

ELECTRICIAN TRADE 1ST semester

1. The ratio of voltage and electric current in a closed circuit
 - a. remains constant
 - b. varies
 - c. increases
 - d. falls
2. The curve representing ohm's law is
 - a. sine function
 - b. Linear
 - c. a parabola
 - d. a hyperbola
3. The resistance of a conductor having length l area of cross section a and resistivity ρ is given as:
 - a. $\rho a/l$
 - b. $\rho l/a$
 - c. $\rho l a$
 - d. l/ρ
4. The resistance of wire varies inversely as
 - a. area of cross section
 - b. length
 - c. resistivity
 - d. temperature
5. Which of the following quantities are same in all parts of a series circuit?
 - a. voltage
 - b. power
 - c. current
 - d. resistance
6. Which of the following statements is false in case of a series circuit?
 - a. the voltage drop across each resistor is same
 - b. the current flowing through each resistor is the same
 - c. applied voltage is equal to the sum of voltage drops across individual resistorsresistors are additive
7. A resistance of $30\ \Omega$ is connected across 240V supply. If a resistance $R\ \Omega$ is connected in parallel with $30\ \Omega$ resistor across the same supply, the current drawn becomes triple of original one. The unknown resistor R is
 - a. $15\ \Omega$
 - b. $10\ \Omega$
 - c. $5\ \Omega$
 - d. $30\ \Omega$
8. Three resistors, each of R ohms, are connected to form a triangle. The resistance between any two terminals will be:
 - a. $2/3 R$
 - b. $3/2 R$
 - c. R
 - d. $3R$
9. Which of the following is not correct?

- a. $P=V/R^2$ b. $P=VI$ c. $I=\sqrt{(P/R)}$ d. $V=\sqrt{PR}$

10. A 100W bulb is connected in series with a room heater. If now 100W bulb is replaced by a 40w bulb, the heater output will :

- a. increase b. decreases c. remain the same

11. The voltage applied across an electric iron is halved. The power consumption of the iron will be:

- a. one-half b. one-fourth c. $1/\sqrt{2}$ times

12. Resistance of 200w, 250v lamp will be

- a. 625 Ω b. 1250 Ω c. 312.5 Ω d. 31.25 Ω

13. Two heaters rated at 1000w, 250v each are connected in series across a 250v, 50Hz ac supply. The total power drawn from the supply will be:

- a. 1000w b. 500w c. 250w d. 2000w

14. A 200w, 100v lamp is to be operated on 250v supply. The additional resistance required to be connected in series will be:

- a. 125 Ω b. 50 Ω c. 75 Ω d. 25 Ω

15. Kirchoff's laws are valid for

- a. linear ckt only b. passive time invariant ckt
c. non-linear ckt only d. both linear & non-linear ckt

16. KCL is applicable only to

- a. electric circuits b. electronic circuits
c. junctions in a network d. closed loop in a network

17. KVL is concerned with

- a. IR drop b. battery emf c. junction node d. both a and b

18. A wye arrangement of resistances has each resistance of 3 Ω , the equivalent delta arrangement will have each resistance of values.

- a. 9 Ω b. 6 Ω c. 3 Ω d. 1 Ω

19. A battery is connected to a resistance causing a current of 0.5A in the circuit. The current drops to 0.4 when an additional resistance of 5Ω is connected in series. The current will drop to 0.2A when the resistance is further increased by

- a. 10Ω b. 15Ω c. 25Ω d.

20. Cells are connected in series in order to increase the

- a. current capacity b. life of the cells c. voltage rating
d. terminal voltage

21. Cells are connected in parallel in order to increase

- a. life of the cells b. efficiency c. current capacity d. voltage rating

22. When two cells are connected in parallel, it should ensure that have

- a. identical internal resistances b. equal emfs c. same ampere hour capacity

23. The capacity of a battery is expressed in

- a. amperes b. amperes-hour c. watts d. watt-hour

24. A series resonant circuit implies

- a. zero pf and maximum current b. unity pf and maximum current
c. unity pf and minimum current d. zero pf and minimum current

25. which one is classified as integrating instrument?

- a. D'Arsonval galvanometer b. ampere-hour meter c. ohm-meter d. ammeter

26. Which of the following types of instrument is an integrating instrument?

- a. power factor meter b. energy meter c. watt meter d. frequency meter

27. Voltmeter should be of very high resistance so that

- a. its range is high b. Its accuracy is high
c. it may draw current minimum possible d. its sensitivity is high

28. If a voltmeter is connected like an ammeter in series with a load

- a. the measurement reading will be too high b. Almost no current will flow in the circuit
c. the meter will burn out d. an inadmissably high current will flow

29. A multirange instrument (ammeter or voltmeter) has

- a. Multiple shunt or series resistances inside the meter b. variable coil turns
c. multi -coil arrangement d. any of the above

30. The S.I. unit of power is

- a. henry b. coulomb c. watt d. watt-hour

31. Electric pressure is also called

- a. resistance b. power c. voltage d. energy

32 The substances whch have a large number of free electrons and offer a low resistance are called

- a. insulators b. inductors c. semi-conductors d. conductors

33. Out of the following which is not a poor conductor ?

- a. Cast iron b. Copper c. Carbon d. Tungsten

34. Out of the following which is an insulating material ?

- a. Copper b. Gold c. Silver d. Paper

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

- a. resistance b. reluctance c. conductance d. inductance

36 . Conductance is reciprocal of

- (a) resistance (b) inductance (c) reluctance (d) capacitance

37. The resistance of a conductor varies inversely as

- (a) length (b) area of cross-section (c) temperature (d) resistivity

38. With rise in temperature the resistance of pure metals

- (a) Increases (b) decreases
(c) first increases and then decreases (d) remains constant

39. With rise in temperature the resistance of semi-conductors

- (a) decreases (b) increases
(c) first increases and then decreases (d) remains constant

40. The resistance of a copper wire 200 m long is 21 Q. If its thickness (diameter) is 0.44 mm, its specific resistance is around

- (a) 1.2×10^{-8} Q-m (b) 1.4×10^{-8} Q-m
(c) 1.6×10^{-8} Q-m (d) 1.8×10^{-8} Q-m

41. Three resistances of 10 ohms, 15 ohms and 30 ohms are connected in parallel.

The total resistance of the combination is

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

42. An instrument which detects electric current is known as

- (a) voltmeter (b) rheostat (c) wattmeter (d) galvanometer

43. In a circuit a 33 Q resistor carries a current of 2 A. The voltage across the resistor is

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

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

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

45. 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 ?

- (a) 18 Q (b) 36 Q (c) 48 Q (d) 64 Q

46. Four wires of same material, the same cross-sectional area and the same length when connected in parallel give a resistance of 0.25 Q. If the same four wires are connected in series the effective resistance will be

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

47. A current of 16 amperes divides between two branches in parallel of resistances 8 ohms and 12 ohms respectively. The current in each branch is

- (a) 6.4 A, 6.9 A (b) 6.4 A, 9.6 A (c) 4.6 A, 6.9 A (d) 4.6 A, 9.6 A

48. Current velocity through a copper conductor is

- (a) the same as propagation velocity of electric energy (b) independent of current strength
(c) of the order of a few m/s (d) nearly $3 \times 10^8 \text{ m/s}$

49. Which of the following material has nearly zero temperature co-efficient of resistance?

- (a) Manganin (b) Porcelain (c) Carbon (d) Copper

50. You have to replace 1500 Q resistor in radio. You have no 1500 Q resistor but have several 1000 Q ones which you would connect

- (a) two in parallel (b) two in parallel and one in series (c) three in parallel (d) three in series

51. Two resistors are said to be connected in series when

- (a) same current passes in turn through both (b) both carry the same value of current
(c) total current equals the sum of branch currents (d) sum of IR drops equals the applied e.m.f.

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

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

53. Which of the following materials has a negative temperature co-efficient of resistance?

- (a) Copper (b) Aluminum (c) Carbon (d) Brass

54. Ohm's law is not applicable to

- (a) vacuum tubes (b) carbon resistors
(c) high voltage circuits (d) circuits with low current densities

55. Which is the best conductor of electricity ?

- (a) Iron (b) Silver (c) Copper (d) Carbon

56. For which of the following 'ampere second' could be the unit ?

- (a) Reluctance (b) Charge (c) Power (d) Energy

57. All of the following are equivalent to watt except

- (a) (amperes) ohm (b) joules/sec. (c) amperes x volts (d) amperes/volt

58. A resistance having rating 10 ohms, 10W is likely to be a

- (a) metallic resistor
(b) carbon resistor
(c) wire wound resistor
(d) variable resistor

59. Which one of the following does not have negative temperature co-efficient ?

- (a) Aluminium
(b) Paper
(c) Rubber
(d) Mica

60. Varistors are

- (a) insulators
(b) non-linear resistors

- (c) carbon resistors
 - (d) resistors with zero temperature coefficient
61. Insulating materials have the function of
- (a) preventing a short circuit between conducting wires
 - (b) preventing an open circuit between the voltage source and the load
 - (c) conducting very large currents
 - (d) storing very high currents
62. The rating of a fuse wire is always expressed in
- (a) ampere-hours
 - (b) ampere-volts
 - (c) kWh
 - (d) amperes
63. The minimum charge on an ion is
- (a) equal to the atomic number of the atom
 - (b) equal to the charge of an electron
 - (c) equal to the charge of the number of electrons in an atom (#) zero
64. In a series circuit with unequal resistances
- (a) the highest resistance has the most of the current through it
 - (b) the lowest resistance has the highest voltage drop
 - (c) the lowest resistance has the highest current
 - (d) the highest resistance has the highest voltage drop
65. The filament of an electric bulb is made of
- (a) carbon
 - (b) aluminium
 - (c) tungsten
 - (d) nickel
66. A 3 Ω resistor having 2 A current will dissipate the power of
- (a) 2 watts
 - (b) 4 watts
 - (c) 6 watts
 - (d) 8 watts
67. Which of the following statement is true?
- (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
68. The resistance of a few metres of wire conductor in closed electrical circuit is
- (a) practically zero
 - (b) low
 - (c) high
 - (d) very high
69. If a parallel circuit is opened in the main line, the current
- (a) increases in the branch of the lowest resistance
 - (b) increases in each branch
 - (c) is zero in all branches
 - (d) is zero in the highest resistive branch
70. If a wire conductor of 0.2 Ω resistance is doubled in length, its resistance becomes
- (a) 0.4 Ω
 - (b) 0.6 Ω
 - (c) 0.8 Ω
 - (d) 1.0 Ω
71. Three 60 W bulbs are in parallel across the 60 V power line. If one bulb burns open
- (a) there will be heavy current in the main line

- (b) rest of the two bulbs will not light
- (c) all three bulbs will light
- (d) the other two bulbs will light

72. The four bulbs of 40 W each are connected in series with a battery across them, which of the following statement is true ?

- (a) The current through each bulb is same
- (b) The voltage across each bulb is not same
- (c) The power dissipation in each bulb is not same
- (d) None of the above

73. Two resistances R_1 and R_2 are connected in series across the voltage source where $R_2 > R_1$. The largest drop will be across

- (a) R_2
- (b) R_1
- (c) either R_1 or R_2
- (d) none of them

74. What will be energy used by the battery if the battery has to drive 6.28×10^{18} electrons with potential difference of 20 V across the terminal ?

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

75. A closed switch has a resistance of

- (a) zero
- (b) about 50 ohms
- (c) about 500 ohms
- (d) infinity

76. The hot resistance of the bulb's filament is higher than its cold resistance because the temperature co-efficient of the filament is

- (a) zero
- (b) negative
- (c) positive
- (d) about 2 ohms per degree

77. Heat in a conductor is produced on the passage of electric current due to

- (a) reactance
- (b) capacitance
- (c) impedance
- (d) resistance

78. The insulation on a current carrying conductor is provided

- (a) to prevent leakage of current
- (b) to prevent shock
- (c) both of above factor
- (d) none of above factors

79. The thickness of insulation provided on the conductor depends on

- (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

80. Which of the following quantities remain the same in all parts of a series circuit ?

- (a) Voltage

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

81. A 40 W bulb is connected in series with a room heater. If now 40 W bulb is replaced by 100 W bulb, the heater output will

- (a) decrease
- (b) increase
- (c) remain same
- (d) heater will burn out

82. In an electric kettle water boils in 10 minutes. It is required to boil the boiler in 15 minutes, using same supply mains

- (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 if water
- (d) none of the above

83. An electric filament bulb can be worked from

- (a) D.C. supply only
- (b) A.C. supply only
- (c) Battery supply only
- (d) All above

84. Resistance of a tungsten as applied voltage increases

- (a) decreases
- (b) increases
- (c) remains same
- (d) none of the above

85. Electric current passing through the circuit produces

- (a) magnetic effect
- (b) luminous effect
- (c) thermal effect
- (d) chemical effect
- (e) all above effects

86. Resistance of a material always decreases if

- (a) temperature of material is decreased
- (b) temperature of material is increased
- (c) number of free electrons available become more
- (d) none of the above is correct

Ans: c

87. If the efficiency of a machine is to be high, what should be low ?

- (a) Input power
- (b) Losses
- (c) True component of power
- (d) kWh consumed
- (e) Ratio of output to input

Ans: b

88. When electric current passes through a metallic conductor, its temperature rises. This is due to

- (a) collisions between conduction electrons and atoms
- (b) the release of conduction electrons from parent atoms
- (c) mutual collisions between metal atoms
- (d) mutual collisions between conducting electrons

Ans: a

89. Two bulbs of 500 W and 200 W rated at 250 V will have resistance ratio as

- (a) 4 : 25
- (b) 25 : 4
- (c) 2 : 5
- (d) 5 : 2

Ans: c

90. A glass rod when rubbed with silk cloth is charged because

- (a) it takes in proton
- (b) its atoms are removed
- (c) it gives away electrons
- (d) it gives away positive charge

Ans: c

91. Whether circuit may be AC. or D.C. one, following is most effective in reducing the magnitude of the current.

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

Ans: d

92. It becomes more difficult to remove

- (a) any electron from the
- (b) first electron from the orbit
- (c) second electron from the orbit
- (d) third electron from the orbit

Ans: d

93. When one leg of parallel circuit is opened out the total current will

- (a) reduce
- (b) increase
- (c) decrease
- (d) become zero

Ans: c

94. In a lamp load when more than one lamp are switched on the total resistance of the load

- (a) increases
- (b) decreases
- (c) remains same
- (d) none of the above

Ans: b

95. Two lamps 100 W and 40 W are connected in series across 230 V (alternating).

Which of the following statement is correct ?

- (a) 100 W lamp will brighter
- (b) 40 W lamp will glow brighter
- (c) Both lamps will glow equally bright
- (d) 40 W lamp will fuse

Ans: b

96. Resistance of 220 V, 100 W lamp will be

- (a) 4.84 Q
- (b) 48.4 Q
- (c) 484 ft
- (d) 4840 Q

Ans: c

97. In the case of direct current

- (a) magnitude and direction of current remains constant
- (b) magnitude and direction of current changes with time
- (c) magnitude of current changes with time
- (d) magnitude of current remains constant

Ans: a

98. When electric current passes through a bucket full of water, lot of bubbling is observed. This suggests that the type of supply is

- (a) A.C.
- (b) D.C.
- (c) any of above two
- (d) none of the above

Ans: b

99. Resistance of carbon filament lamp as the applied voltage increases.

- (a) increases
- (b) decreases
- (c) remains same
- (d) none of the above

Ans: b

100. Bulbs in street lighting are all connected in

- (a) parallel
- (b) series
- (c) series-parallel
- (d) end-to-end

Ans: a

101. For testing appliances, the wattage of test lamp should be

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

Ans: c

102. Switching of a lamp in house produces noise in the radio. This is because switching operation produces

- (a) arcs across separating contacts
- (b) mechanical noise of high intensity
- (c) both mechanical noise and arc between contacts
- (d) none of the above

Ans: a

103. Sparking occurs when a load is switched off because the circuit has high

- (a) resistance
- (b) inductance
- (c) capacitance
- (d) impedance

Ans: b

104. Copper wire of certain length and resistance is drawn out to three times its length without change in volume, the new resistance of wire becomes

- (a) 1/9 times
- (b) 3 times
- (c) 9 times
- (d) unchanged

Ans: c

105. When resistance element of a heater fuses and then we reconnect it after removing a portion of it, the power of the heater will

- (a) decrease
- (b) increase

- (c) remain constant
- (d) none of the above

Ans: b

106. A field of force can exist only between

- (a) two molecules
- (b) two ions
- (c) two atoms
- (d) two metal particles

Ans: b

107. A substance whose molecules consist of dissimilar atoms is called

- (a) semi-conductor
- (b) super-conductor
- (c) compound
- (d) insulator

Ans: c

108. International ohm is defined in terms of the resistance of

- (a) a column of mercury
- (b) a cube of carbon
- (c) a cube of copper
- (d) the unit length of wire

Ans: a

109. Three identical resistors are first connected in parallel and then in series.

The resultant resistance of the first combination to the second will be

- (a) 9 times
- (b) $1/9$ times
- (c) $1/3$ times
- (d) 3 times

Ans: b

110. Which method can be used for absolute measurement of resistances ?

- (a) Lorentz method
- (b) Releigh method
- (c) Ohm's law method
- (d) Wheatstone bridge method

Ans: d

111. 3 6 ohm resistors are connected to form a triangle. What is the resistance between any two corners ?

- (a) $3/2$ Q
- (b) 6 Q
- (c) 4 Q
- (d) $8/3$ Q

Ans: c

112. Ohm's law is not applicable to

- (a) semi-conductors
- (b) D.C. circuits
- (c) small resistors
- (d) high currents

Ans: a

113. Two copper conductors have equal length. The cross-sectional area of one conductor is four times that of the other. If the conductor having smaller cross-sectional area has a resistance of 40 ohms the resistance of other conductor will be

- (a) 160 ohms
- (b) 80 ohms
- (c) 20 ohms

(d) 10 ohms

Ans: d

114. A nichrome wire used as a heater coil has the resistance of $2 \text{ } \Omega/\text{m}$. For a heater of 1 kW at 200 V, the length of wire required will be

(a) 80 m

(b) 60 m

(c) 40 m

(d) 20 m

Ans: a

115. Temperature co-efficient of resistance is expressed in terms of

(a) ohms/ $^{\circ}\text{C}$

(b) mhos/ohm $^{\circ}\text{C}$

(c) ohms/ohm $^{\circ}\text{C}$

(d) mhos/ $^{\circ}\text{C}$

Ans: c

116. Which of the following materials has the least resistivity ?

(a) Zinc

(b) Lead

(c) Mercury

(d) Copper

Ans:

117. When current flows through heater coil it glows but supply wiring does not glow because

(a) current through supply line flows at slower speed

(b) supply wiring is covered with insulation layer

(c) resistance of heater coil is more than the supply wires

(d) supply wires are made of superior material

Ans: c

118. The condition for the validity under Ohm's law is that

(a) resistance must be uniform

(b) current should be proportional to the size of the resistance

(c) resistance must be wire wound type

(d) temperature at positive end should be more than the temperature at negative end

Ans: a

119. Which of the following statement is correct ?

(a) A semi-conductor is a material whose conductivity is same as between that of a conductor and an insulator

(b) A semi-conductor is a material which has conductivity having average value of conductivity of metal and insulator

(c) A semi-conductor is one which conducts only half of the applied voltage

(d) A semi-conductor is a material made of alternate layers of conducting material and insulator

Ans: a

120. A rheostat differs from potentiometer in the respect that it

(a) has lower wattage rating

(b) has higher wattage rating

(c) has large number of turns

(d) offers large number of tappings

Ans: b

121. The weight of an aluminium conductor as compared to a copper conductor of identical cross-

section, for the same electrical resistance, is

- (a) 50%
- (b) 60%
- (c) 100%
- (d) 150%

Ans: a

122. An open resistor, when checked with an ohm-meter reads

- (a) zero
- (b) infinite
- (c) high but within tolerance
- (d) low but not zero

Ans: b

123. are the materials having electrical conductivity much less than most of the metals but much greater than that of typical insulators.

- (a) Varistors
- (b) Thermistor
- (c) Semi-conductors
- (d) Variable resistors

Ans: c

124. All good conductors have high

- (a) conductance
- (b) resistance
- (c) reluctance
- (d) thermal conductivity

Ans: a

125. Voltage dependent resistors are usually made from

- (a) charcoal
- (b)
- (c) nichrome
- (d) graphite

Ans: c

126. Voltage dependent resistors are used

- (a) for inductive circuits
- (b) to suppress surges
- (c) as heating elements
- (d) as current stabilizers

Ans: b

127. The ratio of mass of proton to that of electron is nearly

- (a) 1840
- (b) 1840
- (c) 30
- (d) 4

Ans: a

128. The number of electrons in the outer most orbit of carbon atom is

- (a) 3
- (b) 4
- (c) 6
- (d) 7

Ans: b

129. With three resistances connected in parallel, if each dissipates 20 W the total power supplied by the voltage source equals

- (a) 10 W
- (b) 20 W
- (c) 40 W
- (d) 60 W

Ans: d

130. A thermistor has

- (a) positive temperature coefficient
- (b) negative temperature coefficient
- (c) zero temperature coefficient
- (d) variable temperature coefficient

Ans: c

131. 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) I^2Rt
- (b) I^2Rf
- (c) I^2R^2t
- (d) $I^2R^2t^*$

Ans: a

132. Nichrome wire is an alloy of

- (a) lead and zinc
- (b) chromium and vanadium
- (c) nickel and chromium
- (d) copper and silver

Ans: c

133. When a voltage of one volt is applied, a circuit allows one microampere current to flow through it. The conductance of the circuit is

- (a) 1 n-mho
- (b) 106 mho
- (c) 1 milli-mho
- (d) none of the above

Ans: a

134. Which of the following can have negative temperature coefficient ?

- (a) Compounds of silver
- (b) Liquid metals
- (c) Metallic alloys
- (d) Electrolytes

Ans: d

135. Conductance : mho ::

- (a) resistance : ohm
- (b) capacitance : henry
- (c) inductance : farad
- (d) lumen : steradian

Ans: a

136. 1 angstrom is equal to

- (a) 10^{-8} mm
- (b) 10^{-6} cm
- (c) 10^{-10} m

(d) 10^{-14} m

Ans: c

137. One newton metre is same as

(a) one watt

(b) one joule

(c) five joules

(d) one joule second

Ans: b

138. The force between two charges is 120 N. If the distance between the charges is doubled, the force will be

(a) 60 N

(b) 30 N

(c) 40 N

(d) 15 N

Ans: b

139. The electric field intensity at a point situated 4 metres from a point charge is 200 N/C. If the distance is reduced to 2 metres, the field intensity will be

(a) 400 N/C

(b) 600 N/C

(c) 800 N/C

(d) 1200 N/C

Ans: c

140. The lines of force due to charged particles are

(a) always straight (b) always curved

(c) sometimes curved (d) none of the above

Ans: b

141. The electric field at a point situated at a distance d from straight charged conductor is

(a) proportional to d

(b) inversely proportional to d

(c) inversely proportional to d

(d) none of the above

Ans: b

142. The direction of electric field due to positive charge is .

(a) away from the charge (b) towards the charge

(c) both (a) and (b) (d) none of the above

Ans: a

143. A field line and an equipotential surface are

(a) always parallel (b) always at 90°

(c) inclined at any angle (d) none of the above

Ans: b

144. The ability of charged bodies to exert force on one another is attributed to the existence of

(a) electrons

(b) protons

(c) neutrons

(d) electric field

Ans: d

145. If the sheet of a bakelite is inserted between the _____ of an _____, the capacitance will

- (a) decrease
- (b) increase
- (c) remains unchanged
- (d) become zero

Ans: b

146. A capacitor stores 0.24 coulombs at 10 volts. Its capacitance is

- (a) 0.024 F
- (b) 0.12 F
- (c) 0.6 F
- (d) 0.8 F

Ans: a

147. For making a capacitor, it is better to select a dielectric having

- (a) low permittivity
- (b) high permittivity
- (c) permittivity same as that of air
- (d) permittivity slightly more than that of air

Ans: b

148. The units of capacitance are

- (a) volts/coulomb
- (b) coulombs/volt
- (c) ohms
- (d) henry/Wb

Ans: b

149. If three 15 μF capacitors are connected in series, the net capacitance is

- (a) 5 μF
- (b) 30 μF
- (c) 45 μF
- (d) 50 μF

Ans: a

150. If three 10 μF capacitors are connected in parallel, the net capacitance is

- (a) 20 μF
- (b) 30 μF
- (c) 40 μF
- (d) 50 μF

Ans: b

151. A dielectric material must be

- (a) resistor
- (b) insulator
- (c) good conductor
- (d) semi conductor

Ans: b

152. An electrolytic capacitor can be used for

- (a) D.C. only
- (b) AC. only
- (c) both D.C. as well as A.C.

Ans: a

153. The capacitance of a capacitor is not affected by

- (a) distance between plates
- (b) area of plates
- (c) thickness of plates
- (d) all of the above

Ans: c

154. Which of the following is not a vector ?

- (a) Linear momentum
- (b) Angular momentum
- (c) Electric field
- (d) Electric potential

Ans: b

155. Two plates of a parallel capacitor after being charged from a constant voltage source are separated apart by means of insulated handles, then the

- (a) Voltage across the plates
- (b) voltage across the plates decreases
- (c) charge on the capacitor decreases
- (d) charge on the capacitor increases

Ans: b

156. If A.C. voltage is applied to capacitive circuit, the alternating current can flow in the circuit because

- (a) varying voltage produces the charging and discharging currents
- (b) of high peak value
- (c) charging current can flow
- (d) discharge current can flow

Ans: a

157. Voltage applied across a ceramic dielectric produces an electric field 100 times greater than air. What will be the value of dielectric constant ?

- (a) 50
- (b) 100
- (c) 150
- (d) 200

Ans: b

158. Which of the following statements is correct ?

- (a) Air capacitors have a blackband to indicate the outside foil
- (b) Electrolytic capacitor must be connected in the correct polarity
- (c) Ceramic capacitors must be connected in the correct polarity
- (d) Mica capacitors are available in capacitance value of 1 to 10 pF

Ans: b

159. The dissipation factor of a good dielectric is of the order of

- (a) 0.0002
- (b) 0.002

- (c) 0.02
- (d) 0.2

Ans: a

160. "The total electric flux through any closed surface surrounding charges is equal to the amount of charge enclosed".

The above statement is associated with

- (a) Coulomb's square law
- (b) Gauss's law
- (c) Maxwell's first law
- (d) Maxwell's second law

Ans: b

161. Three capacitors each of the capacity C are given. The resultant capacity $\frac{2}{3} C$ can be obtained by using them

- (a) all in series
- (b) all in parallel
- (c) two in parallel and third in series with this combination
- (d) two in series and third in parallel across this combination

Ans: c

162. For which of the following parameter variation, the capacitance of the capacitor remains unaffected ?

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

Ans: d

163. Which of the following statement is true ?

- (a) The current in the discharging capacitor grows linearly
- (b) The current in the discharging capacitor grows exponentially
- (c) The current in the discharging capacitor decays exponentially
- (d) The current in the discharging capacitor decreases constantly

Ans: b

164. Which of the following expression is correct for electric field strength ?

- (a) $E = D/\epsilon$
- (b) $E = D^2/t$
- (c) $E = j t D$
- (d) $E = n D^2$

Ans: a

165. In a capacitor the electric charge is stored in

- (a) metal plates
- (b) dielectric
- (c) both (a) and (b)
- (d) none of the above

Ans: b

166. Which of the following materials has the highest value of dielectric constant?

- (a) Glass
- (b) Vacuum

- (c) Ceramics
- (d) Oil

Ans: c

167. Which of the following capacitors will have the least variation ?

- (a) Paper capacitor
- (b) Ceramic capacitor
- (c) Silver plated mica capacitor
- (d) None of the above

Ans: c

168. Which of the following statements is incorrect ?

- (a) The leakage resistance of ceramic capacitors is generally high
- (b) The stored energy in a capacitor decreases with reduction in value of capacitance
- (c) The stored energy in a capacitor increases with applied voltage
- (d) A wire cable has distributed capacitance between the conductors

Ans: b

169. Which of the following capacitors has relatively shorter shelf life ?

- (a) Mica capacitor
- (b) Electrolytic capacitor
- (c) Ceramic capacitor
- (d) Paper capacitor

Ans: b

170. The sparking between two electrical contacts can be reduced by inserting a

- (a) capacitor in parallel with contacts
- (b) capacitor in series with each contact
- (c) resistance in line
- (d) none of the above

Ans: a

171. In the case of a lossy capacitor, its series equivalent resistance value will be

- (a) small
- (b) very small
- (c) large
- (d) zero

Ans: c

172. The power dissipated in a pure capacitor is

- (a) zero
- (b) proportional to applied voltage
- (c) proportional to value of capacitance
- (d) both (b) and (c) above

Ans: a

173. In a capacitive circuit

- (a) a steady value of applied voltage causes discharge
- (b) an increase in applied voltage makes a capacitor charge
- (c) decrease in applied voltage makes a capacitor charge
- (d) none of the above

Ans: b

174. When a dielectric slab is introduced in a parallel plate capacitor, the potential difference

between plates will

- (a) remain uncharged
- (b) decrease
- (c) increase
- (d) become zero

Ans: b

175. Capacitance increases with

- (a) increase in plate area and decrease in distance between the plates
- (b) increase in plate area and distance between the plates
- (c) decrease in plate area and value of applied voltage
- (d) reduction in plate area and distance between the plates

Ans: a

176. A capacitor consists of

- (a) two insulators separated by a conductor
- (b) two conductors separated by an insulator
- (c) two insulators only
- (d) two conductors only

Ans: b

177. A paper capacitor is usually available in the form of

- (a) tubes
- (b) rolled foil
- (c) disc
- (d) meshed plates

Ans: b

178. Air capacitors are generally available in the range

- (a) 10 to 400 pF
- (b) 1 to 20 pF
- (c) 100 to 900 pF
- (d) 20 to 100 pF

Ans: a

179. The unit of capacitance is

- (a) henry
- (b) ohm
- (c) farad
- (d) farad/m

Ans: c

180. A capacitor charged to 200 V has 2000 μC of charge. The value of capacitance will be

- (a) 10 F
- (b) 10 μF
- (c) 100 nF
- (d) 1000 μF

Ans: b

181. A capacitor in a circuit became hot and ultimately exploded due to wrong connections, which type of capacitor it could be ?

- (a) Paper capacitor

- (b) Ceramic capacitor
- (c) Electrolytic capacitor
- (d) Any-of the above

Ans: c

182. 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) CV^2
- (b) C^2V
- (c) CV^2
- (d) CV

Ans: a

183. The absolute permittivity of free space is given by

- (a) $8.854 \times 10^{-12} \text{ F/m}$
- (b) $8.854 \times 10^{-10} \text{ F/m}$
- (c) $8.854 \times 10^{-11} \text{ F/m}$
- (d) $8.854 \times 10^{-12} \text{ F/m}$

Ans: b

184. The relative permittivity of free space is given by

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

Ans: a

185. Electric field intensity is a quantity

- (a) scalar
- (b) vector
- (c) both (a) and (b)
- (d) none of the above

Ans: b

186. When 4 volts e.m.f. is applied across a 1 farad capacitor, it will store energy of

- (a) 2 joules
- (b) 4 joules
- (c) 6 joules
- (d) 8 joules

Ans: d

187. The capacitor preferred for high frequency circuits is

- (a) air capacitor
- (b) mica capacitor
- (c) electrolytic capacitor
- (d) none of the above

Ans: b

188. The capacity of capacitor bank used in power factor correction is expressed in terms of

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

Ans: c

189. While testing a capacitor with ohm-metre, if the capacitor shows charging, but the final resistance reading is appreciably less than normal, it can be concluded that the capacitor is

- (a) short-circuited
- (b) open circuited
- (c) alright
- (d) leaky

Ans: d

190. If a 6 μF capacitor is charged to 200 V, the charge in coulombs will be

- (a) 800 μC
- (b) 900 μC
- (c) 1200 μC
- (d) 1600 μC

Ans: c

191. Which capacitor will be physically smaller for the same ratings ?

- (a) Ceramic capacitor
- (b) Paper capacitor
- (c) Both will be of equal size
- (d) None of the above

Ans: a

192. What is the value of capacitance that must be connected in parallel with 50 pF condenser to make an equivalent capacitance of 150 pF ?

- (a) 50 pF
- (b) 100 pF
- (c) 150 pF
- (d) 200 pF

Ans: b

193. A mica capacitor and a ceramic capacitor both have the same physical dimensions. Which will have more value of capacitance ?

- (a) Ceramic capacitor
- (b) Mica capacitor
- (c) Both will have identical value of capacitance
- (d) It depends on applied voltage

Ans: a

194. Which of the following material has least value of dielectric constant ?

- (a) Ceramics
- (b) Oil
- (c) Glass
- (d) Paper

Ans: b

195. Which of the following capacitors will have the least value of breakdown voltage ?

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

Ans: d

196. The breakdown voltage for paper capacitors is usually

- (a) 20 to 60 volts
- (b) 200 to 1600 volts
- (c) 2000 to 3000 volts
- (d) more than 10000 volts

Ans:

197. Dielectric constant for mica is nearly

- (a) 200
- (b) 100
- (c) 3 to 8
- (d) 1 to 2

Ans: c

198. The value of dielectric constant for vacuum is taken as

- (a) zero
- (b) 1
- (c) 4
- (d) 10

Ans: b

199. Which of the following capacitors is marked for polarity ?

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

Ans: d

200. Which of the following capacitors can be used for temperature compensation ?

- (a) Air capacitor
- (b) Ceramic capacitor
- (c) Paper capacitor
- (d) None of the above

Ans: b

201. Which of the following statements is incorrect ?

- (a) The thinner the dielectric, the more the capacitance and the lower the voltage breakdown rating for a capacitor .
- (b) A six dot mica capacitor colour coded white, green, black, red and yellow has the capacitance value of 500 pF
- (c) Capacitors in series provide less capacitance but a higher voltage breakdown rating for the combination
- (d) A capacitor can store charge because it has a dielectric between two conductors

Ans: b

202. Paper capacitors usually have a tolerance of

- (a) $\pm 5\%$
- (b) $\pm 10\%$
- (c) $\pm 15\%$
- (d) $\pm 20\%$

Ans: b

203. For closer tolerances which of the following capacitors is usually preferred ?

- (a) Paper capacitor
- (b) Mica capacitor
- (c) Ceramic disc capacitor
- (d) None of the above

Ans: b

204. The electrostatic force between two charges of one coulomb each and placed at a distance of 0.5 m will be

- (a) 36×10^6 N
- (b) 36×10^7 N
- (c) 36×10^8 N
- (d) 36×10^9 N

Ans: d

205. The units of volume charge density are

- (a) Coulomb/metre
- (b) Coulomb/metre
- (c) Coulomb/metre
- (d) Coulomb/metre

Ans: c

206. "The surface integral of the normal component of the electric displacement D over any closed surface equals the charge enclosed by the surface".

The above statement is associated with

- (a) Gauss's law
- (b) Kirchhoff's law
- (c) 's law
- (d) Lenz's law

Ans: a

207. Dielectric strength of mica is

- (a) 10 to 20 kV/mm
- (b) 30 to 50 kV/mm
- (c) 50 to 200 kV/mm
- (d) 300 to 500 kV/mm

Ans: c

208. The dielectric constant (relative permittivity) of glass is given by

- (a) 0.1 to 0.4
- (b) 0.5 to 1.0
- (c) 2.0 to 4.0
- (d) 5 to 100

Ans: d

209. capacitors are mainly used for radio frequency tuning.

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

Ans: b

210. capacitors can be used only for D.C.

- (a) Air
- (b) Paper

- (e) Mica
- (d) Electrolytic

Ans: d

211. capacitors are used in transistor circuits.

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

Ans: a

212. capacitors are used for audio frequency and radio frequency coupling and tuning.

- (a) Air
- (b) Mica
- (c) Plastic film
- (d) Ceramic

Ans: b

213. The inverse of capacitance is called

- (a) reluctance
- (b) conductance
- (c) susceptance
- (d) elastance

Ans: d

214. When the dielectric is homogeneous, the potential gradient is

- (a) uniform
- (b) non-uniform
- (c) zero
- (d) any of the above

Ans: a

215. The potential gradient across the material of low permittivity is than across the material of high permittivity.

- (a) smaller
- (b) greater
- (c) both (a) and (b)
- (d) none of the above

Ans: b

216. _____ field is associated with the capacitor.

- (a) Electric
- (b) Magnetic
- (c) Both (a) and (b)
- (d) None of the above

Ans: a

217. A capacitor having capacitance of 5 μF is charged to a potential difference of 10,000 V. The energy stored in the capacitor is

- (a) 50 joules
- (b) 150 joules
- (c) 200 joules

(d) 250 joules

Ans: d

218. A single core cable used on 33000 V has conductor diameter 10 mm and the internal diameter of sheath 25 mm. The maximum electrostatic stress in the cable is

(a) 62×10^5 V/m

(b) 72×10^5 V/m

(c) 82×10^5 V/m

(d) 92×10^5 V/m

Ans: b

219. Two infinite parallel plates 10 mm apart have maintained between them a potential difference of 100 V. The acceleration of an electron placed between them is

(a) 0.56×10^{15} m/s²

(b) 1.5×10^{15} m/s²

(c) 1.6×10^{15} m/s²

(d) 1.76×10^{15} m/s²

Ans: d

220. The total deficiency or excess of electrons in a body is known as

(a) current

(b) voltage

(c) potential gradient

(d) charge

Ans: d

221. The relative permittivity has the following units

(a) F/m

(b) m/F

(c) Wb/m

(d) no units

Ans: c

222. The phenomenon of an uncharged body getting charged merely by the nearness of a charged body is known as

(a) photoelectric effect

(b) chemical effect

(c) magnetic effect

(d) induction

Ans: d

223. A unit tube of flux is known as tube

(a) Newton

(b) Faraday

(c) Michale

(d) None of the above

Ans: b

224. The number of Faraday tubes of flux passing through a surface in an electric field is called

(a) electric flux

(b) electric flux density

(c) magnetic flux density

(d) electric charge density

Ans: a

225. The unit of electric intensity is

- (a) N/C^2
- (b) Wb/m^2
- (c) N/C
- (d) N^2/C

Ans:

226. The value of E within the field due to a point charge can be found with the help of

- (a) Faraday's laws
- (b) Kirchhoff's laws
- (c) Coulomb's laws
- (d) none of the above

Ans: c

227. ϵ at a point may be defined as equal to the lines of force passing normally through a unit cross section at that point.

- (a) Electric intensity
- (b) Magnetic flux density
- (c) Electric flux
- (d) None of the above

Ans: a

228. Electric intensity at any point in an electric field is equal to the ϵ at that point.

- (a) electric flux
- (b) magnetic flux density
- (c) potential gradient
- (d) none of the above

Ans: c

229. Electric displacement is a _____ quantity.

- (a) scalar
- (b) vector
- (c) both of the above
- (d) none of the above

Ans: b

230. ϵ at a point is equal to the negative potential gradient at that point.

- (a) Electric intensity
- (b) Electric flux
- (c) Magnetic flux
- (d) Magnetic flux density

Ans: a

231. The unit of dielectric strength is given by

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

Ans: a

232. Dielectric strength _____ with increasing thickness

- (a) increases

- (b) decreases
- (c) remains unaltered
- (d) none of the above

Ans: b

233. The property of a capacitor to store electricity is called its

- (a) capacitance
- (b) charge
- (c) energy
- (d) none of the above

Ans: a

234. _____ is that property of a capacitor which delays any change of voltage across it.

- (a) Inductance
- (b) Capacitance
- (c) Potential gradient
- (d) None of the above

Ans: b

235. A capacitance of 100 μF is connected in series with a resistance of 8000 Ω . The time constant of the circuit is

- (a) 0.2 s
- (b) 0.4 s
- (c) 0.6 s
- (d) 0.8 s

Ans: d

236. In a cable capacitor, voltage gradient is maximum at the surface of the

- (a) earth
- (b) conduction
- (c) sheath
- (d) insulator

Ans: b

237. The time constant of an R-C circuit is defined as the time during which capacitor charging voltage actually rises to _____ percent of its _____ value.

- (a) 37, initial
- (b) 63.2, initial
- (c) 63.2, final
- (d) 37, final

Ans: c

238. The time constant of an R-C circuit may also be defined as the time during which the charging current falls to _____ percent of its initial maximum value,

- (a) 37
- (b) 42
- (c) 63
- (d) 73

Ans: a

239. The capacitance of a capacitor is influenced by

- (a) plate area
- (b) plate separation

- (c) nature of dielectric
- (d) none of the above
- (e) all of the above

Ans:

240. A capacitor consists of two

- (a) ceramic plates and one mica disc
- (b) insulators separated by a dielectric
- (c) silver-coated insulators
- (d) conductors separated by an insulator

Ans: d

241. Permittivity is expressed in

- (a) Farad/sq-m
- (b) Farad/metre
- (c) Weber/metre
- (d) Weber/sq-m

Ans: b

242. Dielectric strength of a material depends on

- (a) moisture content
- (b) temperature
- (c) thickness
- (d) all of the above
- (e) none of the above

Ans: d

243. What will happen to an insulating medium if voltage more than the breakdown voltage is applied on it ?

- (a) It will become magnetic
- (b) It will melt
- (c) It will get punctured or cracked
- (d) Its molecular structure will get changed

Ans: c

244. Which medium has the least dielectric strength ?

- (a) Paraffin wax
- (b) Quartz
- (c) Glass
- (d) Air

Ans: d

245. 1 volt/metre is same as

- (a) 1 metre/coulomb
- (b) 1 newton metre
- (c) 1 newton/metre
- (d) 1 joule/coulomb

Ans: c

246. One volt is the same as

- (a) one joule/coulomb
- (b) one coulomb/joule
- (c) one coulomb
- (d) one joule

Ans: a

247. The capacitance between two plates increases with

- (a) shorter plate area and higher applied voltage
- (b) shorter plate area and shorter distance between them
- (c) larger plate area, longer distance between plates and higher, applied voltage
- (d) larger plate area and shorter distance between plates

Ans: d

248. The capacitance C is charged through a resistance R . The time constant of the charging circuit is given by

- (a) CIR
- (b) $1/RC$
- (c) RC
- (d) RIC

Ans: c

249. The bridge used for the measurement of the value of the capacitance is

- (a) Wien's bridge
- (b) Wheatstone bridge
- (c) Schering bridge
- (d) Hay's bridge

Ans: c

250. If an ohmmeter reading immediately goes practically to zero and stays there, capacitor is

- (a) charged
- (b) short-circuited
- (c) lossy
- (d) satisfactory

Ans: b

251. Out of the following capacitors of identical rating which one will have the smallest dimensions ?

- (a) Aluminium foil capacitor
- (b) Mica capacitor
- (c) Ceramic capacitor
- (d) Paper capacitor

Ans: c

252. An uncharged conductor is placed near a charged conductor, then

- (a) the uncharged conductor gets charged by conduction
- (b) the uncharged conductor gets charged by induction and then attracted towards the charging body
- (c) the uncharged conductor is attracted first and then charged by induction
- (d) it remains as such

Ans: b

253. The presence of an uncharged conductor near a charged one increases the

- (a) charge of the charged conductor
- (b) capacity of the charged conductor
- (c) potential of the charged conductor
- (d) all of the above

Ans: b

254. Paper condenser is

- (a) always polarised

- (6) usually of fixed value
- (c) electrolytic condenser
- (d) a variable condenser

Ans: b

255. Mica capacitors are characterised by all of the following except

- (a) stable operation
- (b) accurate value
- (c) low leakage reactance
- (d) low losses

Ans: c

256. A potential of 400 V is applied to a capacitor, the plates of which are 4 mm apart. The strength of electric field is

- (a) 100 kV/m
- (b) 10 kV/m
- (c) 5 kV/m
- (d) 2 kV/m

Ans: a

257. For a good 0.05 μ F capacitor ohmmeter reading should

- (a) show low resistance momentarily and back off to a very high resistance
- (b) show high resistance momentarily and then a very low resistance
- (c) go quickly to 50 ohm approximately and remain there
- (d) not move at all

Ans: a

258. The ohmmeter reading for a short circuited capacitor is

- (a) infinity
- (b) few kilo ohms
- (c) few megaohms
- (d) zero

Ans: d

259. Which of the following statements is correct ?

- (a) Mica capacitors are available in capacitance values of 5 to 20 μ F
- (b) Air capacitors have a black band to indicate the outside foil
- (c) Electrolytic capacitors must be connected in correct polarity
- (d) Ceramic capacitors must be connected in correct polarity

Ans: c

260. Which of the following capacitors preferred for high frequency circuits ?

- (a) Air capacitor
- (b) Electrolytic capacitor
- (c) Mica capacitor
- (d) none of the above

Ans: c

261. An electrolytic capacitor is generally made to provide

- (a) low capacitance
- (b) fixed capacitance
- (c) variable capacitance
- (d) large value of capacitance

Ans: d

262. In order to remove static electricity from machinery

- (a) construct insulated cabins

- (b) insulate the machinery
- (c) ground the framework
- (d) humidify the surroundings

Ans: c

263. If a third equal and similar charge is placed between two equal and similar charges, then this third charge will

- (a) move out of the field of influence of the two charges
- (b) remain in stable equilibrium
- (c) not be in equilibrium
- (d) be in unstable equilibrium

Ans: b

264. A region around a stationary electric charge has

- (a) an electric field
- (b) a magnetic field
- (c) both (a) and (b)
- (d) none of the above

Ans: a

265. The minimum value of potential gradient in a cable occurs in

- (a) insulation
- (b) conductor
- (c) outer sheath
- (d) uniformly all over

Ans: a

266. Dielectric strength of medium

- (a) increases with rise in temperature
- (b) increases with moisture content
- (c) is same for all insulating materials
- (d) none of the above

Ans: d

267. A charge which when placed in vacuum from an equal and similar charge repels with a force of $9 \times 10 \text{ N}$, is known as

- (a) milli-coulomb
- (b) micro-coulomb
- (c) pico-coulomb
- (d) coulomb

Ans: b

268. Dielectric strength of a medium is usually expressed in

- (a) J/mm
- (b) C/m²
- (c) kV/mm
- (d) N/mm

Ans: c

269. A positive and a negative charge are initially 50 mm apart. When they are moved close together so that they are now only 10 mm apart, the force between them will be

- (a) 5 times smaller than before
- (b) 5 times greater than before
- (c) 10 times greater than before
- (d) 25 times larger than before

Ans: d

270. Which is the most superior dielectric out of the following ?

- (a) Air
- (b) Glass
- (c) Bakelite
- (d) Paper

Ans: c

271. When a dielectric is placed in an electric field the field strength

- (a) decreases
- (b) increases
- (c) reduces to zero
- (d) remain unchanged

Ans: a

272. To prevent the generation of static charges on rubber or flat leather

- (a) surface is moistened
- (b) conductive dressing is done
- (c) oil compound dressing is done
- (d) talcum powder is sprayed on the surface

Ans: b

273. Which of the following capacitor is preferred in case of single phase motor ?

- (a) Mica capacitor
- (b) Paper capacitor
- (c) Electrolytic capacitor
- (d) Ceramic capacitor

Ans: c

274. A capacitance is a circuit component that opposes the change in circuit

- (a) current
- (b) voltage
- (c) impedance
- (d) none of the above

Ans: a

275. A condenser suitable for D.C. only is

- (a) metallic plate variable gang condenser
- (b) metallic paper capacitor
- (c) oil impregnated paper condenser
- (d) poled aluminium electrolytic condenser

Ans: d

276. In a capacitor, the electric charge is stored in

- (a) metal plates
- (b) dielectric
- (c) dielectric as well as metal plates
- (d) none of the above

Ans: b

277. An air gap is usually inserted in magnetic circuits to

- (a) increase m.m.f.
- (b) increase the flux
- (c) prevent saturation
- (d) none of the above

Ans: c

278. The relative permeability of a ferromagnetic material is

- (a) less than one
- (b) more than one
- (c) more than 10
- (d) more than 100 or 1000

Ans: d

279. The unit of magnetic flux is

- (a) henry
- (b) weber
- (c) ampere-turn/weber
- (d) ampere/metre

Ans: b

280. Permeability in a magnetic circuit corresponds to _____ in an electric circuit.

- (a) resistance
- (b) resistivity
- (c) conductivity
- (d) conductance

Ans: c

281. Point out the wrong statement.

Magnetic leakage is undesirable in electric machines because it

- (a) lowers their power efficiency
- (b) increases their cost of
- (c) leads to their increased weight
- (d) produces fringing

Ans: a

282. Relative permeability of vacuum is

- (a) 1
- (b) 1 H/m
- (c) $1/4\pi$
- (d) $4\pi \times 10^{-7}$ H/m

Ans: a

283. Permanent magnets are normally made of

- (a) alnico alloys
- (b) aluminium
- (c) cast iron
- (d) wrought iron

Ans: a

284. Energy stored by a coil is doubled when its current is increased by percent.

- (a) 25
- (b) 50
- (c) 41.4
- (d) 100

Ans: c

285. Those magnetic materials are best suited for making armature and transformer cores which have _____ permeability and _____ hysteresis loss.

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

Ans: c

286. The rate of rise of current through an inductive coil is maximum

- (a) at 63.2% of its maximum steady value
- (b) at the start of the current flow
- (c) after one time constant
- (d) near the final maximum value of current

Ans: b

287. When both the inductance and resistance of a coil are doubled the value of

- (a) time constant remains unchanged
- (b) initial rate of rise of current is doubled
- (c) final steady current is doubled
- (d) time constant is halved

Ans: a

288. The initial rate of rise of current through a coil of inductance 10 H when suddenly connected to a D.C. supply of 200 V is _____ Vs

- (a) 50
- (b) 20
- (c) 0.05
- (d) 500

Ans: b

289. A material for good magnetic memory

- (a) low hysteresis loss
- (b) high permeability
- (c) low retentivity
- (d) high retentivity

Ans: d

290. Conductivity is analogous to

- (a) retentivity
- (b) resistivity
- (c) permeability
- (d) inductance

Ans: c

291. In a magnetic material hysteresis loss takes place primarily due to

- (a) rapid reversals of its magnetization
- (b) flux density lagging behind magnetising force
- (c) molecular friction
- (d) its high retentivity

Ans: d

292. Those materials are well suited for making permanent magnets which have _____ retentivity and _____ coercivity.

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

Ans: b

293. If the area of hysteresis loop of a material is , the hysteresis loss in this material will be

- (a) zero
- (b) small
- (c) large
- (d) none of the above

Ans: c

294. Hard steel is suitable for making permanent magnets because

- (a) it has good residual magnetism
- (b) its hysteresis loop has large area
- (c) its mechanical strength is high
- (d) its mechanical strength is low

Ans: a

295. Silicon steel is used in electrical machines because it has

- (a) low co-ercivity
- (b) low retentivity
- (c) low hysteresis loss
- (d) high co-ercivity

Ans: c

296. Conductance is analogous to

- (a) permeance
- (b) reluctance
- (c) flux
- (d) inductance

Ans: a

297. The property of a material which opposes the creation of magnetic flux in it is known as

- (a) reluctivity
- (b) magnetomotive force
- (c) permeance
- (d) reluctance

Ans: d

298. The unit of retentivity is

- (a) weber
- (b) weber/sq. m
- (c) ampere turn/metre
- (d) ampere turn

Ans: b

299. Reciprocal of reluctance is

- (a) reluctivity
- (b) permeance
- (c) permeability
- (d) susceptibility

Ans: b

300. While comparing magnetic and electric circuits, the flux of magnetic circuit is compared with which parameter of electrical circuit ?

- (a) E.m.f.

- (b) Current
- (c) Current density
- (d) Conductivity

Ans: b

301. The unit of reluctance is

- (a) metre/henry
- (b) henry/metre
- (c) henry
- (d) 1/henry

Ans: d

302. A ferrite core has less eddy current loss than an iron core because

- (a) ferrites have high resistance
- (b) ferrites are magnetic
- (c) ferrites have low permeability
- (d) ferrites have high hysteresis

Ans: d

303. Hysteresis loss least depends on

- (a) volume of material
- (b) frequency
- (c) steinmetz co-efficient of material
- (d) ambient temperature

Ans: d

304. Laminated cores, in electrical machines, are used to reduce

- (a) copper loss
- (b) eddy current loss
- (c) hysteresis loss
- (d) all of the above

Ans: b

305. "The mass of an ion liberated at an electrode is directly proportional to the quantity of electricity".

The above statement is associated with

- (a) Newton's law
- (b) Faraday's law of electromagnetic
- (c) Faraday's law of electrolysis
- (d) Gauss's law

Ans: c

306. The charge required to liberate one gram equivalent of any substance is known as _____ constant

- (a) time
- (b) Faraday's
- (c) Boltzman

Ans: b

307. During the charging of a lead-acid cell

- (a) its voltage
- (b) it gives out energy
- (c) its cathode becomes dark chocolate brown in colour
- (d) specific gravity of H_2SO_4 decreases

Ans: a

308. The capacity of a lead-acid cell does not depend on its

- (a) temperature

- (b) rate of charge
- (c) rate of discharge
- (d) quantity of active material

Ans: b

309. During charging the specific gravity of the electrolyte of a lead-acid battery

- (a) increases
- (b) decreases
- (c) remains the same
- (d) becomes zero

Ans: a

310. The active materials on the positive and negative plates of a fully charged lead-acid battery are

- (a) lead and lead peroxide
- (b) lead sulphate and lead
- (c) lead peroxide and lead
- (d) none of the above

Ans: c

310. When a lead-acid battery is in fully charged condition, the colour of its positive plate is

- (a) dark grey
- (b) brown
- (c) dark brown
- (d) none of above

Ans: c

311. The active materials of a nickel-iron battery are

- (a) nickel hydroxide
- (b) powdered iron and its oxide
- (c) 21% solution of KOH
- (d) all of the above

Ans: d

312. The ratio of ampere-hour efficiency to watt-hour efficiency of a lead-acid cell is

- (a) just one
- (b) always greater than one
- (c) always less than one
- (d) none of the above.

Ans: b

313. The best indication about the state of charge on a lead-acid battery is given by

- (a) output voltage
- (b) temperature of electrolyte
- (c) specific gravity of electrolyte
- (d) none of the above

Ans: c

314. The storage battery generally used in electric power station is

- (a) nickel-cadmium battery
- (b) zinc-carbon battery

- (c) lead-acid battery
- (d) none of the above

Ans: c

315. The output voltage of a charger is

- (a) less than the battery voltage
- (b) higher than the battery voltage
- (c) the same as the battery voltage
- (d) none of the above

Ans: b

316. Cells are connected in series in order to

- (a) increase the voltage rating
- (b) increase the current rating
- (c) increase the life of the cells
- (d) none of the above

Ans: a

317. Five 2 V cells are connected in parallel.

The output voltage is

- (a) 1 V
- (b) 1.5 V
- (c) 1.75 V
- (d) 2 V

Ans: d

318. The capacity of a battery is expressed in terms of

- (a) current rating
- (b) voltage rating
- (c) ampere-hour rating
- (d) none of the above

Ans: c

319. During the charging and discharging of a nickel-iron cell

- (a) corrosive fumes are produced
- (b) water is neither formed nor absorbed
- (c) nickel hydroxide remains unsplit
- (d) its e.m.f. remains constant

Ans: b

320. As compared to constant-current system, the constant-voltage system of charging a lead acid cell has the advantage of

- (a) reducing time of charging
- (b) increasing cell capacity
- (c) both (a) and (b)
- (d) avoiding excessive gassing

Ans: c

321. A dead storage battery can be revived by

- (a) adding
- (b) adding so-called battery restorer
- (c) a dose of H_2SO_4
- (d) none of the above

Ans: d

322. As compared to a lead-acid cell, the efficiency of a nickel-iron cell is less due to its

- (a) compactness
- (b) lower e.m.f.
- (c) small quantity of electrolyte used
- (d) higher internal resistance

Ans: d

323. Trickle charging of a storage battery helps to

- (a) maintain proper electrolyte level
- (b) increase its reserve capacity
- (c) prevent sulphation
- (d) keep it fresh and fully charged

Ans: d

324. Those substances of the cell which take active part in chemical combination and hence produce electricity during charging or discharging are known as _____ materials.

- (a) passive
- (b) active
- (c) redundant
- (d) inert

Ans: b

325. In a lead-acid cell dilute sulphuric acid (electrolyte) approximately comprises the following

- (a) one part H₂O, three parts H₂SO₄
- (b) two parts H₂O, two parts H₂SO₄
- (c) three parts H₂O, one part H₂SO₄
- (d) all H₂SO₄

Ans: c

326. It is noticed that during charging

- (a) there is a rise in voltage
- (b) energy is absorbed by the cell
- (c) specific gravity of H₂SO₄ is increased
- (d) the anode becomes chocolate brown in colour (PbO₂) and cathode becomes grey metallic lead (Pb)
- (e) all of the above

Ans: e

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

- (a) both anode and cathode become PbSO₄
- (b) specific gravity of H₂SO₄ decreases
- (c) voltage of the cell decreases
- (d) the cell absorbs energy

Ans: d

328. The ampere-hour efficiency of a lead-acid cell is normally between

- (a) 20 to 30%
- (b) 40 to 50%
- (c) 60 to 70%
- (d) 90 to 95%

Ans: d

329. The watt-hour efficiency of a lead-acid cell varies between

- (a) 25 to 35%
- (b) 40 to 60%
- (c) 70 to 80%
- (d) 90 to 95%

Ans: c

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

- (a) amperes
- (b) ampere-hours
- (c) watts
- (d) watt-hours

Ans: b

331. The capacity of a lead-acid cell depends on

- (a) rate of discharge
- (b) temperature
- (c) density of electrolyte
- (d) quantity of active materials
- (e) all above

Ans: e

332. When the lead-acid cell is fully charged, the electrolyte assumes _____ appearance

- (a) dull
- (b) reddish
- (c) bright
- (d) milky

Ans: d

333. The e.m.f. of an Edison cell, when fully charged, is nearly

- (a) 1.4 V
- (b) 1 V
- (c) 0.9 V
- (d) 0.8 V

Ans: a

334. The internal resistance of an alkali cell is nearly _____ times that of the lead-acid cell.

- (a) two
- (b) three
- (c) four
- (d) five

Ans: d

335. The average charging voltage for alkali cell is about

- (a) 1 V
- (b) 1.2 V
- (c) 1.7 V
- (d) 2.1 V

Ans: c

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

- (a) 40%
- (b) 60%
- (c) 70%
- (d) 80%

Ans: d

337. The active material of the positive plates of silver-zinc batteries is

- (a) silver oxide
- (b) lead oxide
- (c) lead
- (d) zinc powder

Ans: a

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

- (a) 500
- (b) 700
- (c) 1000
- (d) 1250

Ans: d

339. Life of the Edison cell is at least

- (a) five years
- (b) seven years
- (c) eight years
- (d) ten years

Ans: a

340. The internal resistance of a lead-acid cell is _____ that of Edison cell

- (a) less than
- (b) more than
- (c) equal to
- (d) none of the above

Ans: a

341. Electrolyte used in an Edison cell is

- (a) NaOH
- (b) KOH
- (c) HCl
- (d) HNO₃

Ans: b

342. Electrolyte used in a lead-acid cell is

- (a) NaOH
- (b) only H₂SO₄
- (c) only water
- (d) dilute H₂SO₄

Ans: d

343. Negative plate of an Edison cell is made of

- (a) copper
- (b) lead
- (c) iron
- (d) silver oxide

Ans: c

344. The open circuit voltage of any storage cell depends wholly upon

- (a) its chemical constituents
- (b) on the strength of its electrolyte
- (c) its temperature
- (d) all above

Ans: d

345. The specific gravity of electrolyte is measured by

- (a) manometer
- (b) a mechanical gauge
- (c) hydrometer
- (d) psychrometer

Ans: c

346. When the specific gravity of the electrolyte of a lead-acid cell is reduced to 1.1 to 1.15 the cell is in

- (a) charged state
- (b) discharged state
- (c) both (a) and (b)
- (d) active state

Ans: b

347. In _____ system the charging current is intermittently controlled at either a maximum or minimum value

- (a) two rate charge control
- (b) trickle charge
- (c) floating charge
- (d) an equalizing charge

Ans: a

348. Over charging

- (a) produces excessive gassing
- (b) loosens the active material
- (c) increases the temperature resulting in buckling of plates
- (d) all above

Ans: d

349. Undercharging

- (a) reduces specific gravity of the electrolyte
- (b) increases specific gravity of the electrolyte
- (c) produces excessive gassing
- (d) increases the temperature

Ans: a

350. Internal short circuits are caused by

- (a) breakdown of one or more separators
- (b) excess accumulation of sediment at the bottom of the cell
- (c) both (a) and (b)
- (d) none of the above

Ans: c

351. The effect of sulphation is that the internal resistance

- (a) increases
- (b) decreases
- (c) remains same
- (d) none of the above

Ans: a

352. Excessive formation of lead sulphate on the surface of the plates happens

because of

- (a) allowing a battery to stand in discharged condition for a long time
- (b) topping up with electrolyte
- (c) persistent undercharging
- (d) low level of electrolyte
- (e) all above

Ans: e

353. The substances which combine together to store electrical energy during the charge are called _____ materials

- (a) active
- (b) passive
- (c) inert
- (d) dielectric

Ans: a

354. In a lead-acid cell, lead is called as

- (a) positive active material
- (b) negative active material
- (c) passive material
- (d) none of the above

Ans: b

355. The lead-acid cell should never be discharged beyond

- (a) 1.8 V
- (b) 1.9 V
- (c) 2 V
- (d) 2.1 V

Ans: a

356. On overcharging a battery

- (a) it will bring about chemical change in active materials
- (b) it will increase the capacity of the battery
- (c) it will raise the specific gravity of the electrolyte
- (d) none of the above will occur

Ans: d

357. Each cell has a vent cap

- (a) to allow gases out when the cell is on charge
- (b) to add water to the cell if needed
- (c) to check the level of electrolyte
- (d) to do all above functions

Ans: d

358. Following will occur if level of electrolyte falls below plates

- (a) capacity of the cell is reduced
- (b) life of the cell is reduced
- (c) open plates are converted to lead sulphate
- (d) all above

Ans: d

359. In constant voltage charging method, the charging current from discharged to fully charged condition

- (a) decreases
- (b) increases
- (c) remains constant
- (d) none of the above

Ans: a

360. 48 ampere-hour capacity would deliver a current of

- (a) 48 amperes for 1 hour
- (b) 24 amperes for 2 hours
- (c) 8 amperes for 6 hours
- (d) 6 amperes for 8 hours

Ans: d

361. In constant-current charging method, the supply voltage from discharged to fully charged condition

- (a) decreases
- (b) increases
- (c) remains constant
- (d) none of the above

Ans: b

362. Battery charging equipment is generally installed

- (a) in well ventilated location
- (b) in clean and place
- (c) as near as practical to the battery being charged
- (d) in location having all above features

Ans: d

363. Following will happen if the specific gravity of electrolyte becomes more than 1.23.

- (a) Loss of capacity
- (b) Loss of life
- (c) Corrosion of the grids of the plate
- (d) All above

Ans: d

364. Batteries are charged by

- (a) rectifiers
- (b) engine generator sets
- (c) motor generator sets
- (d) any one of the above methods

Ans: d

365. Cell short circuit results in

- (a) low sp. gravity electrolyte
- (b) abnormal high temperature
- (c) reduced gassing on charge
- (d) all above

Ans: d

366. Internal resistance of a cell is reduced by

- (a) using vent plug to permit gas formed during discharge

- (b) increasing the plate area
- (c) putting plates very close together
- (d) all above methods

Ans: d

367. Capacity of dry cells is

- (a) more when it is supplying current for intermittent periods
- (b) more when it is supplying current for continuous periods
- (c) unaffected by the type of discharge
- (d) none of the above

Ans: a

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

- (a) glass
- (b) plastic
- (c) wood
- (d) all above

Ans: d

369. Sulphated cells are indicated by

- (a) the loss of capacity of the cell
- (b) the decrease of the specific gravity
- (c) the low voltage of the cell on discharge
- (d) all above conditions

Ans: d

370. In a lead-acid cell, if the specific gravity of sulphuric acid is 1.8, it will require following ratio of acid to water to get mixture of specific gravity of 1.3

- (a) 6 parts of acid to 4 parts of water
- (b) 4 parts of acid to 4 parts of water
- (c) 4 parts of acid to 6 parts of water
- (d) 4 parts of acid to 8 parts of water

Ans: c

371. Local action in a battery is indicated by

- (a) excessive gassing under load conditions
- (b) excessive drop in the specific gravity of electrolyte even when the cell is on open circuit
- (c) both (a) and (b)
- (d) none of the above

Ans: d

372. Following will happen if battery charging rate is too high

- (a) excessive gassing will occur
- (b) temperature rise will occur
- (c) bulging and buckling of plates will occur
- (d) all above will occur

Ans: d

373. Internal resistance of a cell is due to

- (a) resistance of electrolyte
- (b) electrode resistance
- (c) surface contact resistance between electrode and electrolyte
- (d) all above

Ans: d

374. If a battery is wrongly connected on charge following will happen

- (a) current delivered by the battery will be high
- (b) current drawing will be nil
- (c) current drawing will be very small
- (d) current drawing will be very high

Ans: d

375. In order that a hydrometer may float vertically in electrolyte its C.G. should be

- (a) lowered
- (b) raised
- (c) undisturbed
- (d) displaced sideways

Ans: a

376. If a lead-acid cell is discharged below 1.8 V the following will happen.

- (a) Capacity of cell will reduce
- (b) Sulphation of plates will occur
- (c) Internal resistance will increase
- (d) All above will occur

Ans: d

377. Life of the batteries is in the following ascending order.

- (a) Lead-acid cell, Edison cell, Nickel cadmium cell
- (b) Lead-acid cell, Nickel-cadmium cell, Edison cell
- (c) Edison cell, Nickel-cadmium cell, lead-acid cell
- (d) Nickel-cadmium cell, Edison cell, lead-acid cell

Ans: a

378. Persons preparing electrolyte should wear

- (a) goggles or other face shield
- (b) rubber
- (c) rubber boots and gloves
- (d) all above safety devices

Ans: d

379. Excessive charging a battery tends to

- (a) produce gassing
- (b) increase the internal resistance of the battery
- (c) to corrode the positive plates into lead peroxide thereby weakening them physically
- (d) bring about all above changes

Ans: d

380. Shelf life of a small dry cell is

- (a) equal to that of large dry cell
- (b) less than that of large dry cell
- (c) more than that of large dry cell
- (d) none of the above

Ans: b

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

- (a) ions
- (b) holes
- (c) electrons
- (d) none of the above

Ans: a

382. Level of electrolyte in a cell should be _____ the level of plates

- (a) below
- (b) equal to
- (c) above
- (d) none of the above

Ans: c

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

- (a) Pb
- (b) PbO₂
- (c) PbO
- (d) PbSO₄

Ans: d

384. _____ of electrolyte indicates the state of charge of the battery

- (a) colour
- (b) mass
- (c) viscosity
- (d) specific gravity

Ans: d

385. The following indicate that battery on charge has attained full charge

- (a) colour of electrode
- (b) gassing
- (c) specific gravity
- (d) all above

Ans: d

386. Dry cell is modification of

- (a) Daniell cell
- (b) Leclanche cell
- (c) Lead-acid cell
- (d) Edison cell

Ans: b

387. Capacity of a battery is expressed in

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

Ans: a

388. In alkaline cell the electrolyte is

- (a) dilute sulphuric acid
- (b) concentrated sulphuric acid
- (c) NaOH
- (d) KOH

Ans: d

389. Self charge of a Ni-Fe cell is _____ Edison cell.

- (a) equal to
- (b) less than
- (c) more than
- (d) much more than

Ans: b

390. Ampere hour capacity of an industrial battery is based on ____ hours discharge rate.

- (a) 8
- (b) 12
- (c) 16
- (d) 24

Ans: a

391. The body of Edison cell is made of

- (a) bakelite
- (b) rubber
- (c) nickel plated steel
- (d) aluminium

Ans: c

392. Specific gravity of electrolyte in Edison cell is

- (a) 0.8
- (b) 0.95
- (c) 1.1
- (d) 1.21

Ans: d

393. All the electrical connections between the battery and vehicle should be by

- (a) thin aluminium wires
- (b) thin copper wires
- (c) rigid cables
- (d) flexible cables

Ans: d

394. A battery of 6 cells will show a drop of ____ volts from fully charged state to fully discharged state.

- (a) 1.0
- (b) 1.5
- (c) 2.4
- (d) 2.9

Ans: c

395. During the idle period of the battery, strong electrolyte tends to change the active material of the cell into

- (a) PbO_2
- (b) $PbSO_4$
- (c) PbO
- (d) Pb

Ans: b

396. Charging of sulphated battery produces ____ heat.

- (a) no
- (b) very little
- (c) less
- (d) more

Ans: d

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

- (a) 2%
- (b) 4%

(c) 6%

(d) 8%

Ans: d

398. Weston standard cell at 20°C has voltage of ____ volts.

(a) 0.8

(b) 0.9

(c) 1.0187

(d) 1.5

Ans: c

399. Extent of corrosion in the underground metal work depends upon

(a) amount of moisture

(b) type of metals

(c) type of soil chemicals

(d) all above factors

Ans: d

400. Mercury cell has which of the following characteristics ?

(a) Flat discharge current-voltage curve

(b) High power to weight ratio

(c) Comparatively longer shelf life under adverse conditions of high temperature and humidity

(d) All of the above

Ans: d

401. Charging a sulphated battery at high rate results in

(a) boiling of electrolyte due to gassing

(b) warping of plates

(c) damage to separators, cell caps covers and battery case due to excessive temperature

(d) all above

Ans: d

402. Short circuiting of a cell may be caused

(a) buckling of plates

(b) faulty separators

(c) lead particles forming circuit between positive and negative plates

(d) excessive accumulation of sediment

(e) any one of above

Ans: e

403. In a battery cover is placed over the element and sealed to the top of the battery container. This is done

(a) to reduce evaporation of water from electrolyte

(b) to exclude dirt and foreign matter from the electrolyte

(c) to discharge both of the above functions

(d) to discharge none of the above functions

Ans: c

404. For a cell to work, which of the following condition(s) become necessary ?

(a) Two electrodes of different metals should be inserted in the electrolyte, not touching each other

(b) Electrolyte must chemically react with one of the electrodes

(c) Electrolyte liquid or paste should be conducting

(d) All above three conditions are necessary

Ans: d

405. Which of the following primary cells has the lowest voltage ?

- (a) Lithium
- (b) Zinc-chloride
- (c) Mercury
- (d) Carbon-zinc

Ans: c

406. Which of the following primary cells has the highest voltage ?

- (a) Manganese-alkaline
- (b) Carbon-zinc
- (c) Lithium
- (d) Mercury

Ans: c

407. While preparing electrolyte for a lead-acid battery

- (a) water is poured into acid
- (b) acid is poured into water
- (c) anyone of the two can be added to other chemical

Ans: b

408. Which of the following battery is used for air-craft ?

- (a) Lead-acid battery
- (b) Nickel-iron battery
- (c) Dry cell battery
- (d) Silver oxide battery

Ans: b

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

- (a) Lead-acid
- (b) Mercury oxide
- (c) Carbon-zinc
- (d) Silver-oxide

Ans: a

410. Which of the following is incorrect ?

- (a) A storage cell has a reversible chemical reaction
- (b) A lead-acid cell can be recharged
- (c) A carbon-zinc cell has unlimited shelf life
- (d) A primary cell has an irreversible chemical reaction

Ans: c

411. Which of the following has lower sp. gravity V

- (a) Dilute H_2SO_4
- (b) Concentrated H_2SO_4
- (c) Water
- (d) Any of the above

Ans: c

412. Under normal charging rate, the charging current should be

- (a) 10% of capacity
- (b) 20% of capacity
- (c) 30% of capacity
- (d) 40% of capacity

Ans: a

413. When two batteries are connected in parallel, it should be ensured that

- (a) they have same e.m.f.
- (b) they have same make
- (c) they have same ampere-hour capacity
- (d) they have identical internal resistance

Ans: a

414. A typical output of a solar cell is

- (a) 0.1V
- (b) 0.26 V
- (c) 1.1 V
- (d) 2 V

Ans: b

415. Petroleum jelly is applied to the electrical connections to the lead-acid battery

- (a) prevent local heating
- (b) prevent short-circuiting
- (c) reduce path resistance
- (d) prevent corrosion

Ans: d

416. When the load resistance equals the generator resistance which of the following will be maximum ?

- (a) Current
- (b) Efficiency of the circuit
- (c) Power in the load resistance
- (d) Voltage across the load resistance

Ans: c

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

- (a) chlorine
- (b) dust particles
- (c) lead crystals
- (d) iron

Ans: d

418. In a lead-acid battery the energy is stored in the form of

- (a) charged ions
- (b) chemical energy
- (c) electrostatic energy
- (d) electromagnetic energy

Ans: b

419. Which among the following constitutes the major load for an engine ?

- (a) Ignition system
- (b) Self starter
- (c) Parking lights
- (d) Spark plugs

Ans: b

420. Which of the following factors adversely affects the capacity of the leadacid battery ?

- (a) Temperature of surroundings
- (b) Specific gravity of electrolyte
- (c) Rate of discharge
- (d) All of the above

Ans: d

421. Cells are connected in parallel to

- (a) increase the efficiency
- (b) increase the current capacity
- (c) increase the voltage output
- (d) increase the internal resistance

Ans: b

422. A constant-voltage generator has

- (a) minimum efficiency
- (b) minimum current capacity
- (c) low internal resistance
- (d) high internal resistance

Ans: c 423. The property of coil by which a counter e.m.f. is induced in it when the current through the coil changes is known as

- (a) self-inductance
- (b) mutual inductance
- (c) series aiding inductance
- (d) capacitance

Ans: a

424. As per Farada y's laws of electromagnetic induction, an e.m.f. is induced in a conductor whenever it

- (a) lies perpendicular to the magnetic flux
- (b) lies in a magnetic field
- (e) cuts magnetic flux
- (d) moves parallel to the direction of the magnetic field

Ans: c

425. Which of the following circuit element stores energy in the electromagnetic field ?

- (a) Inductance
- (b) Condenser
- (c) Variable resistor
- (d) Resistance

Ans: a

426. The inductance of a coil will increase under all the following conditions except

- (a) when more length for the same number of turns is provided
- (6) when the number of turns of the coil increase
- (c) when more area for each turn is provided
- (d) when permeability of the core

Ans: a

427. Higher the self-inductance of a coil,

- (a) lesser its weber-turns
- (b) lower the e.m.f. induced
- (c) greater the flux produced by it
- (d) longer the delay in establishing steady current through it

Ans: d

428. In an iron cored coil the iron core is removed so that the coil becomes an air cored coil. The inductance of the coil will

- (a) increase
- (b) decrease
- (c) remain the same
- (d) initially increase and then decrease

Ans: b

429. An open coil has

- (a) zero resistance and inductance
- (b) infinite resistance and zero inductance
- (c) infinite resistance and normal inductance
- (d) zero resistance and high inductance

Ans: b

430. Both the number of turns and the core length of an inductive coil are doubled.

Its self-inductance will be

- (a) unaffected
- (b) doubled
- (c) halved
- (d) quadrupled

Ans: b

431. If current in a conductor increases then according to Lenz's law self-induced voltage will

- (a) aid the increasing current
- (b) tend to decrease the amount of current
- (c) produce current opposite to the increasing current
- (d) aid the applied voltage

Ans: c

432. The direction of induced e.m.f. can be found by

- (a) Laplace's law
- (b) Lenz's law
- (c) Fleming's right hand rule
- (d) Kirchhoff's voltage law

Ans: b

433. Air-core coils are practically free from

- (a) hysteresis losses
- (b) eddy current losses
- (c) both (a) and (b)
- (d) none of the above

Ans: c

434. The magnitude of the induced e.m.f. in a conductor depends on the

- (a) flux density of the magnetic field
- (b) amount of flux cut
- (c) amount of flux linkages
- (d) rate of change of flux-linkages

Ans: d

435. Mutually inductance between two magnetically-coupled coils depends on

- (a) permeability of the core
- (b) the number of their turns
- (c) cross-sectional area of their common core
- (d) all of the above

Ans: d

436. A laminated iron core has reduced eddy-current losses because

- (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 core
- (d) the laminations are stacked vertically

Ans: b

437. The law that the induced e.m.f. and current always oppose the cause producing them is due to

- (a) Faraday
- (b) Lenz
- (c) Newton
- (d) Coulomb

Ans: b

438. Which of the following is not a unit of inductance ?

- (a) Henry
- (b) Coulomb/volt ampere
- (c) Volt second per ampere
- (d) All of the above

Ans: b

439. In case of an inductance, current is proportional to

- (a) voltage across the inductance
- (b) magnetic field
- (c) both (a) and (b)
- (d) neither (a) nor (b)

Ans: b

440. Which of the following circuit elements will oppose the change in circuit current ?

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

Ans: b

441. For a purely inductive circuit which of the following is true ?

- (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

Ans: c

442. Which of the following is unit of inductance ?

- (a) Ohm
- (b) Henry
- (c) Ampere turns
- (d) Webers/metre

Ans: b

443. An e.m.f. of 16 volts is induced in a coil of inductance 4H. The rate of change of current must be

- (a) 64 A/s
- (b) 32 A/s
- (c) 16 A/s
- (d) 4 A/s

Ans: d

444. 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 in ductance will be

- (a) 3 mH
- (b) 12 mH
- (c) 24mH
- (d)48mH

Ans: a

445. 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

- (a) 4 mH
- (b) 5 mH
- (c) 6 mH
- (d) 12 mH

Ans: c

446. Two coils have inductances of 8 mH and 18 mH and a co-efficient of coupling of 0.5. If the two coils are connected in series aiding, the total inductance will be

- (a) 32 mH
- (b) 38 mH
- (c) 40 mH
- (d) 48 mH

Ans: b

447. A 200 turn coil has an inductance of 12 mH. If the number of turns is increased to 400 turns, all other quantities (area, length etc.) remaining the same, the inductance will be

- (a) 6 mH
- (b) 14 mH
- (c) 24 mH
- (d) 48 mH

Ans: d

448. Two coils have self-inductances of 10 H and 2 H, the mutual inductance being zero. If the two coils are connected in series, the total inductance will be

- (a) 6 H
- (b) 8 H
- (c) 12 H
- (d) 24 H

Ans: c

449. In case all the flux from the current in coil 1 links with coil 2, the co-efficient of coupling will be

- (a) 2.0
- (b) 1.0
- (c) 0.5
- (d) zero

Ans: b

450. A coil with negligible resistance has 50V across it with 10 mA. The inductive reactance is

- (a) 50 ohms
- (b) 500 ohms
- (c) 1000 ohms
- (d) 5000 ohms

Ans: d

451. 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

- (a) 10 V
- (b) 15 V
- (c) 25V
- (d) 50V

Ans: c

452. Lenz's law is a consequence of the law of conservation of

- (a) induced current
- (b) charge
- (c) energy
- (d) induced e.m.f.

Ans: c

453. A conductor carries 125 amperes of current under 60° to a magnetic field of 1.1 tesla. The force on the conductor will be nearly

- (a) 50 N
- (b) 120 N
- (c) 240 N
- (d) 480 N

Ans: b

454. Find the force acting on a conductor 3m long carrying a current of 50 amperes at right angles to a magnetic field having a flux density of 0.67 tesla.

- (a) 100 N

- (b) 400 N
- (c) 600 N
- (d) 1000 N

Ans: a

455. The co-efficient of coupling between two air core coils depends on

- (a) self-inductance of two coils only
- (b) mutual inductance between two coils only
- (c) mutual inductance and self inductance of two coils
- (d) none of the above

Ans: c

456. An average voltage of 10 V is induced in a 250 turns solenoid as a result of a change in flux which occurs in 0.5 second. The total flux change is

- (a) 20 Wb
- (b) 2 Wb
- (c) 0.2 Wb
- (d) 0.02 Wb

Ans: d

457. A 500 turns solenoid develops an average induced voltage of 60 V. Over what time interval must a flux change of 0.06 Wb occur to produce such a voltage ?

- (a) 0.01 s
- (b) 0.1 s
- (c) 0.5 s
- (d) 5 s

Ans: c

458. Which of the following inductor will have the least eddy current losses ?

- (a) Air core
- (b) Laminated iron core
- (c) Iron core
- (d) Powdered iron core

Ans: a

459. A coil induces 350 mV when the current changes at the rate of 1 A/s. The value of inductance is

- (a) 3500 mH
- (b) 350 mH
- (c) 250 mH
- (d) 150 mH

Ans: b

460. Two 300 μ H coils in series without mutual coupling have a total inductance of

- (a) 300 μ H
- (b) 600 μ H
- (c) 150 μ H
- (d) 75 μ H

Ans: b

461. Current changing from 8 A to 12 A in one second induced 20 volts in a coil.

The value of inductance is

- (a) 5 mH
- (b) 10 mH
- (c) 5 H
- (d) 10 H

Ans: c

462. Which circuit element(s) will oppose the change in circuit current ?

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

Ans: b

463. A crack in the magnetic path of an inductor will result in

- (a) unchanged inductance
- (b) increased inductance
- (c) zero inductance
- (d) reduced inductance

Ans: d

464. A coil is wound on iron core which carries current I . The self-induced voltage in the coil is not affected by

- (a) variation in coil current
- (b) variation in voltage to the coil
- (c) change of number of turns of coil
- (d) the resistance of magnetic path

Ans: b

465. A moving magnetic field will produce the same effect as a conductor that is moving.

- (a) Yes
- (b) No

Ans:

466. The polarity of the induced voltage can be determined by using the left-hand generator rule.

- (a) Yes
- (b) No

Ans: a

467. Increasing the field or increasing the current will decrease the force on the conductor.

- (a) Yes
- (b) No

Ans: b

468. Reversing the field or the current will reverse the force on the conductor.

- (a) Yes
- (b) No

Ans: a

469 When a conductor moves in the field, so that it makes an angle θ with the lines of flux, the force F is given as : $F = BIl \sin \theta$.

(a) Yes

(b) No

Ans: b

470. The self-inductance of the coil may be defined as equal to the e.m.f. induced in volts when the current in the circuit changes at the rate of unit weber turns.

(a) Yes

(b) No

Ans: b

471. Laminations of core are generally made of

(a) cast iron

(b) carbon

(c) silicon steel

(d) stainless steel

Ans: c

472. Which of the following could be approximately the thickness of laminations of a D.C. machine ?

(a) 0.005 mm

(b) 0.05 mm

(c) 0.5 mm

(d) 5 mm

Ans: c

473. The armature of D.C. generator is laminated to

(a) reduce the bulk

(b) provide the bulk

(c) insulate the core

(d) reduce eddy current loss

Ans: d

474. The resistance of armature winding depends on

(a) length of conductor

(b) cross-sectional area of the conductor

(c) number of conductors

(d) all of the above

Ans: d

475. The field coils of D.C. generator are usually made of

(a) mica

(b) copper

(c) cast iron

(d) carbon

Ans: b

476. The commutator segments are connected to the armature conductors by means of

- (a) copper lugs
- (b) resistance wires
- (c) insulation pads

Ans: a

477. In a commutator

- (a) copper is harder than mica
- (b) mica and copper are equally hard
- (c) mica is harder than copper
- (d) none of the above

Ans: c

478. In D.C. generators the pole shoes are fastened to the pole core by

- (a) rivets
- (b) counter sunk screws
- (c) brazing
- (d) welding

Ans: b

479. According to Fleming's right-hand rule for finding the direction of induced e.m.f., when middle finger points in the direction of induced e.m.f., forefinger will point in the direction of

- (a) motion of conductor
- (b) lines of force
- (c) either of the above
- (d) none of the above

Ans: b

480. Fleming's right-hand rule regarding direction of induced e.m.f., correlates

- (a) magnetic flux, direction of current flow and resultant force
- (b) magnetic flux, direction of motion and the direction of e.m.f. induced
- (c) magnetic field strength, induced voltage and current
- (d) magnetic flux, direction of force and direction of motion of conductor

Ans: b

481. While applying Fleming's right-hand rule to find the direction of induced e.m.f., the thumb points towards

- (a) direction of induced e.m.f.
- (b) direction of flux
- (c) direction of motion of the conductor if forefinger points in the direction of generated e.m.f.
- (d) direction of motion of conductor, if forefinger points along the lines of flux

Ans: d

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

- (a) ball bearings
- (b) bush bearings
- (c) magnetic bearings
- (d) needle bearing

Ans: a

483. In D.C. generators, the cause of rapid brush wear may be

- (a) severe sparking
- (b) rough commutator surface
- (c) imperfect contact
- (d) any of the above

Ans: d

484. In lap winding, the number of brushes is always

- (a) double the number of poles
- (b) same as the number of poles
- (c) half the number of poles
- (d) two

Ans: b

485. For a D.C. generator when the number of poles and the number of armature conductors is fixed, then which winding will give the higher e.m.f. ?

- (a) Lap winding
- (b) Wave winding
- (c) Either of (a) and (b) above
- (d) Depends on other features of design

Ans: b

486. In a four-pole D.C. machine

- (a) all the four poles are north poles
- (b) alternate poles are north and south
- (c) all the four poles are south poles
- (d) two north poles follow two south poles

Ans: b

487. Copper brushes in D.C. machine are used

- (a) where low voltage and high currents are involved
- (b) where high voltage and small currents are involved
- (c) in both of the above cases
- (d) in none of the above cases

Ans: a

488. A separately excited generator as compared to a self-excited generator

- (a) is amenable to better voltage control
- (b) is more stable
- (c) has exciting current independent of load current
- (d) has all above features

Ans: d

489. In case of D.C. machines, mechanical losses are primary function of

- (a) current
- (b) voltage

- (c) speed
- (d) none of above

Ans: c

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

- (a) speed
- (b) load
- (c) voltage
- (d) speed and voltage

Ans: b

491. In D.C. generators, current to the external circuit from armature is given through

- (a) commutator
- (b) solid connection
- (c) slip rings
- (d) none of above

Ans: a

492. Brushes of D.C. machines are made of

- (a) carbon
- (b) soft copper
- (c) hard copper
- (d) all of above

Ans: a

493. If B is the flux density, l the length of conductor and v the velocity of conductor, then induced e.m.f. is given by

- (a) Blv
- (b) Blv^2
- (c) Bl^2v
- (d) Bl^2v^2

Ans: a

494. In case of a 4-pole D.C. generator provided with a two layer lap winding with sixteen coils, the pole pitch will be

- (a) 4
- (b) 8
- (c) 16
- (d) 32

Ans: b

495. The material for commutator brushes is generally

- (a) mica
- (b) copper
- (c) cast iron
- (d) carbon

Ans: d

496. The insulating material used between the commutator segments is normally

- (a) graphite
- (b) paper
- (c) mica
- (d) insulating varnish

Ans: c

497. In D.C. generators, the brushes on commutator remain in contact with conductors which

- (a) lie under south pole
- (b) lie under north pole
- (c) lie under interpolar region
- (d) are farthest from the poles

Ans: c

498. If brushes of a D.C. generator are moved in order to bring these brushes in magnetic neutral axis, there will be

- (a) demagnetisation only
- (b) cross magnetisation as well as magnetisation
- (c) crossmagnetisation as well as demagnetising
- (d) cross magnetisation only

Ans: c

499. Armature reaction of an unsaturated D.C. machine is

- (a) crossmagnetising
- (b) demagnetising
- (c) magnetising
- (d) none of above

Ans: a

500. D.C. generators are connected to the busbars or disconnected from them only under the floating condition

- (a) to avoid sudden loading of the primemover
- (b) to avoid mechanical jerk to the shaft
- (c) to avoid burning of switch contacts
- (d) all above

Ans: d

501. Eddy currents are induced in the pole shoes of a D.C. machine due to

- (a) oscillating magnetic field
- (b) pulsating magnetic flux
- (c) relative rotation between field and armature
- (d) all above

Ans: c

502. In a D.C. machine, short-circuited field coil will result in

- (a) odour of burning insulation
- (b) unbalanced magnetic pull producing vibrations
- (c) reduction of generated voltage for which excitation has to be increased to maintain the voltage
- (d) all above

Ans: d

503. Equilizer rings are required in case armature is

- (a) wave wound
- (b) lap wound
- (c) delta wound
- (d) duplex wound

Ans: b

504. Welding generator will have

- (a) lap winding
- (b) wave winding
- (c) delta winding
- (d) duplex wave winding

Ans: a

505. In case of D.C. machine winding, number of commutator segments is equal to

- (a) number of armature coils
- (b) number of armature coil sides
- (c) number of armature conductors
- (d) number of armature turns

Ans: a

506. For a D.C. machines laboratory following type of D.C. supply will be suitable

- (a) rotary converter
- (b) mercury arc rectifier
- (c) induction motor D.C. generator set
- (d) synchronous motor D.C. generator set

Ans: c

507. The function of pole shoes in the case of D.C. machine is

- (a) to reduce the reluctance of the magnetic path
- (b) to spread out the flux to achieve uniform flux density
- (c) to support the field coil
- (d) to discharge all the above functions

Ans: d

508. In the case of lap winding resultant pitch is

- (a) multiplication of front and back pitches
- (b) division of front pitch by back pitch
- (c) sum of front and back pitches
- (d) difference of front and back pitches

Ans: d

509. A D.C. welding generator has

- (a) lap winding
- (b) wave winding
- (c) duplex winding
- (d) any of the above

Ans: a

510. Which of the following statement about D.C. generators is false ?

- (a) Compensating winding in a D.C. machine helps in commutation
- (b) In a D. C. generator interpoles winding is connected in series with the armature winding
- (c) Back pitch and front pitch are both odd and approximately equal to the pole pitch
- (d) Equilizing bus bars are used with parallel running of D.C. shunt generators

Ans: d

511. The demagnetising component of armature reaction in a D.C. generator

- (a) reduces generator e.m.f.
- (b) increases armature speed
- (c) reduces interpoles flux density
- (d) results in sparking trouble

Ans: a

512. Magnetic field in a D.C. generator is produced by

- (a) electromagnets
- (b) permanent magnets
- (c) both (a) and (b)
- (d) none of the above

Ans: a

513. The number of brushes in a commutator depends on

- (a) speed of armature
- (b) type of winding
- (c) voltage
- (d) amount of current to be collected

Ans: d

514. Compensating windings are used in D.C. generators

- (a) mainly to reduce the eddy currents by providing local short-circuits
- (b) to provide path for the circulation of cooling air
- (c) to neutralise the cross-magnetising effect of the armature reaction
- (d) none of the above

Ans: c

515. Which of the following components of a D.C. generator plays vital role for providing direct current of a D.C. generator ?

- (a) Dummy coils
- (b) Commutator
- (c) Eye bolt
- (d) Equilizer rings

Ans: b

516. In a D.C. generator the ripples in the direct e.m.f. generated are reduced by

- (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

Ans: c

517. In D.C. generators, lap winding is used for

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

Ans: b

518. Two generators A and B have 6-poles each. Generator A has wave wound armature while generator B has lap wound armature. The ratio of the induced e.m.f. is generator A and B will be

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

Ans: b

519. The voltage drop for which of the following types of brush can be expected to be least ?

- (a) Graphite brushes
- (b) Carbon brushes
- (c) Metal graphite brushes
- (d) None of the above

Ans: c

520. The e.m.f. generated by a shunt wound D.C. generator is E . Now while pole flux remains _____, if the speed of the generator is doubled, the e.m.f. generated will be

- (a) $E/2$
- (b) $2E$
- (c) slightly less than E
- (d) E

Ans: b

521. In a D.C. generator the actual flux distribution depends upon

- (a) size of air gap
- (b) shape of the pole shoe
- (c) clearance between tips of the adjacent pole shoes
- (d) all of the above

Ans:

522. The armature core of a D.C. generator is usually made of

- (a) silicon steel
- (b) copper
- (c) non-ferrous material
- (d) cast-iron

Ans: a

523. Satisfactory commutation of D.C. machines requires

- (a) brushes should be of proper grade and size

- (b) brushes should smoothly run in the holders
- (c) smooth, concentric commutator properly undercut
- (d) all of the above

Ans: d

524. Open circuited armature coil of a D.C. machine is

- (a) identified by the scarring of the commutator segment to which open circuited coil is connected
- (b) indicated by a spark completely around the commutator
- (c) both (a) and (b)
- (d) none of the above

Ans: c

525. In a D.C. machine, fractional pitch winding is used

- (a) to increase the generated voltage
- (b) to reduce sparking
- (c) to save the copper because of shorter end connections
- (d) due to (b) and (c) above

Ans:

526. For the parallel operation of two or more D.C. compound generators, we should ensure that

- (a) voltage of the incoming generator should be same as that of bus bar
- (b) polarity of incoming generator should be same as that of bus bar
- (c) all the series fields should be run in parallel by means of equalizer connection
- (d) series fields of all generators should be either on positive side or negative side of the armature
- (e) all conditions mentioned above should be satisfied

Ans: d

527. D.C. series generator is used

- (a) to supply traction load
- (b) to supply industrial load at constant voltage
- (c) voltage at the load end of the feeder
- (d) for none of the above purpose

Ans: c

528. Following D.C. generator will be in a position to build up without any magnetism in the poles

- (a) series generator
- (b) shunt generator
- (c) compound generator
- (d) self-excited generator

Ans: d

529. Interpole flux should be sufficient to

- (a) neutralise the commutating self induced e.m.f.
- (b) neutralise the armature reaction flux
- (c) neutralise both the armature reaction flux as well as commutating e.m.f. induced in the coil
- (d) perform none of the above functions

Ans: c

530. D.C. generator generally preferred for charging automobile batteries is

- (a) series generator
- (b) shunt generator
- (c) long shunt compound generator
- (d) any of the above

Ans: c

531. In a D.C. generator the number of mechanical degrees and electrical degrees will be the same when

- (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

Ans: d

532. Permeance is the reciprocal of

- (a) flux density
- (b) reluctance
- (c) ampere-turns
- (d) resistance

Ans: b

533. In D.C. generators the polarity of the interpoles

- (a) is the same as that of the main pole ahead
- (b) is the same as that of the immediately preceding pole
- (c) is opposite to that of the main pole ahead
- (d) is neutral as these poles do not play part in generating e.m.f.

Ans: a

534. The e.m.f. generated in a D.C. generator is directly proportional to

- (a) flux/pole
- (b) speed of armature
- (c) number of poles
- (d) all of the above

Ans: b

535. In a D.C. generator the magnetic neutral axis coincides with the geometrical neutral axis, when

- (a) there is no load on the generator
- (b) the generator runs on full load
- (c) the generator runs on overload
- (d) the generator runs on designed speed

Ans: a

536. In a D.C. generator in order to reduce sparking at brushes, the self-induced e.m.f. in the coil is neutralised by all of the following except

- (a) interpoles
- (b) dummy coils
- (c) compensating winding
- (d) shifting of axis of brushes

Ans: b

537. In D.C. generators on no-load, the air gap flux distribution in space is

- (a) sinusoidal
- (b) triangular
- (c) pulsating
- (d) flat topped

Ans: d

538. A shunt generator running at 1000 r.p.m. has generated e.m.f. as 200 V. If the speed increases to 1200 r.p.m., the generated e.m.f. will be nearly

- (a) 150 V
- (b) 175 V
- (c) 240 V
- (d) 290 V

Ans: c

539. The purpose of providing dummy coils in a generator is

- (a) to reduce eddy current losses
- (b) to enhance flux density
- (c) to amplify voltage
- (d) to provide mechanical balance for the rotor

Ans: d

540. In a shunt generator the voltage build up is generally restricted by

- (a) speed limitation
- (b) armature heating
- (c) insulation restrictions
- (d) saturation of iron

Ans:

541. If a D.C. generator fails to build up the probable cause could not be

- (a) imperfect brush contact
- (b) field resistance less than the critical resistance
- (c) no residual magnetism in the generator
- (d) faulty shunt connections tending to reduce the residual magnetism

Ans: b

542. Flashing the field of D.C. generator means

- (a) neutralising residual magnetism
- (b) creating residual magnetism by a D.C. source
- (c) making the magnetic losses of forces parallel
- (d) increasing flux density by adding extra turns of windings on poles

Ans: b

543. The e.m.f. induced in the armature of a shunt generator is 600 V. The armature resistance is 0.1 ohm. If the armature current is 200 A, the terminal voltage will be

- (a) 640 V
- (b) 620 V

(c) 600 V

(d) 580 V

Ans: d

544. In a D.C. generator the critical resistance refers to the resistance of

(a) brushes

(b) field

(c) armature

(d) load

Ans: b

545. To achieve sparkless commutation brushes of a D.C. generator are rocked ahead so as to bring them

(a) just ahead of magnetic neutral axis

(b) in magnetic neutral axis

(c) just behind the magnetic neutral axis

Ans: a

546. Armature coil is short circuited by brushes when it lies

(a) along neutral axis

(b) along field axis

(c) in any of the above positions

(d) in none of the above positions

Ans: a

547. A cumulatively compounded long shunt generator when operating as a motor would be

(a) cumulatively compounded long shunt

(b) differentially compounded long shunt

(c) cumulatively compounded short shunt

(d) differentially compounded short shunt

Ans: b

548. To avoid formation of grooves in the commutator of a D.C. machine

(a) the brushes of opposite polarity should track each other

(b) the brushes of same polarity should track each other

(c) brush position has no effect on the commutator grooving

Ans: a

549. The following constitute short-circuit in the armature winding.

(a) Insulation failure between two commutator bars

(b) Insulation failure between two turns of a coil

(c) Two or more turns of the same coil getting grounded

(d) All of the above

Ans: d

550. The rapid wear of brushes takes place due to

(a) abrasion from dust

(b) excessive spring pressure

(c) rough commutator bars

- (d) high mica insulation between commutation bars
- (e) all of the above factors

Ans: e

551. Number of tappings for each equalizer ring is equal to

- (a) number of pole pairs
- (b) number of poles
- (c) number of parallel paths
- (d) number of commutator segments

Ans: a

552. A D.C. generator can be considered as

- (a) rectifier
- (b) primemover
- (c) rotating amplifier
- (d) power pump

Ans: c

553. In any rotating machine that part which houses the conductors and in which e.m.f. induced is to be utilised is called

- (a) rotor
- (b) stator
- (c) field
- (d) armature

Ans: d

554. In a D.C. machine stray loss is the sum of

- (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

Ans: d

555. Lap winding is composed of

- (a) any even number of conductors
- (b) any odd number of conductors
- (c) that even number which is exact multiple of poles + 2
- (d) that even number which is exact multiple of poles

Ans: a

556. In a D.C. generator in case the resistance of the field winding is increased, then output voltage will

- (a) increase
- (b) decrease
- (c) remain unaffected
- (d) fluctuate heavily

Ans: b

557. An exciter for a turbo generator is a

- (a) separately excited generator

- (b) shunt generator
- (c) series generator
- (d) compound generator

Ans: b

558. In case of a flat compounded generator

- (a) voltage generated is less than the rated voltage
- (b) generated voltage is proportional to the load on the generator
- (c) voltage remains constant irrespective of the load
- (d) speed varies in proportion to the load on the generator

Ans: c

559. Which of the following generator will have negligible terminal voltage while running on no-load ?

- (a) Series generator
- (b) Shunt generator
- (c) Compound generator
- (d) Separately excited generator

Ans: a

560. Which of the following D.C. generators will be in a position to build up without any residual magnetism in the poles ?

- (a) Series generator
- (b) Shunt generator
- (c) Compound generator
- (d) None of the above

Ans: d

561. In over compounded generator, full load terminal voltage is

- (a) almost zero
- (b) less than no-load terminal voltage
- (c) more than no-load terminal voltage
- (d) equal to no-load terminal voltage

Ans: c

562. In a level compounded D.C. generator, full load terminal voltage is

- (a) negligibly low
- (b) equal to no-load terminal voltage
- (c) more than no-load terminal voltage
- (d) less than no-load terminal voltage

Ans: b

563. The terminal voltage of a D.C. shunt generator drops on load because of all of the following reasons except

- (a) armature reaction
- (b) armature resistance drop
- (c) field weakening due to armature reaction and armature
- (d) commutation

Ans: d

564. In a D.C. generator

- (a) external resistance = internal characteristic - armature reaction
- (b) internal characteristic = magnetisation characteristic - ohmic drop
- (c) external characteristic = magnetisation characteristic - ohmic drop - armature reaction
- (d) magnetisation characteristic = external characteristic

Ans: c

565. A sinusoidal voltage of 5 Hz is applied to the field of a shunt generator. The armature voltage wave

- (a) will be zero
- (b) will be of 5 Hz
- (c) will be of $5\sqrt{2}$ V Hz
- (d) will be of $\sqrt{2}$ Hz 5

Ans: b

566. A 220 V D.C. generator is run at full speed without any excitation. The open circuit voltage will be

- (a) zero
- (b) about 2 V
- (c) about 50 V
- (d) 220 V

Ans: b

567. In a separately excited generator supplying rated load the armature reaction ,

- (a) is always present
- (b) is always absent
- (c) may be sometimes present
- (d) none of the above

Ans: a

568. If residual magnetism is present in a D.C. generator, the induced e.m.f. at zero speed will be

- (a) zero
- (b) small
- (c) the same as rated voltage
- (d) high

Ans: a

569. Armature reaction in a generator results in

- (a) demagnetisation of leading pole tip and magnetisation of trailing pole tip
- (b) demagnetisation of trailing pole tip and magnetisation of leading pole tip
- (c) demagnetising the centre of all poles
- (d) magnetising the centre of all poles

Ans: a

570. Following energized winding of a D.C. machine should not be opened as it would produce high inductive voltage which may be dangerous to personnel and may cause its own insulation failure.

- (a) Series field
- (b) Compensating field
- (c) Inter pole field
- (d) Shunt field

Ans: d

571. Wave winding is composed of

- (a) any even number of conductors
- (b) any odd number of conductors
- (c) that even number which is exact multiple of poles + 2
- (d) that even number which is exact multiple of poles

Ans: c

572. The critical resistance of the D.C. generator is the resistance of

- (a) field
- (b) brushes
- (c) armature
- (d) load

Ans: a

573. When two D.C. series generators are running in parallel, an equilizer bar is used

- (a) to increase the speed and hence generated e.m.f.
- (b) to increase the series flux
- (c) so that two similar machines will pass approximately equal currents to the load
- (d) to reduce the combined effect of armature reaction of both machines

Ans: c

574. Which of the following generating machine will offer constant voltage on all loads ?

- (a) Self-excited generator
- (b) Separately excited generator
- (c) Level compounded generator .
- (d) All of the above

Ans: c

575. Which of the following generators will be preferred if they are required to be run in parallel ?

- (a) Shunt generators
- (b) Series generators
- (c) Compound generators
- (d) None of the above

Ans: a

576. Two generators are running in parallel. One of the generators may run as motor for which of the following reasons ?

- (a) The direction of that generator is reversed
- (b) The speed of that generator is increased
- (c) The field of that generator is weakened
- (d) That generator takes large share of loads

Ans: d

577. A D.C. generator works on the principle of

- (a) Lenz's law
- (b) Ohm's law
- (c) Faraday's law of electromagnetic induction

(d) none of the above

Ans: c

578. A series generator can self-excite

- (a) only if the load current is zero
- (b) only if the load current is not zero
- (c) irrespective of the value of load current
- (d) none of the above

Ans: b

579. A shunt generator can self-excite

- (a) only if the resistance of the field circuit is less than critical value
- (b) only if the resistance of the field circuit is critical value
- (c) irrespective of the value of the resistance in the field circuit

Ans: a

580. 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

- (a) 150 V
- (b) less than 150 V
- (c) greater than 150 V
- (d) none of the above

Ans: c

581. The open circuit voltage of a compound generator is 250 V. At full load the terminal voltage

- (a) will be less than 250 V
- (b) will always be 250 V
- (c) may be greater or less than 250 V
- (d) none of the above

Ans: c

582. Two D.C. shunt generators, each with armature resistance of 0.02 ohm and field resistance of 50 ohm run in parallel and supply a total current of 1000 amperes to the load circuit. If their e.m.fs. are 270 V and 265 V, their bus bar voltage will be

- (a) 270 V
- (b) 267.5 V
- (c) 265 V
- (d) 257.4 V

Ans: b

583. The essential condition for parallel operation of two D.C. generators is that they have '

- (a) same kW rating
- (b) the same operation r.p.m.
- (c) the same drooping voltage characteristics
- (d) same percentage regulation

Ans: c

584. When two D.C. generators are running in parallel an equalizer bar is used

- (a) to increase the series flux

- (b) to increase the generated e.m.f.
- (c) to reduce the combined effect of armature reaction of both the machines
- (d) so that the two identical machines will pass approximately equal currents to the load

Ans: d

585. With a D.C. generator which of the following regulation is preferred ?

- (a) 100% regulation
- (b) infinite regulation
- (c) 50% regulation
- (d) 1% regulation

Ans: d

586. Which generator would you prefer for feeding long D.C. transmission lines ?

- (a) Series generator
- (b) Shunt generator
- (c) Over compound generator
- (d) Flat compound generator

Ans: c

587. In a D.C. generator the critical resistance can be increased by

- (a) increasing its field resistance
- (b) decreasing its field resistance
- (c) increasing its speed
- (d) decreasing its speed

Ans: c

588. The number of armature parallel paths in a two-pole D.C. generator having duplex lap winding is

- (a) 2
- (b) 4
- (c) 6
- (d) 8

Ans: b

589. For both lap and wave windings, there are as many commutator bars as the number of

- (a) slots
- (b) armature conductors
- (c) winding elements
- (d) poles

Ans: c

590. The series field of a short-shunt D.C. generator is excited by

- (a) external current
- (b) armature current
- (c) shunt current
- (d) load current

Ans: d

591. As a result of armature reaction, the reduction in the total mutual air gap flux in a D.C. generator is approximately

- (a) 40 percent
- (b) 25 percent
- (c) 10 percent
- (d) 5 percent

Ans: d

592. Shunt generators are most suited for stable parallel operation because of their

- (a) rising voltage characteristics
- (b) identical voltage characteristics
- (c) drooping voltage characteristics
- (d) linear voltage characteristics

Ans: c

593. The main factor which leads to unstable parallel operation of flat and over compounded generators is

- (a) their rising voltage characteristics
- (b) unequal number of turns in their series field windings
- (c) unequal speed regulation of their primemovers
- (d) unequal series field resistances

Ans: a

594. If a self excited D.C. generator after being installed, fails to build up on its first trial run, the first is to

- (a) reverse the field connections
- (b) increase the field resistance
- (c) increase the speed of primemover
- (d) check armature insulation resistance

Ans: a

595. No-load speed of which of the following motor will be highest ?

- (a) Shunt motor
- (b) Series motor
- (c) Cumulative compound motor
- (d) Differentiate compound motor

Ans: b

596. The direction of rotation of a D.C. series motor can be changed by

- (a) interchanging supply terminals
- (b) interchanging field terminals
- (c) either of (a) and (b) above
- (d) None of the above

Ans: b

597. Which of the following application requires high starting torque ?

- (a) Lathe machine
- (b) Centrifugal pump
- (c) Locomotive
- (d) blower

Ans: c

598. If a D.C. motor is to be selected for conveyors, which motor would be preferred ?

- (a) Series motor
- (b) Shunt motor
- (c) Differentially compound motor
- (d) Cumulative compound motor

Ans: a

599. Which D.C. motor will be preferred for machine tools ?

- (a) Series motor
- (b) Shunt motor
- (c) Cumulative compound motor
- (d) Differential compound motor

Ans: b

600. Differentially compound D.C. motors can find applications requiring

- (a) high starting torque
- (b) low starting torque
- (c) variable speed
- (d) frequent on-off cycles

Ans: b

601. Which D.C. motor is preferred for elevators ?

- (a) Shunt motor
- (b) Series motor
- (c) Differential compound motor
- (d) Cumulative compound motor

Ans: d

602. According to Fleming's left-hand rule, when the forefinger points in the direction of the field or flux, the middle finger will point in the direction of

- (a) current in the conductor
- (b) direction of conductor
- (c) resultant force on conductor
- (d) none of the above

Ans: a

603. If the field of a D.C. shunt motor gets opened while motor is running

- (a) the speed of motor will be reduced %
- (b) the armature current will reduce
- (c) the motor will attain dangerously high speed
- (d) the motor will continue to run at constant speed

Ans: c

604. Starters are used with D.C. motors because

- (a) these motors have high starting torque
- (b) these motors are not self-starting
- (c) back e.m.f. of these motors is zero initially
- (d) to restrict armature current as there is no back e.m.f. while starting

Ans: d

605. In D.C. shunt motors as load is reduced

- (a) the speed will increase abruptly
- (b) the speed will increase in proportion to reduction in load
- (c) the speed will remain almost/constant
- (d) the speed will reduce

Ans: c

606. A D.C. series motor is that which

- (a) has its field winding consisting of thick wire and less turns
- (b) has a poor torque
- (c) can be started easily without load
- (d) has almost constant speed

Ans: a

607. For starting a D.C. motor a starter is required because

- (a) it the speed of the motor
- (b) it limits the starting current to a safe value
- (c) it starts the motor
- (d) none of the above

Ans: b

608. The type of D.C. motor used for shears and punches is

- (a) shunt motor
- (b) series motor
- (c) differential compoutid D.C. motor
- (d) cumulative compound D.C. motor

Ans: d

609. If a D.C. motor is connected across the A.C. supply it will

- (a) run at normal speed
- (b) not run
- (c) run at lower speed
- (d) burn due to heat produced in the field winding by .eddy currents

Ans: d

610. To get the speed of D.C, motor below the normal without wastage of electrical energy is used.

- (a) Ward Leonard control
- (b) rheostatic control
- (c) any of the above method
- (d) none of the above method

Ans: a

611. When two D.C. series motors are connected in parallel, the resultant speed is

- (a) more than the normal speed
- (b) loss than the normal speed
- (c) normal speed
- (d) zero

Ans: c

612. The speed of a D.C. shunt motor more than its full-load speed can be obtained by

- (a) decreasing the field current
- (b) increasing the field current
- (c) decreasing the armature current
- (d) increasing the armature current

Ans: a

613. In a D.C. shunt motor, speed is

- (a) independent of armature current
- (b) directly proportional to the armature current
- (c) proportional to the square of the current
- (d) inversely proportional to the armature current

Ans: a

614. A direct on line starter is used: for starting motors

- (a) up to 5 H.P.
- (b) up to 10 H.P.
- (c) up to 15 H.P.
- (d) up to 20 H.P.

Ans: a

615. What will happen if the back e.m.f. of a D.C. motor vanishes suddenly?

- (a) The motor will stop
- (b) The motor will continue to run
- (c) The armature may burn
- (d) The motor will run noisy

Ans: c

616. In case of D.C. shunt motors the speed is dependent on back e.m.f. only because

- (a) back e.m.f. is equal to armature drop
- (b) armature drop is negligible
- (c) flux is proportional to armature current
- (d) flux is practically constant in D.C. shunt motors

Ans: d

617. In a D.C. shunt motor, under the conditions of maximum power, the current in the armature will be

- (a) almost negligible
- (b) rated full-load current
- (c) less than full-load current
- (d) more than full-load current

Ans: d

618. These days D.C. motors are widely used in

- (a) pumping sets
- (b) air compressors
- (c) electric traction
- (d) machine shops

Ans: c

619. By looking at which part of the motor, it can be easily confirmed that a particular motor is D.C. motor?

- (a) Frame
- (b) Shaft
- (c) Commutator
- (d) Stator

Ans: c

620. In which of the following applications D.C. series motor is invariably tried?

- (a) Starter for a car
- (b) Drive for a water pump
- (c) Fan motor
- (d) Motor in A.C. or D.C.

Ans: a

621. In D.C. machines fractional pitch winding is used

- (a) to improve cooling
- (b) to reduce copper losses
- (c) to increase the generated e.m.f.
- (d) to reduce the sparking

Ans: d

622. A three point starter is considered suitable for

- (a) shunt motors
- (b) shunt as well as compound motors
- (c) shunt, compound and series motors
- (d) all D.C. motors

Ans: b

623. In case the conditions for maximum power for a D.C. motor are established, the efficiency of the motor will be

- (a) 100%
- (b) around 90%
- (c) anywhere between 75% and 90%
- (d) less than 50%

Ans: d

624. The ratio of starting torque to full-load torque is least in case of

- (a) series motors
- (b) shunt motors
- (c) compound motors
- (d) none of the above

Ans: b

625. In D.C. motor which of the following can sustain the maximum temperature rise?

- (a) Slip rings

- (b) Commutator
- (c) Field winding
- (d) Armature winding

Ans: c

626. Which of the following /rule can be used to determine the direction of rotation of D.C. motor ?

- (a) Lenz's law
- (b) Faraday's law
- (c) Coloumb's law
- (d) Fleming's left-hand rule

Ans: d

627. Which of the following load normally needs starting torque more than the rated torque?

- (a) Blowers
- (b) Conveyors
- (c) Air compressors
- (d) Centrifugal pumps

Ans: b

628. The starting resistance of a D.C. motor is generally

- (a) low
- (b) around 500 Ω
- (c) 1000 Ω
- (d) infinitely large

Ans: a

629. The speed of a D.C. series motor is

- (a) proportional to the armature current
- (b) proportional to the square of the armature current
- (c) proportional to field current
- (d) inversely proportional to the armature current

Ans: d

630. In a D.C. series motor, if the armature current is reduced by 50%, the torque of the motor will be equal

to

- (a) 100% of the previous value
- (b) 50% of the previous value
- (c) 25% of the previous value
- (d) 10% of the previous value
- (e) none of the above

Ans: c

631. The current drawn by the armature of D.C. motor is directly proportional to

- (a) the torque required
- (b) the speed of the motor
- (c) the voltage across the terminals

(d) none of the above

Ans: a

632. The power mentioned on the name plate of an electric motor indicates

- (a) the power drawn in kW
- (b) the power drawn in kVA
- (c) the gross power
- (d) the output power available at the shaft

Ans: d

633. Which D.C. motor has got maximum self loading property?

- (a) Series motor
- (b) Shunt motor
- (c) Cumulatively compounded motor
- (d) Differentially compounded motor

Ans: d

634. Which D.C. motor will be suitable alongwith flywheel for intermittent light and heavy loads?

- (a) Series motor
- (b) Shunt motor
- (c) Cumulatively compounded motor
- (d) Differentially compounded motor

Ans: c

635. If a D.C. shunt motor is working at no load and if shunt field circuit suddenly opens

- (a) nothing will happen to the motor
- (b) this will make armature to take heavy current, possibly burning it
- (c) this will result in excessive speed, possibly destroying armature due to excessive centrifugal stresses
- (d) motor will run at very slow speed

Ans: c

636. D.C. series motors are used

- (a) where load is constant
- (b) where load changes frequently
- (c) where constant operating speed is needed
- (d) in none of the above situations.

Ans: d

637. For the same H.P. rating and full load speed, following motor has poor starting torque

- (a) shunt
- (b) series
- (c) differentially compounded
- (d) cumulatively compounded

Ans: c

638. In case of conductively compensated D.C. series motors, the compensating winding is provided

- (a) as separately wound unit
- (b) in parallel with armature winding
- (c) in series with armature winding

(d) in parallel with field winding

Ans: c

639. Sparking at the commutator of a D.C. motor may result in

- (a) damage to commutator segments
- (b) damage to commutator insulation
- (c) increased power consumption
- (d) all of the above

Ans: d

640. Which of the following motor is preferred for operation in highly explosive atmosphere ?

- (a) Series motor
- (b) Shunt motor
- (c) Air motor
- (d) Battery operated motor

Ans: c

641. If the supply voltage for a D.C. motor is increased, which of the following will decrease ?

- (a) Starting torque
- (b) Operating speed
- (c) Full-load current
- (d) All of the above

Ans: c

642. Which one of the following is not the function of pole shoes in a D.C. machine ?

- (a) To reduce eddy current loss
- (b) To support the field coils
- (c) To spread out flux for better uniformity
- (d) To reduce the reluctance of the magnetic path

Ans: a

643. The mechanical power developed by a shunt motor will be maximum when the ratio of back e.m.f. to applied voltage is

- (a) 4.0
- (b) 2.0
- (c) 1.0
- (d) 0.5

Ans: d

644. The condition for maximum power in case of D.C. motor is

- (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.

Ans: b

645. For which of the following applications a D.C. motor is preferred over an A.C. motor ?

- (a) Low speed operation
- (b) High speed operation

- (c) Variable speed operation
- (d) Fixed speed operation

Ans: c

646. In D.C. machines the residual magnetism is of the order of

- (a) 2 to 3 per cent
- (b) 10 to 15 per cent
- (c) 20 to 25 per cent
- (d) 50 to 75 per cent

Ans: a

647. Which D.C. motor is generally preferred for cranes and hoists ?

- (a) Series motor
- (b) Shunt motor
- (c) Cumulatively compounded motor
- (d) Differentially compounded motor

Ans: a

648. Three point starter can be used for

- (a) series motor only
- (b) shunt motor only
- (c) compound motor only
- (d) both shunt and compound motor

Ans: d

649. Sparking, is discouraged in a D.C. motor because

- (a) it increases the input power consumption
- (b) commutator gets damaged
- (c) both (a) and (b)
- (d) none of the above

Ans: b

650. Speed control by Ward Leonard method gives uniform speed variation

- (a) in one direction
- (b) in both directions
- (c) below normal speed only
- (d) above normal speed only.

Ans: b

651. Flywheel is used with D.C. compound motor to reduce the peak demand by the motor, compound motor will have

to be

- (a) level compounded
- (b) under compounded
- (c) cumulatively compounded
- (d) differentially compounded

Ans: c

652. Following motor is used where high starting torque and wide speed range control is required.

- (a) Single phase capacitor start
- (b) Induction motor
- (c) Synchronous motor
- (d) D.C. motor
- (e) None of the above

Ans: d

653. In a differentially compounded D.C. motor, if shunt field suddenly opens

- (a) the motor will first stop and then run in opposite direction as series motor
- (b) the motor will work as series motor and run at slow speed in the same direction
- (c) the motor will work as series motor and run at high speed in the same direction
- (d) the motor will not work and come to stop

Ans: a

654. Which of the following motor has the poorest speed regulation ?

- (a) Shunt motor
- (b) Series motor
- (c) Differential compound motor
- (d) Cumulative compound motor

Ans: b

655. Buses, trains, trolleys, hoists, cranes require high starting torque and therefore make use of

- (a) D.C. series motor
- (b) D.C. shunt motor
- (c) induction motor
- (d) all of above motors

Ans: a

656. As the load is increased the speed of D.C. shunt motor will

- (a) reduce slightly
- (b) increase slightly
- (c) increase proportionately
- (d) remains unchanged

Ans: a

657. The armature torque of the D.C. shunt motor is proportional to

- (a) field flux only
- (b) armature current only
- (c) both (a) and (b)
- (d) none of the above

Ans: b

658. Which of the following method of speed control of D.C. machine will offer minimum efficiency ?

- (a) Voltage control method
- (b) Field control method
- (c) Armature control method
- (d) All above methods

Ans: c

659. Usually wide and sensitive speed control is desired in case of

- (a) centrifugal pumps
- (b) elevators
- (c) steel rolling mills
- (d) colliery winders

Ans: d

660. The speed of a motor falls from 1100 r.p.m. at no-load to 1050 r.p.m. at rated load. The speed regulation of the motor is

- (a) 2.36%
- (b) 4.76%
- (c) 6.77%
- (d) 8.84%

Ans: b

661. The armature voltage control of D.C. motor provides

- (a) constant torque drive
- (b) constant voltage drive
- (c) constant current drive
- (d) none of the above

Ans: a

662. As there is no back e.m.f. at the instant of starting a D.C. motor, in order to prevent a heavy current from flowing through the armature circuit

- (a) a resistance is connected in series with armature
- (b) a resistance is connected parallel to the armature
- (c) armature is temporarily open circuited
- (d) a high value resistor is connected across the field winding

Ans: a

663. The speed of a D.C. shunt motor can be increased by

- (a) increasing the resistance in armature circuit
- (b) increasing the resistance in field circuit
- (c) reducing the resistance in the field circuit
- (d) reducing the resistance in the armature circuit

Ans: b

664. If I_2 be the armature current, then speed of a D.C. shunt motor is

- (a) independent of I_a
- (b) proportional to I_a
- (c) varies as (I_a)
- (d) varies as I_a

Ans: a

665. In case the back e.m.f. and the speed of a D.C. motor are doubled, the torque developed by the motor will

- (a) remain unchanged
- (b) reduce to one-fourth value

- (c) increase four folds
- (d) be doubled

Ans: a

666. At the instant of starting when a D.C. motor is put on supply, it behaves like

- (a) a highly resistive circuit
- (b) a low resistance circuit
- (c) a capacitive circuit
- (d) none of the above

Ans: b

667. The speed of a D.C. motor can be varied by varying

- (a) field current
- (b) applied voltage
- (c) resistance in series with armature
- (d) any of the above

Ans: d

668. Which one of the following is not necessarily the advantage of D.C. motors over A.C. motors ?

- (a) Low cost
- (b) Wide speed range
- (c) Stability
- (d) High starting torque.

Ans: a

669. For a D.C. shunt motor if the excitation is changed

- (a) torque will remain constant
- (b) torque will change but power will remain constant
- (c) torque and power both will change
- (d) torque, power and speed, all will change

Ans: b

670. Which motor has the poorest speed control?

- (a) Differentially compounded motor
- (b) Cumulatively compounded motor
- (c) Shunt motor
- (d) Series motor

Ans: d

671. The plugging gives the

- (a) zero torque braking
- (b) smallest torque braking
- (c) highest torque braking
- (d) none of the above

Ans: c

672. The armature voltage control of D.C. motor provides

- (a) constant voltage drive
- (b) constant current drive

- (c) constant torque drive
- (d) none of the above

Ans: c

673. If a D.C. motor designed for 40°C ambient temperature is to be used for 50°C ambient temperature, then the motor

- (a) of lower H.P. should be selected
- (b) of higher H.P. should be selected
- (c) can be used for 50°C ambient temperature also
- (d) is to be derated by a factor recommended by manufacturer and select the next higher H.P. motor

Ans: d

674. If the terminals of armature of D.C. motor are interchanged, this action will offer following kind of braking

- (a) regenerative
- (b) plugging
- (c) dynamic braking
- (d) none of the above
- (e) any of the above

Ans: b

675. Which of the following motors one will choose to drive the rotary compressor ?

- (a) D.C. shunt motor
- (b) D.C. series motor
- (c) Universal motor
- (d) Synchronous motor

Ans: d

676. If the speed of a D.C. shunt motor is increased, the back e.m.f. of the motor will

- (a) increase
- (b) decrease
- (c) remain same
- (d) become zero

Ans: a

677. Why are the D.C. motors preferred for traction applications ?

- (a) Torque and speed are inversely proportional to armature current
- (b) Torque is proportional to armature current
- (c) Torque is proportional to square root of armature current
- (d) The speed is inversely proportional to the torque and the torque is proportional to square of armature current

Ans: d

678. Which of the following motors is usually used in house-hold refrigerators ?

- (a) D.C. shunt motor
- (b) D.C. series motor
- (c) Single phase induction motor (split phase start or induction run motor)
- (d) Reluctance motor

(e) Synchronous motor

Ans: c

679. Which of the following motors is most suitable for signalling and many kinds of timers ?

- (a) D.C. shunt motor
- (b) D.C. series motor
- (c) Induction motor
- (d) Reluctance motor

Ans: d

680. Which motor should not be started on no-load ?

- (a) Series motor
- (b) Shunt motor
- (c) Cumulatively compounded motor
- (d) Differentially compounded motor.

Ans: a

681. Ward-Leonard control is basically a

- (a) voltage control method
- (b) field divertor method
- (c) field control method
- (d) armature resistance control method

Ans: a

682. For constant torque drive which speed control method is preferred ?

- (a) Field control
- (b) Armature voltage control
- (c) Shunt armature control
- (d) Mechanical loading system

Ans: b

683. In Ward-Leonard control the lower limit of speed is imposed by

- (a) residual magnetism of the generator
- (b) core losses of motor
- (c) mechanical losses of motor and generator together
- (d) all of the above

Ans: a

684. The main disadvantage of the Ward-Leonard control method is

- (a) high initial cost
- (b) high maintenance cost
- (c) low efficiency at high loads
- (d) all of the above

Ans: d

685. Regenerative method of braking is based on that

- (a) back e.m.f. is less than the applied voltage
- (b) back e.m.f. is equal to the applied voltage
- (c) back e.m.f. of rotor is more than the applied voltage

(d) none of the above

Ans: b

686. The hysteresis loss in a D.C. machine least depends on

- (a) Frequency of magnetic reversals
- (b) Maximum value of flux density
- (c) Volume and grade of iron
- (d) Rate of flow of ventilating air

Ans: d

687. In a D.C. generator all of the following could be the effects of iron losses except

- (a) Loss of efficiency
- (b) Excessive heating of core
- (c) Increase in terminal voltage
- (d) Rise in temperature of ventilating air

Ans: c

688. The losses occurring in a D.C. generator are given below. Which loss is likely to have highest proportion at rated load of the generator ?

- (a) hysteresis loss
- (b) field copper loss
- (c) armature copper loss
- (d) eddy current loss

Ans: c

689. Which of the following loss in a D.C. generator varies significantly with the load current ?

- (a) Field copper loss
- (b) Windage loss
- (c) Armature copper loss
- (d) None of the above

Ans: c

690. Torque developed by a D.C. motor depends upon

- (a) magnetic field
- (b) active length of the conductor
- (c) current flow through the conductors
- (d) number of conductors
- (e) radius of armature
- (f) all above factors

Ans: f

691. D.C. shunt motors are used for driving

- (a) trains
- (b) cranes
- (c) hoists
- (d) machine tools

Ans: d

692. In a manual shunt motor starter

- (a) over load is connected in series and no volt relay in parallel with the load
- (b) over load relay is connected in parallel and no volt relay in series with the load
- (c) over load relay and no volt relay are both connected in series with the load
- (d) over load relay and no volt relay are both connected in parallel with the load

Ans: a

693. Which of the following steps is likely to result in reduction of hysteresis loss in a D.C. generator ?

- (a) Providing laminations in armature core
- (b) Providing laminations in stator
- (c) Using non-magnetic material for frame
- (d) Using material of low hysteresis co-efficient for armature core material

Ans: d

694. Which of the following loss in a D.C. generator is dissipated in the form of heat?

- (a) Mechanical loss
- (b) Core loss
- (c) Copper loss
- (d) All of the above

Ans: d

695. Which of the following losses are significantly reduced by laminating the core of a D.C. generator ?

- (a) Hysteresis losses
- (b) Eddy current losses
- (c) Copper losses
- (d) Windage losses

Ans: b

696. The total losses in a well designed D.C. generator of 10 kW will be nearly

- (a) 100 W
- (b) 500 W
- (c) 1000 W
- (d) 1500 W

Ans: b

697. The condition for maximum efficiency for a D.C. generator is

- (a) eddy current losses = stray losses
- (b) hysteresis losses = eddy current losses
- (c) copper losses = 0
- (d) variable losses = constant losses

Ans: d

698. D.C. generators are normally designed for maximum efficiency around

- (a) full-load
- (b) rated r.p.m.
- (c) rated voltage
- (d) all of the above

Ans: a

699. In a D.C. generator, the iron losses mainly take place in

- (a) yoke
- (b) commutator
- (c) armature conductors
- (d) armature rotor

Ans: d

700. D.C. generators are installed near the load centres to reduce

- (a) iron losses
- (b) line losses
- (c) sparking
- (d) corona losses

Ans: b

701. The purpose of retardation test on D.C. shunt machines is to find out

- (a) stray losses
- (b) eddy current losses
- (c) field copper losses
- (d) windage losses

Ans: a

702. Which of the following tests will be suitable for testing two similar D.C. series motors of large capacity ?

- (a) Swinburne's test
- (b) Hopkinson's test
- (c) Field test
- (d) Brake test

Ans: c

703. Hopkinson's test on D.C. machines is conducted at

- (a) no-load
- (b) part load
- (c) full-load
- (d) overload

Ans: c

704. During rheostat braking of D.C. series motors

- (a) motor is run as a generator
- (b) motor is reversed in direction
- (c) motor is run at reduced speed

Ans: a

705. For which types of D.C. motor, dynamic braking is generally used ?

- (a) Shunt motors
- (b) Series motors
- (c) Compound motors
- (d) All of the above

Ans: d

706. Which method of braking is generally used in elevators ?

- (a) Plugging
- (b) Regenerative braking
- (c) Rheostatic braking
- (d) None of the above

Ans: a

707. In variable speed motor

- (a) a stronger commutating field is needed at low speed than at high speed
- (b) a weaker commutating field is needed at low speed than at high speed
- (c) same commutating field is needed at low speed than at high speed
- (d) none of the above is correct

Ans: b

708. When the armature of a D.C. motor rotates, e.m.f. induced is

- (a) self-induced e.m.f.
- (b) mutually induced e.m.f.
- (c) back e.m.f.
- (d) none of the above

Ans: c

709. Where D.C. motor of H.P. 12 or more requires frequent starting, stopping, reversing and speed control

- (a) drum type controller is used
- (b) three point starter is used
- (c) four point starter is used
- (d) all above can be used

Ans: a

710. If a D.C. shunt motor is working at full load and if shunt field circuit suddenly opens

- (a) this will make armature to take heavy current, possibly burning it
- (b) this will result in excessive speed, possibly destroying armature due to excessive centrifugal stresses
- (c) nothing will happen to motor
- (d) motor will come to stop

Ans: a

711. D.C. motor is to drive a load which has certain minimum value for most of the time and some peak value for short duration. We will select the

- (a) series motor
- (b) shunt motor
- (c) compound motor
- (d) any of the above

Ans: a

712. D.C. motor is to drive a load which is almost nil for certain part of the load cycle and peak value for short duration. We will select this

- (a) series motor
- (b) shunt motor
- (c) compound motor
- (d) any of the above

Ans: c

713. Which D.C. motor has got maximum self relieving property ?

- (a) Series motor
- (b) Shunt motor
- (c) Cumulatively compounded motor
- (d) Differentially compounded motor

Ans: a

714. In the D.C. motor the iron losses occur in

- (a) the field
- (b) the armature
- (c) the brushes
- (d) the commutator

Ans: b

715. The speed of a D.C. shunt motor is required to be more than full load speed. This is possible by

- (a) reducing the field current
- (b) decreasing the armature current
- (c) increasing the armature current
- (d) increasing the excitation current
- (e) none of the above methods

Ans: a

716. One D.C. motor another D.C. motor. The second D.C. motor when excited and driven

- (a) runs as a generator
- (b) does not run as a generator
- (c) also runs as a motor comes to stop after sometime

Ans: a

717. The insulating material for a

- | | |
|------------------------------|------------------------------|
| (a) low cost | (b) high dielectric strength |
| (c) high mechanical strength | (d) all of the above |

Ans: d

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

- (a) Bedding
- (b) Sheath
- (c) Armouring
- (d) None of the above

Ans: c

719. Which of the following insulation is used in cables ?

- (a) Varnished cambric
- (b) Rubber

- (c) Paper
- (d) Any of the above

Ans: d

720. Empire tape is

- (a) varnished cambric
- (b) vulcanised rubber
- (c) impregnated paper
- (d) none of the above

Ans: a

721. The thickness of the layer of insulation on the conductor, in cables, depends upon

- (a) reactive power
- (b) power factor
- (c) voltage
- (d) current carrying capacity

Ans: c

722. The bedding on a cable consists of

- (a) hessian
- (b)
- (c) any of the above
- (d) none of the above

Ans: c

723. The insulating material for cables should

- (a) be acid proof
- (b) be non-inflammable
- (c) be non-hygroscopic
- (d) have all above properties

Ans: d

724. In a cable immediately above metallic sheath _____ is provided.

- (a) earthing connection
- (b) bedding
- (c) armouring
- (d) none of the above

Ans: b

725. The current carrying capacity of cables in D.C. is more than that in A.C. mainly due to

- (a) absence of harmonics
- (b) non-existence of any stability limit
- (c) smaller dielectric loss
- (d) absence of ripples
- (e) none of the above

Ans: c

726. In case of three core flexible cable the colour of the neutral is

- (a) blue
- (b) black
- (c) brown
- (d) none of the above

Ans: a

727. cables are used for 132 kV lines.

- (a) High tension
- (b) Super tension
- (c) Extra high tension
- (d) Extra super voltage

Ans: d

728. Conduit pipes are normally used to protect _____ cables.

- (a) unsheathed cables
- (b) armoured
- (c) PVC sheathed cables
- (d) all of the above

Ans: a

729. The minimum dielectric stress in a cable is at

- (a) armour
- (b) bedding
- (c) conductor surface
- (d) lead sheath

Ans: d

730. In single core cables armouring is not done to

- (a) avoid excessive sheath losses
- (b) make it flexible
- (c) either of the above
- (d) none of the above

Ans: a

731. Dielectric strength of rubber is around

- (a) 5 kV/mm
- (b) 15 kV/mm
- (c) 30 kV/mm
- (d) 200 kV/mm

Ans: c

732. Low tension cables are generally used upto

- (a) 200 V
- (b) 500 V
- (c) 700 V
- (d) 1000 V

Ans: d

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

- (a) insulation layer
- (b) sheath
- (c) armour
- (d) conductor surface

Ans: d

734. High tension cables are generally used upto

- (a) 11kV

- (b) 33kV
- (c) 66 kV
- (d) 132 kV

Ans: a

735. The surge resistance of cable is

- (a) 5 ohms
- (b) 20 ohms
- (c) 50 ohms
- (d) 100 ohms

Ans: c

736. PVC stands for

- (a) polyvinyl chloride
- (b) post varnish conductor
- (c) pressed and varnished cloth
- (d) positive voltage conductor
- (e) none of the above

Ans: a737. In the cables, the location of fault is usually found out by comparing

- (a) the resistance of the conductor
- (b) the inductance of conductors
- (c) the capacitances of insulated conductors
- (d) all above parameters

Ans: c

738. In capacitance grading of cables we use a _____ dielectric.

- (a) composite
- (b) porous
- (c) homogeneous
- (d) hygroscopic

Ans: a

739. Pressure cables are generally not used beyond

- (a) 11 kV
- (b) 33 kV
- (c) 66 kV
- (d) 132 kV

Ans: c

740. The material for armouring on cable is usually

- (a) steel tape
- (b) galvanised steel wire
- (c) any of the above
- (d) none of the above

Ans: c

741. Cables, generally used beyond 66 kV are

- (a) oil
- (b) S.L. type
- (c) belted
- (d) armoured

Ans: a

742. The relative permittivity of rubber is

- (a) between 2 and 3
- (b) between 5 and 6
- (c) between 8 and 10
- (d) between 12 and 14

Ans: a

743. Solid type cables are considered unreliable beyond 66 kV because

- (a) insulation may melt due to higher temperature
- (b) skin effect dominates on the conductor
- (c) of corona loss between conductor and sheath material
- (d) there is a danger of breakdown of insulation due to the presence of voids

Ans: d

744. If the length of a cable is doubled, its capacitance

- (a) becomes one-fourth
- (b) becomes one-half
- (c) becomes double
- (d) remains unchanged

Ans: c

745. In cables the charging current

- (a) lags the voltage by 90°
- (b) leads the voltage by 90°
- (c) lags the voltage by 180°
- (d) leads the voltage by 180°

Ans: b

746. A certain cable has an insulation of relative permittivity 4. If the insulation is replaced by one of relative permittivity 2, the capacitance of the cable will become

- (a) one half
- (b) double
- (c) four times
- (d) none of the above

Ans: a

747. If a cable of homogeneous insulation has a maximum stress of 10 kV/mm, then the dielectric strength of insulation should be

- (a) 5 kV/mm
- (b) 10 kV/mm
- (c) 15 kV/mm
- (d) 30 kV/mm

Ans: b

748. In the cables, sheaths are used to

- (a) prevent them from entering the cable
- (b) provide enough strength
- (c) provide proper insulation
- (d) none of the above

Ans: a

749. The intersheaths in the cables are used to

- (a) minimize the stress
- (b) avoid the requirement of good insulation
- (c) provide proper stress distribution
- (d) none of the above

Ans: c

750. The electrostatic stress in underground cables is

- (a) same at the conductor and the sheath
- (b) minimum at the conductor and maximum at the sheath
- (c) maximum at the conductor and minimum at the sheath
- (d) zero at the conductor as well as on the sheath
- (e) none of the above

Ans: c

751. The breakdown of insulation of the cable can be avoided economically by the use of

- (a) inter-sheaths
- (b) insulating materials with different dielectric constants
- (c) both (a) and (b)
- (d) none of the above

Ans: c

752. The insulation of the cable decreases with

- (a) the increase in length of the insulation
- (b) the decrease in the length of the insulation
- (c) either (a) or (b)
- (d) none of the above

Ans: a

753. A cable carrying alternating current has

- (a) hysteresis losses only
- (b) hysteresis and leakage losses only
- (c) hysteresis, leakage and copper losses only
- (d) hysteresis, leakage, copper and friction losses

Ans: b

754. In a cable the voltage stress is maximum at

- (a) sheath
- (b) insulator
- (c) surface of the conductor
- (d) core of the conductor

Ans: d

755. Capacitance grading of cable implies

- (a) use of dielectrics of different permeabilities
- (b) grading according to capacitance of cables per km length
- (c) cables using single dielectric in different concentrations
- (d) capacitance required to be introduced at different lengths to counter the effect of inductance
- (e) none of the above

Ans: a

756. Underground cables are laid at sufficient depth

- (a) to minimise temperature stresses
- (b) to avoid being unearthed easily due to removal of soil
- (c) to minimise the effect of shocks and vibrations due to gassing vehicles, etc.
- (d) for all of the above reasons

Ans: c

757. The advantage of cables over overhead transmission lines is

- (a) easy maintenance
- (b) low cost
- (c) can be used in congested areas
- (d) can be used in high voltage circuits

Ans: c

758. The thickness of metallic shielding on cables is usually

- (a) 0.04 mm
- (b) 0.2 to 0.4 mm
- (e) 3 to 5 mm
- (d) 40 to 60 mm

Ans: a

759. Cables for 220 kV lines are invariably

- (a) mica insulated
- (b) paper insulated
- (c) compressed oil or compressed gas insulated
- (d) rubber insulated
- (e) none of the above

Ans: c

760. Is a cable is to be designed for use on 1000 kV, which insulation would you prefer ?

- (a) Polyvinyl chloride (b) Vulcanised rubber (c) Impregnated paper
- (d) Compressed SFe gas(e) none of the above

Ans: d

761. If a power cable and a communication cable are to run parallel the minimum distance between the two, to avoid interference, should be

- (a) 2 cm
- (b) 10 cm
- (c) 50 cm
- (d) 400 cm

Ans: c

762. Copper as conductor for cables is used as

- (a) annealed
- (b) hardened and tempered
- (c) hard drawn
- (d) alloy with chromium

Ans: a

763. The insulating material should have

- (a) low permittivity
- (b) high resistivity
- (c) high dielectric strength
- (d) all of the above

Ans: d

764. The advantage of oil filled cables is

- (a) more perfect impregnation
- (b) smaller overall size
- (c) no ionisation, oxidation and formation of voids
- (d) all of the above

Ans: d

765. The disadvantage with paper as insulating material is

- (a) it is hygroscopic
- (b) it has high capacitance
- (c) it is an organic material
- (d) none of the above

Ans: a

766. The breakdown voltage of a cable depends on

- (a) presence of moisture
- (b) working temperature
- (c) time of application of the voltage
- (d) all of the above

Ans: d

767. It is difficult to maintain oil filled cables.

- (a) Yes
- (b) No

Ans: a

768. In capacitance grading a homogeneous dielectric is used.

- (a) Yes
- (b) No

Ans: b

769. In congested areas where excavation is expensive and inconvenient 'draw in system' of laying of underground cables is often adopted.

- (a) Yes
- (b) No

Ans: a

770. Natural rubber is obtained from milky sap of tropical trees.

- (a) Yes
- (b) No

Ans: a

