sparking at the commutator of a D.C. motor may result in (D)
 (a) Damage to commutator segments (b) damage to commutator insulation
 (c) increased power consumption (d) all of the above
331. The condition for maximum power in case of D.C. motor is (B)
 (a) back e.m.f. = 2 X supply voltage (b) back e.m.f. = $\frac{1}{2}$ X supply voltage
 (c) supply voltage = $\frac{1}{2}$ x back e.m.f. (d) supply voltage = back e.m.f.
332. Buses, trains, trolleys, hoists, cranes require high starting torque and therefore make use of (A)
 (a) D.C. series motor (b) D.C. shunt motor
 (c) induction motor (d) all of above motors
333. Which of the following loss in a D.C. generator varies significantly with the load current ? (C)
 (a) Field copper loss (b) windage loss
 (c) armature copper loss (d) none of the above
334. If B_{max} is the maximum flux density, then eddy current loss will vary as (B)
 (a) B_{max} (b) $(B_{max})^2$
 (c) $(B_{max})^{1.2}$ (d) $(B_{max})^{2.4}$
335. The hysteresis loss in a D.C. generator varies with the frequency of magnetic reversals is (B)
 (a) $\frac{1}{f}$ (b) f
 (c) $f^{1.6}$ (d) f^2
336. Which loss in a D.C generator varies with load? (A)
 (a) Copper loss (b) eddy current loss
 (c) hysteresis loss (d) windage loss
337. Which loss in a D.C. generator does not vary with load as well as flux density? (D)
 (a) Copper loss (b) eddy current loss
 (c) hysteresis loss (d) windage loss

338. Which of the following loss in a D.C generator is dissipated in the form of heat? (D)
 (a) Mechanical loss (b) core loss
 (c) copper loss **(d)** all of the above
339. Which of the following losses are significantly reduced by laminating the core of a D.C.generator? (B)
 (a) Hysteresis losses **(b)** eddy current losses
 (c) copper losses (d) windage losses
340. The condition for maximum efficiency for D.C.generator is (D)
 (a) eddy current losses = stray losses (b) hysteresis losses = eddy current losses
 (c) copper losses = 0 **(d)** variable losses = constant losses
341. During Rheostat braking of D.C.series motors (A)
(a) motor is run as a generator (b) motor is reversed in direction
 (c) motor is run at reduced speed (d) motor runs in toggle mode
342. For which types of D.C.motor, dynamic braking is generally used? (D)
 (a) shunt motors (b) series motors
 (c) compound motors **(d)** all of the above
343. A 230 V D.C. shunt motor takes 32 A at full load. The back e.m.f. on full load, if the resistance of motor armature and shunt field winding are 0.2Ω and 115Ω respectively, will be (D)
 (a) 210 V (b) 215 V
 (c) 220 V **(d)** 224 V
344. The mechanical power developed by a D.C motor is equal to (B)
 (a) power input + losses **(b)** back e.m.f. x armature current
 (c) power output x losses (d) power output x efficiency
345. The variable resistor shunting the field of a D.C series motor is called a (C)
 (a) Armature divertor (b)voltage regulator
(c) field divertor (d) potential divider
346. Which of the following methods gives the greatest braking torque ? (B)
 (a) Regenerative braking **(b)** plugging
 (c) Rheostatic braking (d) none of the above
347. In case of D.C.machines, mechanical losses are primary function of (B)
 (a) Current (b) voltage
(c) Speed (d) none of above
348. Iron losses in a D.C. machine are independent of variations in (B)
 (a) Speed **(b)** load
 (c) voltage (d) speed and voltage
349. If B is the flux density,/the length of conductor and v the velocity of conductor, then induced e.m.f. is given by (A)
(a) Blv (b) Blv^2
 (c) Bl^2v (d) Bl^2v^2

350. The polarity of a D.C.generator can be reversed by (A)
 (a) Reversing the field current (b) increasing field current
 (c) reversing field current as well as direction of rotation
 (d) any of the above
351. In D.C generators, the brushes on commutator remain in contact with conductors which (C)
 (a) Lie under south pole (b) lie under north pole
 (c) lie under interpolar region (d) are farthest from the poles
352. In a lap wound D.C. generator having p as number of poles and Z as number of conductors, the maximum number of equalizer rings will be (C)
 (a) Z (b) p
 (c) $\frac{2Z}{p}$ (d) $\frac{2p}{Z}$
353. Armature reaction of an unsaturated D.C. machine is (A)
 (a) crossmagnetising (b) demagnetizing
 (c) magnetizing (d) none of above
354. The function of pole shoes in the case of D.C machine is (D)
 (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) To discharge all the above functions
355. The demagnetizing component of armature reaction in a D.C. generator (A)
 (a) Reduces generator e.m.f. (b) increases armature speed
 (c) reduced interpoles flux density (d) results in sparking trouble
356. Magnetic field in a D.C generator is produced by (A)
 (a) Electromagnets (b) permanent magnets
 (c) both (a) and (b) (d) none of the above
357. The number of brushes in a commutator depends on (D)
 (a) Speed of armature (b) type of winding
 (c) voltage (d) amount of current to be collected
358. In a D.C generator the ripples in the direct e.m.f. generated are reduced by (B)
 (a) using conductor of annealed copper
 (b) using commutator with large number of segments
 (c) using carbon brushes of superior quality
 (d) using equilliser rings
359. The armature core of a D.C generator is usually made of (A)
 (a) silicon steel (b) copper
 (c) non-ferrous material (d) cast-iron
360. D.C.generator generates (A)
 (a) a.c. voltage in the armature (b) d.c. voltage in the armature
 (c) a.c. superimposed over d.c. (d) none of the above

361. Interpole flux should be sufficient to (C)
 (a) neutralize the commutating self-induced e.m.f
 (b) neutralize the armature reaction flux
(c) neutralize both the armature reaction flux as well as commutating e.m.f. induced in the coil
 (d) perform none of the above functions
362. In a D.C generator the number of mechanical degrees and electrical degrees will be the same when (D)
 (a) r.p.m. is more than 300 (b) r.p.m. is less than 300
 (c) number of poles is 4 **(d)** number of poles is 2
363. In a D.C. machine stray loss is the sum of (D)
 (a) Total copper loss and mechanical loss (b) armature copper loss and iron loss
 (c) shunt field copper loss and mechanical loss
(d) iron loss and mechanical loss
364. A 220 V D.C generator is run at full speed without any excitation. The open circuit voltage will be (B)
 (a) Zero **(b)** about 2 V
 (c) about 50 V (d) 220 V
365. If residual magnetism is present in a D.C. generator, the induced e.m.f. at zero speed will be (A)
(a) Zero (b) small
 (c) the same as rated voltage (d) high
366. The terminal voltage of a series generator is 150 V when the load current is 5 A. If the load current is increased to 10 A, the terminal voltage will be (C)
 (a) 150 V (b) less than 150 V
(c) greater than 150 V (d) none of the above
367. A transformer transforms (D)
 (a) Frequency (b) only voltage
 (c) only current **(d)** power
368. An ideal transformer is one which (B)
 (a) has a common core for its primary and secondary windings
(b) has no losses and magnetic leakage
 (c) has core of stainless steel and windings of pure copper metal
 (d) has interleaved primary and secondary windings
369. In an ideal transformer, the no-load primary current I_0 (A)
(a) lags behind V_1 by 90° (b) is in phase with V_1
 (c) leads V_1 by 90° (d) lags V_1 by an angle lying between 0° and 90°
370. The primary and secondary induced emfs E_1 and E_2 in a two winding transformer are always (C)
 (a) Equal in magnitude (b) antiphase with each other
(c) in-phase with each other (d) determined by load on transformer secondary

371. Regarding the working component I_w and magnetizing component I_μ of the no load primary current of a transformer which of the following statement is true? (A)
- (a) $I_w < I_\mu$ (b) $I_w > I_\mu$
 (c) $I_w = I_\mu$ (d) $I_\mu/I_w = \text{constant}$
372. Transformer cores are built up from laminations rather than from solid metal so that (B)
- (a) Oil penetrates the core more easily (b) eddy current loss is reduced
 (c) less insulation is required for the windings (d) turn ratio is higher than voltage ratio
373. Iron loss in an actual transformer remains practically constant from no load to full load because (A)
- (a) Core flux remains practically constant (b) primary voltage remains constant
 (c) value of transformation ratio remains constant
 (d) permeability of transformer core remains constant
374. The primary reason why open circuit test is performed on the lowest voltage winding of the transformer is that it (A)
- (a) draws sufficiently large no-load current for convenient reading
 (b) requires least voltage to perform the test
 (c) needs minimum power input
 (d) has become a universal custom
 (a) involves less core loss
375. The commercial efficiency of a transformer while on open circuit is (A)
- (a) Zero (b) maximum
 (c) indeterminate (d) incalculable
376. The ordinary efficiency of a given transformer is maximum when (C)
- (a) It runs at half full-load (b) it runs at full-load
 (c) its Cu loss equals iron loss (d) it runs over load
377. The saving in Cu achieved by converting 2-winding transformer into an autotransformer is determined by (A)
- (a) Voltage transformation ratio (b) load on the secondary
 (c) magnetic quality of core material (d) size of the transformer core
378. Transformer works on the principle of (D)
- (a) Mutual induction (b) self induction
 (c) faraday's law of electromagnetic induction (d) self and mutual induction both
379. Shell type transformer is popularly used because it has (D)
- (a) More magnetic leakage flux (b) less magnetic leakage flux
 (c) two magnetic paths (d) both (b) and (c) above
380. Transformer oil must be free from (D)
- (a) Odour (b) gases
 (c) sulphur (d) moisture
381. Which of the following parts of a transformer is likely to suffer maximum damage due to excessive temperature rise? (D)
- (a) Copper windings (b) core laminations
 (c) dielectric strength of oil (d) winding insulation

382. Transformer oil used in transformer provides (A)
(a) Insulation and cooling (b) cooling and lubrication
(c) lubrication and insulation (d) insulation, cooling and lubrication
383. The size of transformer core depends on (D)
(a) Frequency (b) area of the core
(c) flux density of core material (d) both (a) and (c) above
384. Air blast cooling is provided for transformers of capacity exceeding (D)
(a) 500 kVA (b) 1000 kVA
(c) 3000 kVA (d) 10000 kVA
385. The power factor in a transformer (D)
(a) is always unit (b) is always leading
(c) is always lagging (d) depends on the power factor of load
386. Which of the following transformers will be largest in size? (A)
(a) 1 kVA, 50 Hz (b) 1 kVA, 60 Hz
(c) 1 kVA, 100 Hz (d) 1 kVA, 500 Hz
387. In a three phase transformer, the phase difference between the primary voltage and the induced secondary winding voltage is (C)
(a) 90° (b) 120°
(c) 180° (d) 270°
388. When the secondary of a transformer is loaded, the current in the primary side will (D)
(a) Not be effected (b) increase
(c) decrease
(d) be the sum of no-load current and excess current drawn due to the secondary current
389. If a 1000 kVA, 200 Hz transformer is operated at 50 Hz its kVA rating is (B)
(a) 100 kVA (b) 250 kVA
(c) 4000 kVA (d) 500 kVA
390. A single phase transformer has turn ratio of 10. The primary winding has resistance of 2.2 ohms and the secondary winding has resistance of 0.03 Ω . The total resistance as referred to the primary is (B)
(a) 2.5 Ω (b) 5.2 Ω
(c) 2.23 Ω (d) 2.203 Ω
391. At full load, the copper loss in a transformer is 600 watts. At half load, the copper load will be (B)
(a) 300 watts (b) 150 watts
(c) 75 watts (d) 600 watts
392. The all-day efficiency of a transformer depends primarily on (D)
(a) Its copper loss (b) the amount of load
(c) the duration of load (d) both (b) and (c) above

393. Regulation of a good transformer should be near (A)
 (a) 1% (b) 10%
 (c) 20% (d) 30%
394. Buchholz relay is usually not provided on transformers of rating below (D)
 (a) 5 kVA (b) 50 kVA
 (c) 100 kVA (d) 500 kVA
395. Scott connections are used for (C)
 (a) Single-phase to three phase transformation
 (b) Three-phase to single phase transformation
 (c) Three-phase to three phase & two phase transformations
 (d) Any of the above
396. A transformer has N_1 and N_2 turns in primary and secondary windings respectively. Its secondary windings reactance of $x_2 \Omega$, when referred to primary is (C)
 (a) $x_2 \left(\frac{N_2}{N_1}\right)^2$ (b) $x_2 \frac{N_2}{N_1}$
 (c) $x_2 \left(\frac{N_1}{N_2}\right)^2$ (d) $x_2 \frac{N_1}{N_2}$
397. A good voltage regulation of a transformer means (D)
 (a) Difference between primary and secondary voltage is least
 (b) Difference between primary and secondary voltage is maximum
 (c) Output voltage fluctuation with power factor is the least
 (d) Output voltage fluctuation from no load to full load is least
398. A 220/115 V, 25 Hz, 1-phase transformer has eddy current loss of 100 watt which is half of the no-load at rated applied voltage. If this transformer is used with primary connected to a 440 V, 50 Hz mains, the total no-load loss would be (B)
 (a) 300 W (b) 600 W
 (c) 1000 W (d) 400 W
399. If Cu loss of a transformer at $7/8^{\text{th}}$ full load is 4900 W, then its full load Cu loss would be (B)
 (a) 5600 watts (b) 6400 watts
 (c) 375 watts (d) 429 watts
400. Can a 50 Hz transformer be used for 25 Hz, if the input voltage is maintained constant at the rated value corresponding to 50 Hz? (B)
 (a) Yes. Since the voltage is constant, current levels will not change
 (b) No. Flux will be doubled which will drive the core to excessive saturation
 (c) No. owing to decreased reactance of transformer, input current will be doubled at load
 (d) Yes. At constant voltage, insulation will not be overstressed.
401. A 40 kVA transformer has a core loss of 400 W and a full-load copper loss of 800 W. The proportion of full-load at maximum efficiency is (C)
 (a) 50% (b) 62.3%
 (c) 70.7% (d) 100%

402. The secondary of a current transformer is always short circuited under operating conditions because (C)
(a) It protects the primary circuits (b) it is safe to human beings
(c) it avoids core saturation and high voltage induction (d) none of the above
403. While conducting short circuit test on a transformer the following side is short circuited (B)
(a) H.V. side **(b)** L.V.side
(c) primary side (d) none of the above
404. What is a typical use of an auto transformer? (D)
(a) Isolating transformer (b) toy transformer
(c) control transformer **(d)** variable transformer
405. The insulating properties of transformer oil are adversely affected by the presence of (C)
(a) oxygen (b) copper
(c) moisture (d) ozone
406. Buchholz relay works on the principle of (D)
(a) Production of eddy currents whenever load changes are rapid
(b) Ionization of transformers oil
(c) Magnetic hum due to sudden variation in load
(d) Generation of gas due to breakdown of the insulation
407. In a transformer, the primary and the secondary voltage are (C)
(a) 60° out of phase (b) 90° out of phase
(c) 180° out of phase (d) always in phase
408. A transformer cannot raise or lower the voltage of a D.C. supply because (C)
(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
409. Efficiency of a power transformer is of the order of (B)
(a) 100 percent **(b)** 98 percent
(c) 50 percent (d) 25 percent
410. Natural oil cooling is used for transformers upto a rating of (A)
(a) 3000 kVA (b) 1000 kVA
(c) 500 kVA (d) 250 kVA
411. No-load current of a transformer has (D)
(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
412. The power transformer is a constant (D)
(a) Voltage device (b) current device
(c) power device **(d)** main flux device

413. In a transformer the tappings are generally provided on (C)
 (a) Primary side (b) secondary side
(c) low voltage side (d) high voltage side
414. The chemical used in breather for transformer should have the quality of (B)
 (a) Ionizing air **(b)** absorbing moisture
 (c) cleansing the transformer oil (d) cooling the transformer oil
415. The chemical used in breather is (D)
 (a) Asbestors fibre (b) silica sand
 (c) sodium chloride **(d)** silica gel
416. The transformer ratings are usually expressed in terms of (D)
 (a) Volts (b) ampers
 (c) kW **(d)** kVA
417. Hysteresis loss in a transformer varies as ($B_{\max}$ =maximum flux density) (B)
 (a) $B_{\max}$ **(b)** $B_{\max}^{1.6}$
 (c) $B_{\max}^{1.85}$ (d) $B_{\max}^{2.4}$
418. Material used for construction of transformer core is usually (D)
 (a) Wood (b) copper
 (c) aluminiumS **(d)** silicon steel
419. The function of conservator in a transformer is (D)
 (a) to project against internal fault (b) to reduce copper as well as core losses
 (c) to cool the transformer oil
(d) to take care of the expansion and contraction of transformer oil due to variation of temperature of surroundings
420. The magnetizing current of a transformer is usually small because it has (A)
(a) Small air gap (b) large leakage flux
 (c) laminated silicon steel core (d) fewer rotating parts
421. The full-load copper loss of a transformer is 1600 W. At half-load the copper loss will be (D)
 (a) 6400 W (b) 1600 W
 (c) 800 W **(d)** 400 W
422. The value of flux involved in the e.m.f. equation of a transformer is (C)
 (a) Average value (b) r.m.s. value
(c) maximum value (d) instantaneous value
423. Which winding of the transformer has less core-sectional area ? (D)
 (a) Primary winding (b) secondary winding
 (c) low voltage winding **(d)** high voltage winding
424. An ideal transformer is one which ha (A)
(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

425. When a given transformer is run at its rated voltage but reduced frequency, its
 (a) Flux density remains unaffected (b) iron losses are reduced (D)
 (c) core flux density is reduced (d) core flux density is increased
426. In an actual transformer the iron loss remains practically constant from no-load to full-load because (C)
 (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
427. Open circuit test on transformers is conducted to determine (C)
 (a) Hysteresis losses (b) copper losses
 (c) core losses (d) eddy current losses
428. Short circuit test on transformers is conducted to determine (B)
 (a) Hysteresis losses (b) copper losses
 (c) core losses (d) eddy current losses
429. A transformer transforms (D)
 (a) Voltage (b) current
 (c) current and voltage (d) power
430. Which of the following is not the standard voltage for power supply in India? (D)
 (a) 11 kV (b) 33 kV
 (c) 66 kV (d) 122 kV
431. 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? (D)
 (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
432. A good voltage regulation of a transformer means (A)
 (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
433. The efficiency of a transformer, under heavy load, is comparatively low because (A)
 (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
434. The voltage transformation ratio of a transformer is equal to the ratio of (C)
 (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

435. In a transformer frictional loss is (D)
(a) 5% of total loss (b) 10% of total loss
(c) 20% of total loss (d) zero
436. The place of transformer installation is selected such that (D)
(a) Location is not too warm
(b) Plentry of dry and clean air is available and wet conditions are not encountered
(c) Location is not subject to damage from men and material traffic
(d) All above requirements are met with
437. In core-type transformers, the concentric windings are used with (A)
(a) Low voltage winding placed next to core
(b) Low voltage winding on the outer side
(c) High voltage winding placed next to core
(d) High voltage winding on the outer side
438. Which of the following is not a fitting on a transformer? (A)
(a) Commutator (b) breather
(c) conservator (d) Buchholz's relay
439. The reactance of a transformer depends on (A)
(a) leakage flux (b) size of the core
(c) size of the tank (d) all of the above
440. Which of the following can be reduced when the flux density in the transformer core is increased ? (C)
(a) copper losses (b) output frequency
(c) size of the transformer (d) none of the above
441. Burden of a current transformer is usually expressed in (C)
(a) amperes (b) volts
(c) volt amperes (d) kilowatt
442. When 240 V D.C. supply is given to an unloaded 220 V, 50 Hz transformer (B)
(a) Secondary will carry heavy current
(b) Primary will carry heavy current and may possibly burn
(c) We will get A.C. voltage on secondary side according to turn ratio
(d) We will get high voltage on secondary side
443. When a transformer winding suffers a short-circuit, the adjoining turns of the same winding experience (A)
(a) An attractive force (b) a repulsive force
(c) No force (d) none of the above
444. A 10 kVA, 400 V/200 V single phase transformer with 10% impedance draws a steady short circuit line current of (C)
(a) 50 A (b) 150 A
(c) 250 A (d) 350 A

445. A 500 kVA, 3-phase transformer has iron losses of 300 W and full load copper losses of 600 W. The percentage load at which the transformer is expected to have maximum efficiency is (B)
 (a) 50.0 % (b) 70.7 %
 (c) 141.4 % (d) 200.0 %
446. The no-load speed of a 3-phase, 4-pole induction motor connected to a 3-phase, 50 Hz supply is expected to be –rpm. (B)
 (a) 1400 (b) 1480
 (c) 1450 (d) 1498
447. A 400-kW, 3-phase, 440-V, 50HZ induction motor has a speed of 950 r.p.m. on full-load. The machine has 6 poles. The slip of the machine will be (D)
 (a) 0.06 (b) 0.10
 (c) 0.04 (d) 0.05
448. In a 3- ϕ , 4-pole, 50-Hz induction motor running with 1455 rpm, the speed of rotor field with respect to the rotor structure is –rpm. (C)
 (a) Zero (b) 1455
 (c) 45 (d) 1500
449. The effect of increasing the length of air-gap in an induction motor will be to increase the (C)
 (a) Power factor (b) speed
 (c) magnetizing current (d) air-gap flux
450. In a 3- ϕ induction motor, reactance under running conditions is less than its standstill value because of decrease in (B)
 (a) Rotor inductance (b) frequency of rotor emf
 (c) stator magnetic flux
 (d) mutual flux linking the stator and rotor conductors
451. Which statement regarding double squirrel-cage induction motor (DSCIM) is false? (D)
 (a) It is particularly useful where frequent starting under heavy loads is required
 (b) It maintains high efficiency during normal operating conditions
 (c) It has better speed regulation than single squirrel-cage motor
 (d) Its upper cage is of low resistance and lower cage is high resistance
452. The fractional slip of an induction motor is the ratio (A)
 (a) rotor Cu loss/rotor input (b) stator Cu loss/stator input
 (c) rotor Cu loss/rotor output (d) rotor Cu loss/stator Cu loss
453. The principle of operation of a 3-phase induction motor is most similar to that of a (C)
 (a) Synchronous motor (b) repulsion start induction motor
 (c) transformer with a shorted secondary (d) capacitor-start, induction-run motor
454. Which method is the least used for 3-phase motor starting? (A)
 (a) Y- Δ (b) auto transformer
 (c) across the line (d) primary resistors

455. In case of the induction motors the torque is (D)
 (a) Inversely proportional to ($\sqrt{\text{slip}}$) (b) directly proportional to (slip)²
 (c) inversely proportional to slip (d) directly proportional to slip
456. For which motor the speed can be controlled from rotor side? (B)
 (a) Squirrel cage induction motor (b) slip ring induction motor
 (c) both (a) and (b) (d) none of the above
457. If any two phases for an induction motor are interchanged (A)
 (a) The motor will run in reverse direction (b) the motor will run at reduced speed
 (c) the motor will not run (d) the motor will burn
458. An induction motor is (C)
 (a) Self-starting with zero torque (b) self-starting with high torque
 (c) self starting with low torque (d) non-self starting
459. The maximum torque in an induction motor depends on (D)
 (a) Frequency (b) rotor inductive reactance
 (c) square of supply voltage (d) all of the above
460. In three-phase squirrel-cage induction motors (B)
 (a) Rotor conductor ends are short-circuited through slip rings
 (b) Rotor conductors are short-circuited through end rings
 (c) Rotor conductors are kept open
 (d) Rotor conductors are connected to insulation
461. DOL starting of induction motor is usually restricted to (A)
 (a) low horsepower motors (b) variable speed motors
 (c) high horsepower motors (d) high speed motors
462. The speed of a squirrel-cage induction motor can be controlled by all of the following except (C)
 (a) Changing supply frequency (b) changing number of poles
 (c) changing winding resistance (d) reducing supply voltage
463. Size of a high speed motor as compared to low speed motor for the same H.P. will be (B)
 (a) bigger (b) smaller
 (c) same (d) any of the above
464. Slip ring motor is recommended where (D)
 (a) Speed control is required
 (b) frequent starting, stopping and reversing is required
 (c) high starting torque is needed
 (d) all above features are required
465. As load on an induction motor goes on increasing (D)
 (a) Its power factor goes on decreasing (b) its power factor remain constant
 (c) its power factor goes on increasing even after full load
 (d) its power factor goes on increasing upto full load and then it falls again

466. If a 3-phase supply is given to the stator and rotor is short circuited rotor will move (B)
 (a) in the opposite direction as the direction of the rotating field
(b) in the same direction as the direction of the field
 (c) in any direction depending upon phase sequence of supply
 (d) with synchronous speed
467. A 3-phase slip ring motor has (B)
 (a) double cage rotor **(b)** would rotor
 (c) short-circuited rotor (d) any of the above
468. The torque developed in an induction motor is nearly proportional to (C)
 (a) $\frac{1}{V}$ (b) V
(c) V^2 (d) $\frac{1}{V^2}$
469. Short-circuit test on an induction motor cannot be used to determine (A)
(a) Windage losses (b) copper losses
 (c) transformation ratio (d) power scale of circle diagram
470. In case of 3-phase induction motor plugging means (D)
 (a) Pulling the motor directly on line without a starter
 (b) Locking of rotor due to harmonics
 (c) Starting the motor on load which is more than the rated load
(d) Interchanging two supply phases for quick stopping
471. The starting torque of the slip ring induction motor can be increased by adding (B)
 (a) external inductance to the rotor **(b)** external resistance to the rotor
 (c) external capacitance to the rotor (d) both resistance and inductance to rotor
472. A 500 kW, 3-phase, 440 volts, 50 Hz, A.C. induction motor has a speed of 960 r.p.m. on full load. The machine has 6 poles. The slip of the machine will be (D)
 (a) 0.01 (b) 0.02
 (c) 0.03 **(d)** 0.04
473. The complete circle diagram of induction motor can be drawn with the help of data found from (D)
 (a) No-load test (b) blocked rotor test
 (c) stator resistance test **(d)** all of the above
474. When R_2 is the rotor resistance, X_2 the rotor reactance at supply frequency and s the slip, then the condition for maximum torque under running condition will be (C)
 (a) $sR_2X_2 = 1$ (b) $sR_2 = X_2$
(c) $R_2 = sX_2$ (d) $R_2 = s^2X_2$
475. The low power factor of induction motor is due to (D)
 (a) Rotor leakage reactances (b) stator reactance
 (c) the reactive lagging magnetizing current necessary to generate the magnetic flux
(d) all of the above

476. For driving high inertia loads best type of induction motor suggested is (A)
☒ (a) Slip ring type (b) squirrel cage type
 (c) any of the above (d) none of the above
477. In a squirrel cage motor the induced e.m.f. if (C)
 (a) depended on the shaft loading (b) dependent on the number of slots
☒ (c) slip times the stand still e.m.f. induced in the rotor (d) none of the above
478. Less maintenance trouble are experienced in case of (B)
 (a) Slip ring induction motor ☒ (b) squirrel cage induction motor
 (c) both (a) and (b) (d) none of the above
479. Reduced voltage starter can be used with (C)
 (a) Slip ring motor only but not with squirrel cage induction motor
 (b) Squirrel cage induction motor only but not with slip ring motor
☒ (c) Squirrel cage as well as slip ring induction motor
 (d) None of the above
480. Slip ring motor is preferred over squirrel cage induction motor where (A)
☒ (a) high starting torque is required (b) load torque is heavy
 (c) heavy pull out torque is required (d) all of the above
481. In a star delta starter of an induction motor (D)
 (a) Resistance is inserted in the stator (b) reduced voltage is applied to the stator
 (c) resistance is inserted in the rotor circuit
☒ (d) applied voltage per stator phase is 57.7% of the line voltage
482. The torque of an induction motor is (A)
☒ (a) directly proportional to slip (b) inversely proportional to slip
 (c) proportional to the square of the slip (d) none of the above
483. The rotor of an induction motor runs at (B)
 (a) Synchronous speed ☒ (b) below synchronous speed
 (c) above synchronous speed (d) any of the above
484. The efficiency of an induction motor is than that of a transformer. (A)
☒ (a) Lower (b) higher
 (c) either of the above (d) none of the above
485. The advantage of a slip-ring induction motor over a squirrel cage induction motor is that (C)
 (a) It has higher efficiency (b) it has higher power factor
☒ (c) it can be started with the help of rotor resistance starter
 (d) none of the above
486. The magnetizing current drawn by induction motors and transformers is the cause of their power factor. (B)
 (a) leading ☒ (b) lagging
 (c) unity (d) zero

487. The synchronous speed of a 3-phase induction motor is given by the formula
 (a) $N_s = \frac{120f}{P}$ (b) $N_s = \frac{120P}{f}$ (A)
 (c) $N_s = 120 f P$ (d) $N_s = \frac{fP}{120}$
488. The rotor of an induction motor cannot run with synchronous speed because
 (a) Lenz's law would be violated (C)
 (b) induction motor would then become synchronous motor
 (c) rotor torque would then become zero
 (d) air friction prevents it to do so
489. When a load on a squirrel-cage induction motor is increased from no-load to full-load, which of the following statement is incorrect? (B)
 (a) Slip increases
 (b) The magnetizing component of the stator exciting current is increased
 (c) Stator power factor is improved
 (d) Torque developed by the motor increases till it equals the applied torque
490. If there is an open circuit in the rotor of a squirrel cage induction motor (D)
 (a) rotor will overheat (b) line fuses will blow
 (c) motor will be noisy (d) motor will not start
491. The number of slip rings on a squirrel cage induction motor is (D)
 (a) Four (b) three
 (c) two (d) none
492. What is the advantage of the double squirrel cage rotor as compared to the round bar cage rotor? (C)
 (a) The slip of the motor is larger (b) the efficiency of the motor is higher
 (c) the starting current of the motor is lower (d) the power factor of the motor is higher
493. Direction of rotation of a split phase motor can be reversed by reversing the connection of (C)
 (a) Running winding only (b) starting winding only
 (c) either (a) and (b) (d) both (a) and (b)
494. A universal motor can run on (C)
 (a) A.C. only (b) D.C. only
 (c) either A.C. or D.C. (d) none of the above
495. In a ceiling fan employing capacitor run motor (C)
 (a) Secondary winding surrounds the primary winding
 (b) Primary winding surrounds the secondary winding
 (c) Both are usual arrangements (d) none of the above
496. Which of the following motors is used for unity power factor? (B)
 (a) Hysteresis motor (b) Schrage motor
 (c) universal motor (d) reluctance motor

497. Speed control of a universal motor is achieved by (D)
 (a) Varying field flux with tapped field windings
 (b) Connecting rheostat in series
 (c) Applying variable voltage by means of silicon controlled rectifier
(d) All of the above methods
498. Shading coils, in case of a shaded pole motor, are used to (D)
 (a) Protect against sparking (b) reduce windage losses
 (c) reduce friction losses **(d)** produce rotating magnetic field
499. For ceiling fans generally the single phase motor used is (C)
 (a) Capacitor start type (b) split-phase type
(c) permanent capacitor type (d) capacitor start and run type
500. Skew is used in induction motors in order to reduce torque due to (C)
 (a) Time harmonics (b) space harmonics
(c) slot harmonics (d) reverse rotating fields
501. A 3-phase stator and rotor winding of a slip-ring induction motor is fed by 3-phase ac supply at a frequency f . If the rotor speed is N_r and synchronous speed is N_s , then the absolute speed of resultant flu in space is (A)
(a) N_s , irrespective of rotor speed N_r
 (b) $(N_s + N_r)$ if the flux rotates in the same direction as the rotor
 (c) $(N_s - N_r)$ if the flux rotates in the same direction as the rotor
 (d) N_r , irrespective of N_s
502. The approximate value of efficiency of a three-phase induction motor running at a slip 's' is given by (C)
 (a) $\frac{1}{1+s}$ (b) $\frac{s}{1+s}$
(c) $\frac{1-s}{1+s}$ (d) $\frac{s}{1-s}$
503. A 3-phase induction motor requires a stator (C)
 (a) because there is no back emf induced in the stator winding during starting
 (b) because the motor does not possess an inherent starting torque
(c) because the induced secondary voltage and hence the currents in the windings are abnormally high during starting
 (d) to increase the starting torque
504. Under no-load condition power drawn by the prime mover of an alternator goes to (B)
 (a) produce induced emf in armature winding **(b)** meet no-load losses
 (c) produce power in armature
 (d) meet Cu losses both in armature and rotor windings
505. An alternator running at 1000 rpm generates voltage at 50 Hz. The number of poles on the alternator will be (C)
 (a) 2 (b) 4
(c) 6 (d) 8

506. As the speed of an alternator increases, the frequency (A)
☒ (a) increases (b) decreases
 (c) remains constant
 (d) may increase or decrease depending on the power factor
507. An alternator is said to be overexcited when it is operating at (B)
 (a) Unity power factor ☒ (b) leading power factor
 (c) lagging power factor (d) either lagging or leading power factor
508. In an alternator, when the load increases, due to armature reaction the terminal voltage (D)
 (a) Drops (b) rises
 (c) remains unchanged ☒ (d) may drop or rise
509. The necessary condition for parallel operation of two alternators is (D)
 (a) Terminal voltage should be same (b) frequency should be same
 (c) phase sequence should be the same ☒ (d) all of these
510. The nominal speed of 50 Hz, 3-phase turbo-alternator in rpm is (D)
 (a) 600 (b) 1200
 (c) 1800 ☒ (d) 3000
511. An alternator has rated field current of 2A. This alternator is developing 200 V at a field current of 1 A at rated speed. If its field current is made 2A at rated speed, then the generated voltage would be (C)
 (a) 400 V (b) 380 V
☒ (c) less than 400 V (d) more than 400
512. The frequency of voltage generated in large alternators is (A)
☒ (a) 50 Hz (b) 60 Hz
 (c) in kilo cycles (d) in mega cycles
513. The speed of an alternator is changed from 3000 r.p.m. to 1500 r.p.m. The generated e.m.f./phase will become (B)
 (a) One fourth ☒ (b) half
 (c) double (d) unchanged
514. A stationary alternator should not be connected to a live bus-bar because it (A)
☒ (a) Will get short circuited
 (b) Will disturb generated e.m.fs of other alternators connected in parallel
 (c) Is likely to run as a synchronous motor
 (d) Will decrease bus-bar voltage though momentarily
515. The maximum current that can be supplied by an alternator depends on (B)
 (a) Exciter current ☒ (b) strength of the magnetic field
 (c) number of poles (d) speed of the exciter
516. The regulation of an alternator is (A)
☒ (a) The increase in terminal voltage when load is thrown off
 (b) The reduction in terminal voltage when alternator is loaded
 (c) The variation of terminal voltage under the condition of maximum and minimum excitation
 (d) The change in terminal voltage from lagging power factor to leading power factor

517. The advantage of salient poles in an alternator is (D)
 (a) Reduced winding loss (b) reduced bearing loads and noise
 (c) reduced noise
(d) adaptability of low and medium speed operation
518. Which of the following method is used to start a synchronous motor? (D)
 (a) Resistance starter in the armature circuit
 (b) Star-delta starter (c) damper winding
(d) damper winding in conjunction with star-delta starter
519. When running under no-load condition and with normal excitation, armature current I_a drawn by a synchronous motor (C)
 (a) Leads the back emf E_b by a small angle (b) is large
(c) lags the applied voltage V by a small angle
 (d) lags behind the resultant voltage E_R by 90°
520. When load on a synchronous motor running with normal excitation is increased, armature current drawn by it increases because (C)
 (a) back emf E_b becomes less than applied voltage V
 (b) power factor is decreased
(c) net resultant voltage E_R in armature is increased
 (d) motor speed is reduced
521. A synchronous running with normal excitation adjusts to increases in load essentially by increase in its (D)
 (a) power factor (b) torque angle
 (c) back emf **(d)** armature current
522. The back emf set up in the stator of a synchronous motor will depend on
 (a) rotor speed only **(b)** rotor excitation only (B)
 (c) both rotor speed and rotor excitation (d) coupling angle, rotor speed and excitation
523. In a synchronous motor, the torque angle is the (A)
(a) Angle between the rotating stator flux and rotor poles
 (b) Angle between meanetising current and back emf
 (c) Angle between the supply voltage and the back emf
 (d) None of these
524. Hunting in synchronous motor takes place when (D)
 (a) Friction in bearings is small (b) air gap is small
 (c) load is constant **(d)** load is variable
525. Which of the following motors is most suited for driving a clock? (D)
 (a) dc series motor (b) single phase capacitor start motor
 (c) 3-phase induction motor **(d)** 3-phase synchronous motor
526. In a synchronous motor, which of the following losses do not vary with load?
 (a) Copper losses (b) hysteresis losses (D)
 (c) windage losses **(d)** none of these

527. The merit of synchronous motor over induction motor is that (D)
 (a) It runs at a constant speed
 (b) it can run over a wide range of power factors both lagging and leading
 (c) its torque is less sensitive to change in supply frequency
(d) all of these
528. Speed of synchronous motor depends upon (C)
 (a) number of poles (b) supply frequency
(c) both (a) and (b) above (d) none (a) and (b) above
529. Synchronous motors are not self starting because (D)
 (a) stator is not used (b) starting winding is not provided
 (c) there is no slip
(d) the direction of instantaneous torque on the rotor reverse after half cycle
530. Under steady-state working conditions of a synchronous motor and an alternator, the relative speed between the magnetic fields of stator and rotor should respectively be
 (a) Zero, synchronous speed n_s (b) n_s , n_s (C)
(c) zero, zero (d) n_s , zero
531. A three-phase synchronous motor will have (B)
 (a) No slip- rings **(b)** one slip-rings
 (c) two slip-rings (d) three slip-rings
532. When V is the applied voltage, then the breakdown torque of a synchronous motor varies as (A)
(a) V (b) $V^{3/2}$
 (c) V^2 (d) $1/V$
533. The power developed by a synchronous motor will be maximum when the load angle is (A)
(a) Zero (b) 45°
 (c) 90° (d) 120°
534. A synchronous motor can be used as a synchronous capacitor when it is (A)
(a) Under-loaded (b) over-loaded
 (c) under-excited (d) over-excited
535. Synchronous motor always runs at (A)
(a) the synchronous speed (b) less than synchronous speed
 (c) more than synchronous speed (d) none of the above
536. An over-excited synchronous motor takes (A)
(a) Leading current (b) lagging current
 (c) both (a) and (b) (d) none of the above
537. For V-curves for a synchronous motor the graph is drawn between (A)
(a) field current and armature current (b) terminal voltage and load factor
 (c) power factor and field current (d) armature current and power factor

538. The back e.m.f. of a synchronous motor depends on (C)
 (a) Speed (b) load
☒ (c) load angle (d) all of the above
539. A synchronous motor can be made self starting by providing (D)
 (a) Damper winding on rotor poles (b) damper winding on stator
 (c) damper winding on stator as well as rotor poles ☒ (d) none of the above
540. The rotor copper losses, in a synchronous motor are met by (A)
☒ (a) d.c. source (b) armature input
 (c) motor input (d) supply lines
541. Synchronous motors are (A)
☒ (a) not self starting (b) self starting
 (c) essentially self starting (d) none of the above
542. An over-excited synchronous motor is used for (D)
 (a) Fluctuating loads (b) variable speed loads
 (c) low torque loads ☒ (d) power factor corrections
543. Which of the following methods is used to start a synchronous motor? (C)
 (a) Damper winding (b) star-delta starter
☒ (c) damper winding in conjunction with star-delta starter
 (d) resistance starter in the armature circuit
544. If the load of a synchronous motor is increases while keeping the field excitation constant, then (C)
 (a) power factor will increase and power angle will decrease
 (b) power factor will decrease and power angle will increase
☒ (c) both power factor and power angle will increase
 (d) both power factor and power angle will decrease
545. A synchronous motor runs at only one speed (i.e. synchronous speed) because it ... (B)
 (a) has no losses ☒ (b) is a doubly fed machine
 (c) has a damper winding (d) none of the above
546. Synchronous motors are generally used in applications requiring (A)
☒ (a) infrequent starting (b) variable speed
 (c) sudden application of heavy loads (d) frequent stopping
547. If load angle of a 4-pole synchronous motor is 8° (elect.), its value in mechanical degrees is (A)
☒ (a) 4 (b) 2
 (c) 0.5 (d) 0.25
548. Synchronous capacitor is (C)
 (a) an ordinary static capacitor bank
 (b) an over-excited synchronous motor driving mechanical load
☒ (c) an over-excited synchronous motor running without mechanical load
 (d) none of the above

549. Relative permeability of a paramagnetic material is (C)
 (a) one (b) less than one
(c) little more than one (d) several hundred
550. The following material is particularly suitable for use in standard resistance coils and in instrument shunts (C)
 (a) nichrome (b) graphite
(c) manganin (d) alnico
551. The main purpose of tempering hardened steel is to increase its (A)
(a) ductility (b) hardness
 (c) carbon content (d) grain size
552. A germanium atom contains (C)
 (a) 2 orbiting electrons (b) two protons
(c) four valence electrons (d) six valence electrons
553. A silicon atom contains (C)
 (a) 2 valence electrons (b) 2 protons
(c) 4 valence electrons (d) 6 valence electrons
554. The valence electrons are (A)
(a) Free electrons (b) outer orbit electrons
 (c) inner core electrons (d) located in the nucleus
555. Which of the following is not electromagnetic in nature? (D)
 1. alpha raya
 2. X-rays
 3. gamma rays
 4. cathode rays
 select the correct answer using the codes given below:
 (a) 1 and 2 rays (b) 2 and 3 only
 (c) 3 and 3 only **(d)** 1 and 4 only
556. Permeability of free space equals (B)
 (a) $4\pi \times 10^{-9} \text{ Hm}^{-1}$ **(b)** $4\pi \times 10^{-7} \text{ Hm}^{-1}$
 (c) $\pi \times 10^{-9} \text{ Hm}^{-1}$ (d) $4\pi \times 10^{-7} \text{ Hm}^{-2}$
557. Relative permeability μ_r of a medium is the permeability relative to (B)
 (a) air **(b)** free space
 (c) water (d) mercury
558. The most important use of soft magnetic materials is in (C)
 (a) Meters (b) transducers
(c) transformers and machine cores (d) transformer winding wire
559. Two wires A and B of the same material and lengths L and 2L have radius r and 2r respectively. The ratio of their specific resistance will be (A)
(a) 1:1 (b) 1:2
 (c) 1:4 (d) 1:8

560. When the heating coil in 1000 watt heater is reduced to half its length, the power consumed will be (C)
 (a) 1000 watts (b) 500 watts
(c) 2000 watts (d) 4000 watts
561. Order of resistivity of silver is (C)
 (a) Pico-ohm-metre (b) milli-ohm metre
(c) nano-ohm metre (d) micro-ohm metre
562. A germanium atom contains (A)
(a) four valence electrons (b) six valence electrons
 (c) four protons (d) six protons
563. When a pure semiconductor is heated (B)
 (a) its resistance increases **(b)** its resistance decreases
 (c) its atomic structure changes (d) it becomes metal
564. Valence electrons are (C)
 (a) found in the nucleus (b) the inner core electrons of an atom
(c) the outer orbit electrons (d) always free electrons
565. In a pure semiconductor, electric current is due to (C)
 (a) holes alone (b) electrons alone
(c) both holes and electrons (d) valence electrons alone
566. Temperature coefficient of resistance in a pure semiconductor is (C)
 (a) zero (b) positive
(c) negative (d) dependent on size of specimen
567. When germanium is doped with pentavalent impurity, the resulting material is (B)
 (a) p-type semiconductor **(b)** n-type semiconductor
 (c) intrinsic semiconductor (d) no longer a semiconductor
568. When germanium is doped with trivalent impurity, the resulting material is (A)
(a) p-type semiconductor (b) n-type semiconductor
 (c) intrinsic semiconductor (d) no longer a semiconductor
569. A p-type semiconductor is (C)
 (a) positively charged (b) negatively charged
(c) electrically neutral (d) not used in semiconductor devices
570. An n-type semiconductor is (C)
 (a) positively charged (b) negatively charged
(c) electrically neutral (d) not used in semiconductor devices
571. A normal atom is one which (C)
 (a) always has an atoms core with a charge of +4
 (b) always has four valence electrons
(c) has equal numbers of electrons and protons
 (d) shares its electrons with other atoms.

572. When atoms are held together by the sharing of valence electrons (A)
☒ (a) they form a covalent bond
 (b) they always form a diamond lattice structure
 (c) the valence electrons are free to move away from the atom
 (d) such shared electron leaves a hole.
573. A reverse bias (B)
 (a) Lowers the potential barrier ☒ (b) raises the potential barrier
 (c) greatly increased the majority carrier current
 (d) greatly increased the minority-carrier current
574. A forward bias (B)
 (a) Reduces the minority-carrier current to zero
☒ (b) Lowers the potential barrier (c) Raises the potential barrier
 (d) Reduces the majority-carrier current to zero
575. Avalanche breakdown occurs when (C)
 (a) forward current becomes excessive (b) forward bias exceeds a certain value
☒ (c) reverse bias exceeds a certain value (d) the potential barrier is reduced to zero
576. A heat sink is used to (C)
 (a) heat the transistor to its maximum operating temperature
 (b) keep transistors warm when not in use
☒ (c) receive heat from the transistor and dissipate it to the surrounding air
 (d) receive heat from the surrounding air and deliver it to the transistor
577. A heat sink will dissipate heat more rapidly if (B)
 (a) its temperature is the same as the temperature of the surrounding air.
☒ (b) its surface area is increased
 (c) it is covered with a material having a high thermal resistance
 (d) it is kept away from air currents.
578. A zener diode (B)
 (a) has a high voltage characteristic
☒ (b) has a sharp breakdown at low reverse voltage
 (c) is useful as controlled rectifier
 (d) has a negative resistance
579. If the length of a wire of resistance R is uniformly stretched to n times its original value, its new resistance is (C)
 (a) nR (b) R/n
☒ (c) n^2R (d) R/n^2
580. A dc wattmeter essentially consists of (B)
 (a) two ammeters ☒ (b) a voltmeter and an ammeter
 (c) two voltmeters (d) a current and a potential transformer
581. High ac voltages are usually measured with (C)
 (a) Electrostatic voltmeters (b) voltmeter and current transformer
☒ (c) potential transformer and voltmeter (d) voltmeter and multiplier

582. A moving-coil instrument can be used to measure (C)
 (a) Low frequency a.c (b) high frequency a.c
(c) Direct current (d) d.c. and a.c both
583. The resistance of a field coil may be correctly measured by using (A)
(a) A voltmeter and an ammeter (b) schering bridge
 (c) a Kelvin double bridge (d) a Maxwell bridge
584. Which of the following instrument will be used to measure alternating current only? (C)
 (a) Moving-iron voltmeter (b) permanent-magnet type ammeter
(c) induction-type ammeter (d) moving iron (attraction type) ammeter
585. When connecting wattmeters to a load circuit consuming large current, it is necessary to use (C)
 (a) potential transformers (b) isolation transformers
 (c) power shunts **(d)** current transformers
586. Which of the following electrical equipment cannot convert ac into dc? (C)
 (a) diode (b) converter
(c) transformer (d) mercury arc rectifier
587. The electric device which blocks dc but allows ac is called (A)
(a) Capacitor (b) inductor
 (c) amplifier (d) transducer
588. Essential requirement of an electrical measuring instrument is that (C)
 (a) Its resistance should be low (b) it is always connected in series in the circuit
(c) its introduction into the circuit under measurement does not alter the circuit conditions and the power consumed by it for its operation is small
 (d) its resistance should be infinite
589. An electrical measuring instrument has sensitivity of 1000 ohms/volt. On 100 volt scale, this instrument will have internal resistance of (C)
 (a) 10Ω (b) $10^4\Omega$
(c) $10^5\Omega$ (d) 1000Ω
590. All meters used for measuring current, voltage and resistance are basically (C)
 (a) multimeters (b) voltmeters
(c) current meters (d) ohm meters
591. Precision measurement of resistances is generally carried out by (D)
 (a) Potentiometer method (b) CRO method
 (c) voltmeter-ammeter method **(d)** bridge method
592. The most efficient form of damping in an instrument is (A)
(a) Eddy current (b) fluid friction
 (c) air friction (d) none of these

593. One single-phase wattmeter operating on 230 V and 5A for 5 hours makes 1940 revolutions. Meter constant in revolutions is 400. The power factor of the load will be
 (a) 1 (b) 0.8 (B)
 (c) 0.7 (d) 0.6
594. A moving coil galvanometer is made into a d.c. ammeter by connecting (A)
 (a) a low resistance across the meter (b) a high resistance in series with the meter
 (c) a pure inductance across the motor (d) a capacitor in series with the meter
595. Rectifier instruments indicate (A)
 (a) rms value (b) average value
 (c) peak value (d) dc value
596. The multiplier and the meter movement in a voltmeter are always in (D)
 (a) Parallel (b) series
 (c) parallel-series (d) series-parallel
597. The function of a shunt in an ammeter is to (A)
 (a) by pass the current (b) increase the meter's resistance
 (c) decrease the voltage drop (d) increase the current in the coil
598. Meggar is an instrument for (C)
 (a) Measuring current (b) measuring voltage
 (c) testing insulation (d) measuring power
599. A current transformer (B)
 (a) Should have its secondary open while the primary is carrying current
 (b) Should never have its secondary open while the primary is carrying current
 (c) Is never used with the secondary circuit closed through ammeters, wattmeters, current coils or relay coils
 (d) May keep the secondary circuit closed without any serious trouble
600. If the secondary winding of current transformer is left open (B)
 (a) There will be no current in the primary (b) current transformer will blast
 (c) no damage will result
 (d) there will be only magnetizing component of current in the primary
601. In a wheatstone bridge, known resistances are correct to within $\pm 0.2\%$. the accuracy to which an unknown resistance can be measured is (C)
 (a) $\pm 0.2\%$ (b) $\pm 0.4\%$
 (c) $\pm 0.6\%$ (d) $\pm 0.8\%$
602. Two-wattmeter method can be used to measure the total power delivered to
 (a) Star connected load only (b) delta connected load only (C)
 (c) star as well as delta connected loads (d) star connected with neutral load
603. What happens if a voltmeter is connected like an ammeter in series with the load? (C)
 (a) Meter burns out (b) measurement gives too high value
 (c) an extremely high current flows (d) there is almost no current in the circuit

604. Transducer is a device which (B)
 (a) Converts one form of power into another (b) converts one form of energy into another
 (c) helps in measuring electrical signal (d) is similar to a transformer
605. A differential transformer is a (A)
 (a) variable inductance transducer (b) variable pressure transducer
 (c) constant displacement transducer (d) constant pressure transformer
606. Which of the following instruments may be used to measure very high frequency small current? (D)
 (a) Induction type instrument (b) moving coil galvanometer
 (c) electrodynamic ammeter (d) thermocouple type instrument
607. The primary current in a current transformer is dictated by (C)
 (a) the secondary burden (b) the core of the transformer
 (c) the load current (d) none of the above
608. A d.c voltmeter has a sensitivity of $1000 \Omega/\text{volt}$. When it measures half full scale in 100 V range, the current through the voltmeter will be (C)
 (a) 100 mA (b) 1 mA
 (c) 0.5 mA (d) 50 mA
609. The meter constant of energy meter is given by (B)
 (a) rev/kW (b) rev/kWh
 (c) rev/watt (d) rev/kWs
610. A single phase energy meter is operating on 230 V, 50 Hz supply with a load of 20 A for two hours at upf. The meter makes 1380 revolutions in that period. The meter constant is (B)
 (a) 695 rev/kWh (b) 150 rev/kWh
 (c) 0.15 rev/kWh (d) 1/150 rev/kWh
611. An ideal voltage source will charge an ideal capacitor (C)
 (a) in infinite time (b) exponentially
 (c) instantaneously (d) none of the above
612. A dynamometer type wattmeter responds to the (A)
 (a) average value of active power (b) average value of reactive power
 (c) peak value of active power (d) peak value of reactive power
613. Which of the following generating station has the minimum running cost? (A)
 (a) Hydro-electric station (b) nuclear power station
 (c) thermal power station (d) diesel power plant
614. One favourable economics factor in the transmission of power at high voltage is the (D)
 (a) decreased insulation required by the line (b) increased I^2R losses
 (c) smaller size of the generating station (d) reduction of conductor cross-section
615. Differential relays are installed to protect the equipment against (B)
 (a) reverse current (b) internal faults
 (c) overcurrents (d) no voltage

616. The EHV system is one operating beyond (D)
 (a) 11 kV (b) 132 kV
 (c) 200 kV (d) 400 kV
617. The advantage of dc systems over ac systems is (D)
 (a) Improved line regulation (b) no skin effect
 (c) no charging currents (d) all of these
618. Causes of low power factor are (D)
 (a) Induction motors are arc lamp loads (b) generating equipment during low loads
 (c) industrial heating furnaces and arc furnaces (d) both (a) and (c) above
619. Drawbacks of low power factor are (D)
 (a) High ratings of generating, transmitting and distributing equipment
 (b) Large voltage drop and poor voltage regulation
 (c) Large copper losses and high capital costs
 (d) All of these
620. Power factor of a power system can be improved by (D)
 (a) Using phase advances, static capacitors, capacitance boosters
 (b) Unexcited synchronous motors on load
 (c) Over excited synchronous motors on no load
 (d) Both (a) and (b) above
621. The function of guard ring transmission lines is (A)
 (a) to reduce the transmission losses
 (b) to reduce the earth capacitance of the lowest unit
 (c) to increase the earth capacitance of the lowest unit
 (d) none of these
622. Use of bundle conductors cause the critical voltage for corona formation (B)
 (a) to decrease (b) to increase
 (c) to remain unaltered (d) does not exist
623. Booster transformer is located at (C)
 (a) sending end of transmission line (b) receiving end of transmission line
 (c) intermediate point on a transmission line (d) none of these
624. The string efficiency of an insulator can be increased by (C)
 (a) Reducing the number of strings in the insulator
 (b) Increasing the number of strings in the insulator
 (c) Correct grading of insulators of various capacities
 (d) None of these
625. The topmost wire in a distribution line is (B)
 (a) neutral wire (b) earth wire
 (c) phase wire (d) any of these
626. Sheaths are used in power cables to (C)
 (a) provide adequate insulation (b) increase the strength of the cable
 (c) prevent moisture from entering the cable (d) none of these

627. Pin insulators are normally used for voltages upto (A)
 (a) 30 kV (b) 50 kV
 (c) 70 kV (d) 100 kV
628. For the same power transmission, if the transmitted voltage increases by factor n , the size of the conductor gets multiplied by factor (A)
 (a) $1/n^2$ (b) n^2
 (c) $1/n^3$ (d) n^3
629. Corona is observed on (C)
 (a) a.c. transmission lines only (b) d.c. transmission lines only
 (c) both a.c. and d.c. transmission lines (d) none of these
630. As per Indian Standards, the cross-sectional area of the neutral wire in a 3-phase 4 wire system is (D)
 (a) twice that of a phase conductor (b) equal to that of a phase conductor
 (c) half that of a phase conductor (d) one-fourth that of a phase conductor
631. Proximity effect is due to current flowing in the (C)
 (a) earth (b) sheath
 (c) neighbouring conductor (d) all of these
632. Guy is attached to a transmission line pole to (C)
 (a) reduce the sag (b) hold the telephone lines
 (c) strengthen the pole (d) none of these
633. The following medium is employed for extinction of arc in air break circuit breakers? (B)
 (a) Oil (b) air
 (c) water (d) none of these
634. Which of the following condition causes transient instability in power system? (D)
 (a) Short circuit (b) switching operations on the line
 (c) loss of excitation in a generator (d) all of these
635. Modern trend in rail electrification in India is to use which of the following supply system (A)
 (a) 25 kV, 50 Hz (b) 15 kV, 50 Hz
 (c) 6 kV, 50 Hz (d) 6 kV, dc
636. Rate of rise of restriking voltage depends (D)
 (a) Type of circuit breaker (b) inductance of the system only
 (c) capacitance of the system only (d) inductance and capacitance of the system
637. If the fault current is 2000 amps, the relay setting 50% and the C.T. ratio is 400/5, then the plug setting multiplier will be (D)
 (a) 25 amps (b) 45 amps
 (c) 50 amps (d) none of these
638. A large size alternator is protected against overloads by providing (B)
 (a) over current relays (b) temperature sensitive relays
 (c) thermal relays (d) none of these

639. Photo-voltaic cell produces electric energy from (A)
 (a) Electromagnetic energy (b) electrostatic energy
 (c) geothermal energy (d) both (a) and (b) above
640. Running cost of a power plant is based on the cost of (B)
 (a) Energy of fuel (b) consumable items
 (c) maintenance and operation (d) all of these
641. All types of tariffs must recover the cost of (B)
 (a) Capital investment in generating equipment
 (b) Operation, supplies and maintenance of equipment
 (c) Metering equipment, billing, collection costs, profit and wages
 (d) All of these
642. Factors involved in fixing tariffs are (D)
 (a) Secured return from each consumer
 (b) Simplicity, cheapness and easy explainability
 (c) Incentive to consumers and charge according to use
 (d) All of these
643. Depreciation rate is less in the case of (C)
 (a) Diesel engine plant (b) nuclear plant
 (c) hydro-electric plant (d) steam power plant
644. Drawbacks of low power factor are (C)
 (a) high ratings of generating, transmitting and distributing equipment
 (b) large voltage drop and poor voltage regulation
 (c) large copper losses and high capital costs
 (d) all of these
645. Diversity factor of a power system is the (A)
 (a) ratio of sum of consumer's maximum demands to maximum load on the station
 (b) ratio of average demand to maximum demand
 (c) reciprocal of (a) above
 (d) reciprocal of (b) above
646. The corona discharge on transmission lines may be avoided by (A)
 (a) Increasing effective conductor radius (b) increasing the operative voltage
 (c) decreasing the spacing between the conductors (d) none of these
647. Voltage gradient on a transmission line conductor is highest (A)
 (a) at the surface of the conductor (b) at the centre of the conductor
 (c) at the distance equal to one radius from the surface (d) none of these
648. On a transmission line, whenever the conductors are dead ended or there is change in the direction of transmission line, the insulators used are (A)
 (a) strain type (b) suspension type
 (c) pin type (d) none of these
649. As the height of a transmission tower is altered, the parameter which changes is (B)
 (a) Inductance (b) capacitance
 (c) conductance (d) none of these

650. For transmission line span of 21, horizontal tension at tower supports is T and weight of conductor/unit length is w. The maximum sag equals (A)
- (a) $\frac{2wl^2}{T}$ (b) $\frac{2wl^2}{2T}$
 (c) $\frac{wl}{2T}$ (d) $\frac{2wl}{T}$
651. Impedance relays can be used for (C)
- (a) Phase faults only (b) earth faults only
 (c) both phase and earth faults (d) none of these
652. The sag of a transmission line is affected by (C)
- (a) its own weight and weight of the ice formed (b) temperature and wind condition
 (c) both (a) and (b) above (d) none of these
653. In a power system, the rate of rise of restriking voltage depends upon (C)
- (a) switching condition only (b) circuit power factor only
 (c) both (a) and (b) above (d) none of these
654. Lightning arrestor should be located (B)
- (a) away from the circuit breaker (b) near the circuit breaker
 (c) away from the transformer (d) near the transformer
655. The voltage appearing across the contacts after the opening of the circuit breaker is called (B)
- (a) Surge voltage (b) recovery voltage
 (c) arc voltage (d) break open voltage
656. Air blast circuit breakers are preferred for (C)
- (a) Short duty (b) intermittent duty
 (c) repeated duty (d) none of these
657. For a 400 kV system, the capacity of lightning arrestor should be (C)
- (a) 1 kA (b) 5 kA
 (c) 10 kA (d) 50 kA
658. Basic quantity measured in a distance relay is (A)
- (a) Impedance (b) voltage difference
 (c) current difference (d) none of these
659. Directional relays respond to the (C)
- (a) Flow of current (b) voltage polarities
 (c) flow of power (d) all of these
660. Insulation of the modern EHV lines is designed based on (B)
- (a) Lighting voltage (b) switching voltage
 (c) corona (d) RI
661. Ferranti effect on long overhead lines is experienced when it is (A)
- (a) Lightly loaded (b) on full load at unity p.f.
 (c) on full load at 0.8 p.f. lag (d) in all these cases

662. Leakage resistance of a 50 km long cable is 1 MΩ for a 100 km long cable it will be (D)
 (a) 1 MΩ (b) 2 MΩ
 (c) 0.66 MΩ (d) none of these
663. Charging reactance of 50 km length of line is 1500Ω. The charging reactance for 100 km length of line will be (C)
 (a) 1500Ω (b) 3000Ω
 (c) 750Ω (d) 600Ω
664. For reducing tower footing resistance it is better to use (C)
 (a) chemical and ground rods only (b) chemical and counterpoise only
 (c) ground rod and counterpoise only (d) chemical, ground rods and counterpoise
665. The normal practice to specify the making current of a circuit breaker is in terms of (B)
 (a) r.m.s. value (b) peak value
 (c) average value (d) both r.m.s. and peak value
666. If the fault current is 2000 amps, the relay setting 50% and the C.T. ratio is 400/5, then the plug setting multiplier will be (D)
 (a) 25 amps (b) 45 amps
 (c) 50 amps (d) none of these
667. A large size alternator is protected against overloads by providing (B)
 (a) over current relays (b) temperature sensitive relays
 (c) thermal relays (d) none of these
668. The most vital factor against electric traction is the (D)
 (a) necessity of providing a negative booster (b) possibility of electric supply failure
 (c) high cost of its maintenance
 (d) high initial cost of laying out over-head electric supply system
669. The main reason for choosing the composite 1-phase ac to dc system for all future track electrification in India is that it (B)
 (a) needs less number of sub-stations
 (b) combines the advantages of high voltage ac distribution at 50 Hz with dc series traction motors
 (c) provides flexibility in the location of sub-stations
 (d) requires light overhead catenary
670. Tractive effort of an electric locomotive can be increased by (D)
 (a) Increasing the supply voltage (b) using high kW motors
 (c) increasing dead weight over the driving axles (d) both (b) and (c)
671. Welding is not done directly from the supply mains because (D)
 (a) It is customary to use welding machines (b) its voltage is too high
 (c) its voltage keeps fluctuating (d) it is impracticable to draw heavy currents
672. Spot welding process basically depends on (D)
 (a) Ohmic resistance (b) generation of heat
 (c) application of forging pressure (d) both (b) and (c)

673. The characteristics of drive for crane hoisting is (D)
 (a) Smooth movement (b) precise control
 (c) fast speed control (d) all of these
674. Ward-Leonard controlled d.c. drives are generally used for (C)
 (a) Light duty excavators (b) medium duty excavators
 (c) heavy duty excavators (d) all of these
675. A magnetic amplifier can be used for the control of (A)
 (a) Current (b) voltage
 (c) speed (d) all of these
676. In a contactor, overheating of contacts may result from (D)
 (a) high inductive loads (b) copper oxide on contacts
 (c) carrying load continuously for a longer time (d) all of these
677. Earth electrodes can be in the form of (D)
 (a) rods and pipes (b) strips
 (c) plates (d) all of these
678. Mixture preferred for filling around the earth for electrode effective earthing is (B)
 (a) bone-meat mixture (b) coal-salt mixture
 (c) saw-dust sand mixture (d) lime-sand mixture
679. Earthing is used as the return conductor for (D)
 (a) Telephone lines (b) telegraph lines
 (c) traction work (d) all of these
680. The various types of electric braking are (D)
 (a) Plugging (b) rheostatic braking
 (c) regenerative braking (d) all of these
681. The coefficient of adhesion is (C)
 (a) Same on a.c. and d.c. traction systems
 (b) high in case of d.c. traction and low in a.c. traction
 (c) low in case of a.c. traction and high in d.c. traction
 (d) none of these
682. The specific energy consumption (A)
 (a) Increases with increase in maximum speed
 (b) Decreases with increase in maximum speed
 (c) Is independent of maximum speed
 (d) None of these
683. TIG welding is (B)
 (a) Temperature insulated gas welding (b) tungsten inert gas welding
 (c) thermally induced gas welding (d) thorium iodine gas welding
684. When t is the thickness of the sheet, the tip diameter for spot welding is usually (C)
 (a) $2t$ (b) t
 (c) $\sqrt{t}$ (d) $\frac{1}{t}$

685. Which of the following is of high importance in case of induction heating?
 (a) Voltage (b) current (C)
(c) frequency (d) all of these
686. Quantities having the unit "lux" is (D)
 (a) Utilization factor (b) luminous flux
 (c) luminous intensity **(d)** illumination
687. In order to have lower cost of electrical energy generation (D)
 (a) The load factor and diversity factor should be low
 (b) The load factor should be low but diversity factor should be high
 (c) The load factor should be high but diversity factor low
(d) The load factor and diversity factors should be high
688. A string insulator has 4 units. The voltage across the bottom-most unit is 33.33% of the total voltage. Its string efficiency is (D)
 (a) 25% (b) 33.33%
 (c) 66.7% **(d)** 75%
689. The design of insulation for systems above 400kV, is based upon (B)
 (a) Lightning overvoltage **(b)** switching surges
 (c) system voltage level (d) system load level
690. In case of contactors, the contacts are generally made of (D)
 (a) Copper (b) silver
 (c) cadmium copper **(d)** all of these
691. When the speed of the train is estimated taking into account the time of stop at a station in addition to the actual running time between stops, is known as (B)
 (a) Average speed **(b)** schedule speed
 (c) notching speed (d) free running speed
692. An Ideal traction system should have (D)
 (a) High starting tractive effort (b) the locomotive is to run on metre gauge track
 (c) the locomotive is for shunting duty **(d)** the locomotives is for goods trains only
693. Thermal conductivity is least for (A)
(a) air (b) water
 (c) glass (d) copper
694. Desirable property of resistance heating element materials is (D)
 (a) high resistivity (b) high melting point
 (c) low temperature coefficient **(d)** all of these
695. The highest illumination is required (B)
 (a) For office work **(b)** for mounting of wrist watches
 (c) for sorting work in stores (d) for painting work
696. In India diesel locomotives are manufactured at (B)
 (a) Ajmer **(b)** Varanasi
 (c) Bangalore (d) Jamalpur

697. Electric locomotives in India are manufactured at (C)
(a) Jamalpur (b) Bangalore
(c) Chittranj (d) Gorakhpur
698. The normal value of adhesion friction is (D)
(a) 0.12 (b) 0.25
(c) 0.40 **(d)** 0.75
699. The resistance encountered by a train in motion is on account of (D)
(a) Resistance offered by air (b) friction at the track
(c) friction at various parts of the rolling stock **(d)** all of the above
700. The value of co-efficient of adhesion will be high when rails are (D)
(a) Greased (b) wet
(c) sprayed with oil **(d)** cleaned with sand

GENERAL KNOWLEDGE

1. what is the Head Quarters of South central Railway (A)
A) Secunderabad B) Mumbai C) Chennai D) Bangalore
2. what is the name of the river in Hyderabad (D)
A) Godavari B) Krishna C) Penna D) Musi
3. Charminar is Located at (C)
A)Warganal B) KURNOOL C)HYDERABAD D) Vijayawada
4. Who is the Governor of Andhrapradesh& Telangana States (A)
A)E.S.L.Narsimhan B) Dattatreya C) Kishan Reddy D) K. Srlhari.
5. The name of the woman Tennis Star Who belongs to Hyderabad is (B)
A) HAMPI B) Sania Mirza C) Midali Raj D) Karanam Laskmi.
6. Who is the president of INDIA (A)
A) Pranab Mukherji B) Manmohan singh C) Sarath pawar D) Nitish kumar.
7. Who is the prime minster of INDIA (B)
A)Venkaiah Naidu B) Narendra Modi C) Rahul Gandhi D) Molayam Yadav
8. The Festival of Christmas is Celebrated on (D)
A)January 25th B) April 25th C) OCTOBER 25TH D) December 25th
9. Whose Birth day we celebrate on October 2Nd (A)
A)Mahatma Gandhi B) Nehru C) Indra Gandhi D) Rajiv Gandhi
10. The Birth place of Mahatma Gandhi is (B)
A)Hyderabad B) Pour Bander C) Delhi D) Mumbai
11. Who is the writer of poem Sare Jahan se Accha Hindusitan hamara (C)
A) Kasim B) Kabir C) Muhammad Iqbal D) Rahim
12. The writer of National Anthem of INDIA Jana Gana Mana ? (A)
A) Rabindranath Tagore B) S.C.Bose C) Nehru D) C.Narayana Reddy
13. Which city Located on the banks of river Hoogly (A)
A) Kolkata B) Delhi C) Mumbai D) JAIPUR
14. Which award is given to the coaches of Sportspersons? (A)
A) Dronacharya award B) savyasachi award C) Keshav Award D) Champion Award.

15. The Chief Minister of Telangana state (A)
A) K.Chandrasekhar Rao B) T.Harish Rao C) K.T.Rama Rao D) T.Srinivas Yadav
16. The Chief Minister of Andhrapradesh (A)
A) N.Chandrababu Naidu B) K.E.Krishana murthy C) Y.S.Jagan Mohan Reddy D) N.Balakrishna.
17. Who is the First Woman President of INDIA (C)
A) Vijayalakshmi pandit B) Sheela Dikshit C) Prathiba patil D) Sonia Gandhi
18. The Parliament Bhavan situated at (A)
A) NewDelhi B) Kolkata C) Mumbai D)Chennai
19. Which Telugu movie won National film fare Award (C)
A) Srimanthudu B) Gopala Gopala C) Bahubali D) Gabber Singh
20. Where The Lord Venkateswara swami Seven Hills situated at (A)
A)Tirupathi B) Kadapa C) Kurnool D) Hyderabad
21. Golkonda Fort Situated at Ans (A)
A) Hyderabad B) Vizag C) Vijayawada D) Warangal
22. The capital of Rajasthan Ans (C)
A) Udaipur B) Jodhpur C) Jaipur D) Mount Abu
23. The Famous Dilwara Temples located at Ans (A)
A)Mount Abu B) Kolkata C) New Delhi D) Mumbai
24. The speaker of Andhra Pradesh Assembly Ans (B)
A) N.Chandra Babu Naidu B) Dr. K.Siva Prasad C) Y.JaganMohan Reddy D) Smt. P.Sujatha
25. Which is International Yoga Day? Ans (A)
A) June 21 B) March 22 C) September 22 D) December 23
- 26) What is the formation Day of Telengana Ans (A)
A)02.06.2014 B) 02.07.2014 C) 02.09.2014 D) 02.10.2014
- 27) The oldest Stock Exchange of India is (C)
A) Bangalore Stock Exchange B) Ahmedabad Stock Exchange
C) Bombay Stock Exchange D) Hyderabad St5ock Exchange
- 28) Which of the following describes India as a secular State ? (C)
A) Fundamental Rights B) Ninth Schedule
C) Preamble to the Constitution D) Directive Principles
- 29) Land of Midnight Sun is (C)
A) Japan B) Finland C) Norway D) Canada

- 30) The Head quarters of International Labour Organisation (C)
A) New York B) London C) Geneva D) Rome
- 31) The Head quarters of United Nations International Children's Emergency Fund (D)
(UNICEF)
A) London B) Berne C) Paris D) New York
- 32) Headquarters of International Crime Police (INTERPOL) (B)
A) Geneva B) Paris C) New York D) Rome
- 33) Head quarters of Red Cross (A)
A) Geneva B) Norway C) Berne D) Montreal
- 34) The Highest Award in India (D)
A) Padma Bhushan B) Jnanpith C) Arjun D) Bharat Ratna
- 35) The Longest River in India (B)
A) The Godavari B) The Ganges C) The Krishna D) The Yamuna
- 36) The largest populated City in India (C)
A) Kolkata B) Hyderabad C) Mumbai D) Bangalore
- 37) The largest State in India (Area) (A)
A) Rajasthan B) Uttar Pradesh C) Punjab D) Tamil Nadu
- 38) The Largest State in terms of population in India (D)
A) Rajasthan B) Bihar C) Kerala D) Uttar Pradesh
- 39) The Biggest Cave Temple in India (B)
A) Ajantha B) Ellora C) Elephenta D) Dilwara
- 40) The Tallest Statue in India (C)
A) The Statue of Buddha B) The Statue of Gandhi
C) The Statue of Gomateswar D) The Statue of Ambedkar
-
- 41) The Largest Dam in India (B)
A) TheBakra Nangal Dam B) Hirakud Dam C) Nagarjuna Sagar D) Tehri Dam
- 42) The largest Public Sector Bank (D)
A) Andhra Bank B) Bank of India C) Syndicate Bank D) State Bank of India
- 43) The smallest State in Area (A)
A) Goa B) Assam C) Uttarakhand D) Delhi
- 44) The smallest state in Population (C)
A) Assam B) Goa C) Sikkim D) Meghalaya

- 45) The largest port in India (A)
A) Mumbai B) Krishnapatnam C) Kolkata D) Vishakhapatnam
- 46) The largest River in India (B)
A) Krishna B) Ganga C) Godavari D) Yamuna
- 47) The longest Railway Platform in India is situated at (C)
A) New Delhi B) Kolkata C) Kharagpur D) Mumbai
- 48) The Highest Air port in India (D)
A) Jammu B) Siachin C) Gwalior D) Leh(Laddakh)
- 49) The longest Dam in India (D)
A) Bakranangal Dam B) Nagarjuna Sagar Dam C) Tehri Dam D) Hirakud Dam
- 50) Total No. of states in India (A)
A) 29 B) 30 C) 28 D) 27
- 51) The capital city of Punjab (B)
A) Amritsar B) Chandigarh C) Ludhiana D) Patiala
- 52) The capital city of Uttarakhand (A)
A) Dehradun B) Manali C) Rampur D) Kulu
- 53) The capital city of Sikkim (C)
A) Kohima B) Dimapur C) Gangtok D) Ludhiana
- 54) The capital city of Jharkhand (D)
A) Jamshedpur B) Tatanagar C) Indore D) Ranchi
- 55) The capital city of Arunachal Pradesh (B)
A) Dispur B) Itanagar C) Panaji D) Imphal
- 56) Total No. of Union Territories in India (C)
A) 09 B) 10 C) 07 D) 06
- 57) The largest city in Madhya Pradesh (A)
A) Indore B) Bhopal C) Jhansi D) Vadodara
- 58) The Official language of the State of Nagaland (B)
A) Hindi B) English C) Manipuri D) Khasi
- 59) The capital city of Goa (A)
A) Panaji B) Vasco C) Guwahati D) Faridabad
- 60) The largest city in Uttar Pradesh (C)
A) Lucknow B) Banaras C) Kanpur D) Amedhi

- 61) The Chief Minister of Tamilnadu state (B)
A) Karuna nidhi B) Jayalalitha C) capt .vijayakant D) Sasikala
- 62) The Chief Minister of Bihar (D)
A) Lalu Prasad Yadav B) Sarad Pawar C) Akhilesh Yadav D) Nitish Kumar
- 63) The Chief Minister of Gujarat (A)
A) Anandi Ben Patel B) Narendra Modi C) Amit shah D) Naveen Patnaik
- 64) The Chief Minister of Maharashtra (C)
A) Shivraj Singh Chouhan B) Mukul sangma C) Devendra Fadnavis D) K.T.Rama Rao
- 65) The Chief Minister of Jammu & Kashmir (B)
A) Harish Rawat B) Mahabooba Mufti C) Mamata Banerjee D) Jayalalitha
- 66) The Chief Minister of Rajasthan (D)
A) Prakash singh Badal B) Akhilesh Yadav C) Oomen Chandy D) Vasundhara Raje
- 67) The Governor of Manarashtra (B)
A) K.Rosaiah B) Ch.Vidya Sagar C) Kalyan Singh D) S.C.Jamir
- 68) The C.M. of West Bengal state (A)
A) Mamata Banerjee B) Kiran bedi C) Roopa Ganguly D) Kokana sen
- 69) The governor of west Bengal (C)
A) Krishn Kant Paul B) Mridula Sinha C) Keshari Nath Tripathi D) Nirbhay Sharma
- 70) The governor of Meghalaya (D)
A) P.Sadasivam B) S.C.Jamir C) Acharya Devvrat D) V.Shanmuganthan
- 71) The Chief Minister of Delhi (D)
A) N.Rangaswamy B) Manik Sarkar C) Harish Rawat D) Arvind Kejriwal
- 72) The governor of Puducherry (B)
A) Vijay Kumar B) A.K.Singh C) Ashish Kundra D) Kaptain Singh solanki
- 73) The governor of Delhi (C)
A) Ram Naik B) Kalyan Singh C)Najeeb Jung D) Vijay Kumar
- 74) The governor of Tamil Nadu (C)
A) Jayalalitha B) Karunanidhi C) K.Rosaiah D) Stalin
- 75) The governor of Kerala (B)
A) Oomen Chandi B) P.Sathasivam C) Mukul Sangma D) Naveen Patnaik

- 76) Who is Home Minister of Government of India (A)
A) Rajnath Singh B) Suresh Prabhu C) Venkaiah Naidu D) Sushma Swaraj
- 77) Who is Minister for Railways (D)
A) Sushma Swaraj B) Amit Shah C) Arun Jaitley D) Suresh Prabhu
- 78) Who is the Finance Minister of India (B)
A) Nitin Gadkari B) Arun Jaitley C) Smriti Irani D) Sadananda Gowda
- 79) The President of India in 1977 (D)
A) Pratibha Patil B) Sankar Dayal Sharma C) Hamid Ansari D) Neelam Sanjiva Reddy
- 80) The Nightingale of India, (C)
A) Kamala Gandhi B) Dr.Najma Heptullah C) Sarojini Naidu D) Vijayalaxmi Pandit
- 81) The Founder of Ramakrishna Mission ? (D)
A) Radhakant Dev B) Ram Mohan Roy C) Ramakrishna Paramhans D) Swami Vivekananda
- 82) The Longest River in the World is (A)
A) Nile B) Ganga C)Amazon D) Mississippi Misouri
- 83) In Which Place Rock Graden located (C)
A) Lucknow B) Mumbai C) Chandigarh D) Ahmedabad
- 84)The Number of Chromosomes in the nuclei of Human being is (B)
A) 23 B)46 C)44 D) 48
- 85)The Largest Muscle in Human body lies in (B)
A) Hands B)Hip C) Neck D) Leg
- 86) Lord Buddha got Nirvana at (A)
A)Bodh Gaya B) Lubini C) Sarnath D) Kushinagar
- 87)who was the only muslim lady to occupy the throne of Delhi ? (B)
A) Nurjahan B) Raziya Sultan C) Muntaj Mahal D) Hamidabanu Begum
- 88) In which state Panchayat Rai was first implemented ? (C)
A) Gujarat B) Bihar C) Rajasthan D)Uttar Pradesh
- 89) Who is the Father of Indian Constitution ? (D)
A) B.N.Roy B) N.G.Ayengar C) DR.Rajendra Prasad D) DR. B.R.Ambedkar
- 90) Siachen is a (A)
A) Glacier B) Mountain C) River D) Valley

- 91) The Biggest Employer in INDIA is (B)
A) Army B) Indian Railways C) LIC D) State Bank of India
- 92) How many Zones are there in Indian Railways (C)
A) 20 B) 18 C) 16 D) 15
- 93) The National Rail Museum is located at (D)
A) Hyderabad B) Kolkata C) Mumbai D) New Delhi
- 94) First underground Railway (B)
A) Mumbai Metro B) Kolkata Metro C) Delhi Metro D) Bangalore Metro
- 95) The busiest Railway Station in India (C)
A) Hyderabad B) Mumbai C) Howrah D) New Delhi
- 96) The train between India and Pakistan (A)
A) Samjhauta Express B) Himasagar Express C) Vivek Express D) Rapthisagar Express
- 97) The Headquarters of Indian Railways (C)
A) Bhubaneswar B) Hyderabad C) New Delhi D) Chennai
- 98) No. of divisions in South Central Railway (D)
A) 05 B) 04 C) 09 D) 06
- 99) The Highest Railway Station in India (A)
A) Ghum Railway Station B) Ooty C) Shimla D) Ahju
- 100) The world's longest Railway Platform is at (B)
A) Kollam B) Gorakhpur C) Kharagpur D) Bilaspur
- 101) The study of universe is known as ? (A)
A) Cosmology B) Galaxy C) Milky way D) Orbit
- 102) which is biggest planet ? (C)
A) Moon B) Earth C) Jupiter D) Mercury
- 103) which planet known as Red Planet ? (B)
A) Pluto B) Mars C) Venus D) Mercury
- 104) Study of Earth quakes called as ? (D)
A) Primary wave B) Surface wave C) Secondary wave D) Seismology
- 105) Vizag affected by Which cyclone ? (B)
A) Maysak B) Hudhud C) Noul D) Haiyan

- 106) Light Year is the unit of measurement of ? (B)
A) speed of light B) Distance between stars C) Time D) None of the above
- 107) The most appropriate unit to measure thickness of coin is ? (A)
A) Millimeter B) Centimeter C) Meter D) Decimeter
- 108) Which two metals will be attracted by a magnet? (A)
A) Iron and Steel B) Gold and Silver C) Aluminum and lead D) Wood and Iron
- 109) The Father of the Indian nuclear programme ? (B)
A) C.V. Raman B) Homi Jehangir Bhabha C) Radha Krishna D) None of the above
- 110) The Indian space research organization in AP ? (C)
A) Vijayawada B) Kurnool C) Sriharikota D) Tirupati
111. What are called primary colors? (C)
A) White, blue, pink B) Purple, black, white C) Red, Green and Blue D) None of the above
- 112) 2016-17 Railway budget, the percentage of lower berth quota for senior citizens is (D)
A) 10% B) 20% C) 30% D) 50%
- 113) One rupee note signed by (B)
A) RBI Governor B) Finance Secretary C) chief minister D) Speaker
- 114) The No. of Languages on Rs 100 note are? (C)
A) 1 B) 5 C) 15 D) 10
- 115) Which country's Prime minister Residence is called as 7 race course ? (C)
A) British B) Bharat C) Nepal D) Japan
- 116) First game played at Space ? (C)
A) Hockey B) cricket C) Chess D) Tennis
- 117) Revolutions list
1. Black revolution - Petroleum production
2. Blue Revolution ; - Fish production
3. Golden Revolution ; - Fruits and Overall Horticulture development and Honey production
4. Green Revolution ; - Food Grains
5. Silver Revolution ; - Eggs and poultry Revolution
- 118) The number of Members nominated for Rajya Sabha by president of India ? (D)
A) 10 B) 8 C) 6 D) 12
- 119) Two members nominated by president for Lok Sabha belongs to which community ? (C)
A) Jain B) Hindu C) Anglo- Indian D) Sikh

- 120) Which district of Telangana famous for Nirmal paintings ? (A)
A) Adilabad B) Rangareddy C) Medak d) karimnagar
- 121) Hyderabad is famous for ? (B)
A) Cloths B) pearls C) JUTE products D) Watches
- 122) MMTS Suburban rail system operated at ? (C)
A) Kolkata B) Bangalore C) Hyderabad D) PUNE
- 123) New capital city of Andhar pradesh ? (B)
A)Kurnool B) Amaravati C) GUNTUR D) Nellore
- 124) which place receive first monsoon rains in India ? (A)
A) Kerala B) Mumbai C) Chennai D) Punjab
- 125) The Author of Wings of Fire ? (C)
A) Chatan bhagat B) Sudha murthy C) A.P.J.A.Kalam D) None of the above
- 126) Which city was the summer capital of India during British Rule ? (B)
A) Ooty B) Simla C) panmarchi D) Matheran
- 127) Which state is known as India's Spice Garden ? (D)
A) Karnataka B) Bihar C) Uttarakhand D) Kerala
- 128) Name the annual fair of Rajasthan that is famous for its Camel trading event ? (A)
A) puskkar Mela B) Kumbha Mela C) Sonapur Mela D) Suraj Kund Mela
- 129) Saina nehwal is a famous ---- player ? (C)
A) Tennis B) Golf C) Badminton D) Cricket
- 130) Numismatics is the study of ? (A)
A) Coins B) Numbers C) Stamps D) Space
- 131) Who is Known as the Iron man of India ? (C)
A) Jawaharlal Nehru B) Bal Gangadhar Tilak C) Sardar Vallabhai patel D)Mahatma Gandhi
- 132) who worked for the welfare of Deaf , dumb and blind persons ? (A)
A) Helen Keller B) Lady Ada Byron C) Amelia Earhart D) Dayana
- 133) world famous writer of Crime and thriller novels ? (B)
A) Charles Dickens B) Agatha Christie C) Ian Fleming D) Montessori
- 134) who is known as mother of Primary Education ? (D)
A) Queen mary B) Queen Elizebeth C) Queen Victoria D) Lady Montessori
- 135) Who discovered sea route to India ? (B)
A) Leif Ericsson B) Vascodo Gama C) Chirstopher Columbus D) Eric the Red

- 136) First Italian Traveller to reach China ? (A)
A) Marco Polo B) Bartholomeu Dias C) Ibn Battuta D) Amundsen
- 137) ----- is Roof of the world ? (C)
A) Korea B) Japan C) Tibet D) China
- 138) The first person to climb Mount Everest ? (A)
A) Edmund Hillary B) Neil Armstrong C) Piccard D) Mathew fontaine maury
- 139) The First Woman police officer climbed Mount Everest recently ? (B)
A) Kiran bedi B) G.R.Radhika C) Swathi Lakra D) Aruna Bhuguna
- 140) The most abundant Gas in the universe is ? (C)
A) Oxygen B) Nitrogen C) Hydrogen D) Helium
- 141) Which is Known as World Sugar Bowl ? (C)
A)China B) Chile C) Cuba D) Burma
- 142 Which is Known as City of Canals ? (A)
A) Venice B) Austrila C) New York D) Paris
- 143) The Largest Island is ? (A)
A) Green Land B) Ice Land C) Andaman and Nicobar D) Laksha dweep
- 144) The author of "My Experiments with truth" (A)
A) Mohan Das Karamchand Gandhi B) Ravindra Nath Tagore C) Nehru D) Advani
- 145) The slogan "Jai Jawan Jai Kisan" was given by (C)
A) Balgangadhar Sastry B) Bipin Chandra Pal C) Lalbahadur Sastry D) None of the above
- 146) The famous silk centre in Tamilnadu (B)
A) Ooty B) Conjeevaram C) Mahabalipuram D) Chidambaram
- 147) The grand old man of India (B)
A) Sardar Patel B) Dadabai Nauroji C) Subhash Chandra Bose D) Balagangadhar Tilak
- 148) Diesel Engine invented by (A)
A) Rudolph Diesel B) Alexander Fleming C) Right Brothers D) James Guttenburg
- 149) Dynamo invented by (D)
A) Davvison B) London C) Dalton D) Michael Faraday
- 150) Buland Darwaja located at (C)
A) Delhi B) Jhansi C) Fathepur Sikri D) Agra
151. Rajiv Gandhi International Airport situated at (C)
A) Mumbai B) Delhi C) Hyderabad D) Chennai

152. Lalbahadu rSastry Airport is at (A)
A) Varanasi B)Nagpur C) Jaipur D) Ahmedabad
153. Indira Gandhi International Airport is at (D)
A) Lucknow B)Bangalore C) SrinagaR D) Delhi
154. Chatrapati Shivaji International Airport is at (B)
A)Amritsai B) Mumbai C) Kolkata D) Cochin
155. Vir Savarkar Air port is at (A)
A) Port Blair B) Nagpur C) Jaipur D) Amritsar
156. Kempegowda International Airport is at (C)
A)Goa B) cochin C) Bangalore D)Calicut
157. Netaji Subhash Chandra Bose International Airport is at (A)
A) Kolkata B) Ahmedabad C) Varanasi D) Lucknow
158. SardarVallabbai Patel International Airport is at (D)
A) Kolkata B)Guwahati C) Srinagar D) Ahmedabad
159. Sri Gururamdasji International Airport is at (C)
A) Srinagar B) Tiruchunapalli C) Amritsar D) Coimbatore
- 160) Ambedkar Airport is at (A)
A) Nagpur B) Mumbai C) Lucknow D) Ahmedabad