Current Electricity TEST 1

12th Standard

Physics

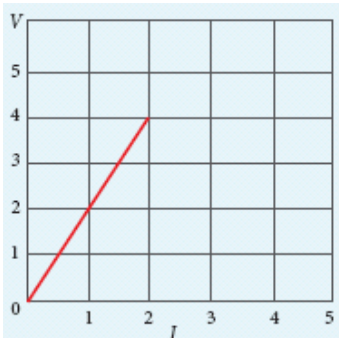Time : 02:30:00 Hrs

Total Marks : 150

Multiple Choice Question

1) Th e following graph shows current versus voltage values of some unknown conductor. What is the resistance of this conductor?

(a) 2 ohm(b) 4 ohm(c) 8 ohm(d) 1 ohm

2) A wire of resistance 2 ohms per meter is bent to form a circle of radius 1m. Th e equivalent resistance between its two diametrically opposite points, A and B as shown in the fi gure is

(a) $\pi\Omega$ **(b)** $\frac{\pi}{2}\Omega$(c) $2\pi\Omega$(d) $\frac{\pi}{4}\Omega$

3) A toaster operating at 240 V has a resistance of 120 Ω. Th e power is
(a) 400 W(b) 2 W**(c) 480 W**(d) 240 W

4) A carbon resistor of (47 ± 4.7) k Ω to be marked with rings of diff erent colours for its identifi cation. Th e colour code sequence will be
(a) Yellow – Green **(b) Yellow – Violet –** (c) Violet – Yellow – (d) Green – Orange
– Violet – Gold **Orange – Silver** Orange – Silver – Violet - Gold

5) What is the value of resistance of the following resistor?

(a) 100 k Ω(b) 10 k Ω(c) 1k Ω(d) 1000 k Ω

6) Two wires of A and B with circular cross section made up of the same material with equal lengths. Suppose R_A = 3 R_B, then what is the ratio of radius of wire A to that of B?

(a) 3 (b) $\sqrt{3}$ **(c)** $\frac{1}{\sqrt{3}}$ (d) $\frac{1}{3}$

7) A wire connected to a power supply of 230 V has power dissipation P_1. Suppose the wire is cut into two equal pieces and connected parallel to the same power supply. In this case power dissipation is P_2. The ratio $\frac{P_2}{P_1}$ is

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

8) In India electricity is supplied for domestic use at 220 V. It is supplied at 110 V in USA. If the resistance of a 60W bulb for use in India is R, the resistance of a 60W bulb for use in USA will be

(a) R (b) 2R **(c)** $\frac{R}{4}$ (d) $\frac{R}{2}$

9) In a large building, there are 15 bulbs of 40W, 5 bulbs of 100W, 5 fans of 80W and 1 heater of 1kW are connected. The voltage of electric mains is 220V. The minimum capacity of the main fuse of the building will be
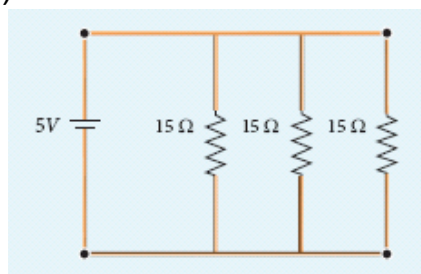
(a) 14 A (b) 8 A (c) 10 A **(d) 12 A**

10) There is a current of 1.0 A in the circuit shown below. What is the resistance of P ?

(a) 1.5 Ω (b) 2.5 Ω **(c) 3.5 Ω** (d) 4.5 Ω
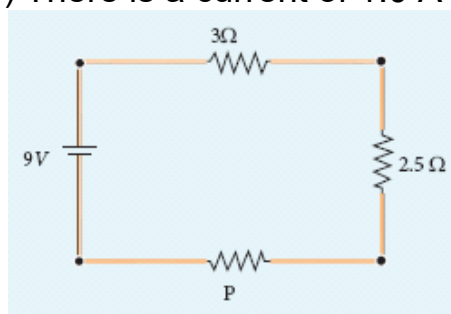
11) What is the current out of the battery?

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

12) The temperature coefficient of resistance of a wire is 0.00125 per °C. At 300 K, its resistance is 1 Ω. The resistance of the wire will be 2 Ω at

(a) 1154 K (b) 1100 K (c) 1400 K **(d) 1127 K**

13) The internal resistance of a 2.1 V cell which gives a current of 0.2 A through a resistance of 10 Ω is

(a) 0.2 Ω **(b) 0.5 Ω** (c) 0.8 Ω (d) 1.0 Ω

14) A piece of copper and another of germanium are cooled from room temperature to 80 K. The resistance of

(a) each of them increases   (b) each of them decreases   (c) copper increases and germanium decreases   **(d) copper decreases and germanium increases**

15) In Joule's heating law, when I and t are constant, if the H is taken along the y axis and I2 along the x axis, the graph is

(a) straight line (b) parabola (c) circle (d) ellipse

16) The colour code on a carbon resistor is red - red - black. The resistance of the resistor is?

(a) 2.2Ω **(b)** 22Ω (c) 220 2.2Ω (d) $2.2k\Omega$

17) The electrical resistivity of a thin copper wire and a thick copper wire are respectively $P_1\Omega$ m and $P_2\Omega$ m Then.

(a) $P_1 > P_2$ (b) $P_2 > P_1$ **(c)** $P_1 = P_2$ (d) $\dfrac{P_1}{P_2}$

18) When 'n' resistors of equal resistance (R) are connected in series and in parallel respectively,then the ratio of their effective resistance is
(a) $1: n^2$ **(b)** $n^2: 1$ (c) n: 1 (d) 1: n

19) Which of the following has negative temperature coefficient of resistance?
(a) copper (b) tungsten **(c) carbon** (d) silver

20) The temperature co-efficient of resistance for alloys is
(a) low (b) very low (c) high (d) very high

21) Which of the following material has the highest specific resistance?
(a) rubber (b) silver (c) germanium (d) glass

22) Temperature co-effieient of resistance for metals is
(a) constant **(b) positive** (c) zero (d) negative

23) An electron gun in a TV shoots out a beam of electrons. The obeam current is lOll A. The charge that strikes the screen in I minute is
(a) $+600\mu C$ **(b)** $-600\mu C$ (c) $+10\mu C$ (d) $-10\mu C$

24) If the specific resistance of a potentiometer wire is 10^{-7} Om and current flowing through it . is 0.1 amp, cross - sectional area of wire is 10^{-6} m^2, then potential gradient will be
(a) 10^{-2} v/m (b) 10^{-4} v/m (c) 10^{-6} v/m (d) 10^{-8} v/m

25) A metallic block has no potential difference applied across it, then the mean velocity of free electrons is
(a) proportional to T (b) proportional for $\sqrt{T}$ (c) finite but independent of temperature **(d) zero**

26) In an electrical arrangement as shown the equivalent resistance between X and Y will be

(a) 158.75Ω **(b)** 118.75Ω (c) 218.75Ω (d) 318.75Ω
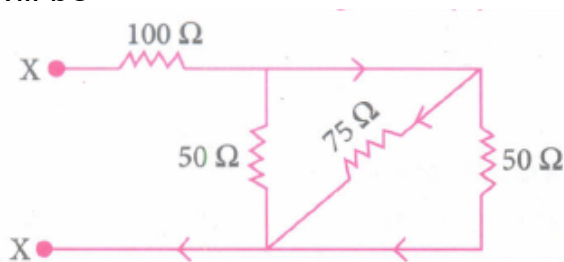
27) The emf of a battery is 3 volts and internal resistance 0.125 Ω . The difference of potential
at the terminal of battery when connected across an external resistance of 1 Ω is
(a) 1.67 V (b) 0.67 V **(c) 2.67 V** (d) 3.67 V

28) A square aluminum rod is 1 m long and 5 mm on edge. What must be the radius of another aluminum rod whose length is 1 m and which has the same resistance as that of square Aluminum rod?
(a) 1.4 mm **(b) 2.8 mm** (c) 4.2 mm (d) 5.6 mm

29) Four resistances are connected to a 5V battery of negligible internal resistance as shown what is the potential across 2Ω?
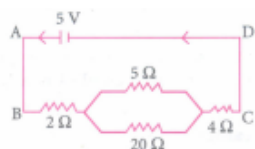
(a) 0.5 V(b) 1:5 V**(c) 1.0 V**(d) 1.0 V

30) An unknown resistance is connected in parallel with a 15Ω resistance and a 12V battery. What is the value of the unknown resistance if the current in the circuit is 2A?

(a) 10Ω(b) 20Ω(c) 30Ω(d) 40Ω

31) Five 3 resistances are arranged in a polygon (5 sides). What is the resistance between any two corners?

(a) 2.4Ω(b) 3Ω(c) 9Ω(d) 5Ω

32) How many 160 Ω resistor in parallel are required to carry a current of 5 A on a 100 V line?

(a) 2(b) 4(c) 6**(d) 8**

33) The potential difference across the terminals of a cell varies with the current drown from

the cell according to the graph.

(a)   (b)   (c)   (d)
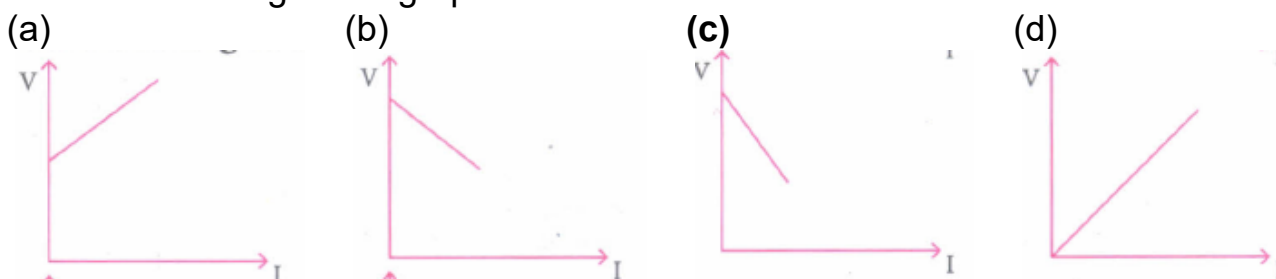
34) In an experiment with potentiometer when the galvanometer deflection is zero, then no current flows in

(a) the wire of potentiometer   (b) the primary circuit   **(c) the galvanometer circuit**   (d) accumulator cell

35) Kirchoff's I law i.e, $\Sigma i = 0$ at a junction, deals with the conservation of

(a) charge(b) energy(c) momentum(d) angular momentum

36) The potential gradient of the potentiometer wire depends on

(a) only on the current that flows   (b) only on the resistance per unit length of the wire   **(c) both the above mentioned**   (d) none ofthe above

37) The current in the given circyit is
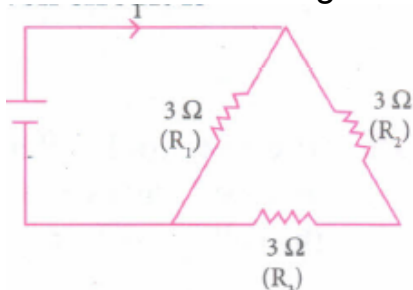
(a) $\dfrac{1}{8}A$(b) $\dfrac{2}{9}A$(c) $\dfrac{2}{9}A$**(d) $1A$**

38) A potential difference is applied an the ends of a metallic wire. If the potential difference is doubled, the drift velocity

(a) will be doubled   (b) will be halved   (c) will be quadrupled   (d) will remain unchanged

39) Resistance between the points A and B in the given figure is

(a) 9Ω(b) 2Ω **(c)** 3Ω(d) 6Ω

40) Resistance increases with increases in temperature for

(a) conductor(b) semiconductors(c) insulators(d) superconductor

41) Which of the following is an identical.

(a) germanium, silicon(b) silver, wood(c) aluminum, constantan(d) bakelite, iron

42) A bird sitting on an insulated wire carrying a current feels quite safe because

(a) the bird is a non-conductor of electricity	(b) resistance of the bird is very large	(c) there is a large potential difference between bird and wire	**(d) there is no potential difference between bird and wire**

43) Conductor which obey ohm's law are called.

(a) dielectrics(b) superconductors**(c) ohmic conductors**(d) semiconductors

44) conductivity is the reciprocal of

(a) resistance**(b) specific resistance**(c) conductance(d) potential difference

45) Electrical resistance is given by

(a) $R = \dfrac{Al}{\sigma}$ **(b)** $R = \dfrac{l}{\sigma A}$ (c) $R = \dfrac{\sigma A}{l}$ (d) $R = \dfrac{\sigma}{Al}$

46) Peltier effect is the converse of

(a) Joule effect(b) Raman effect(c) Thomson effect**(d) Seebeck effect**

47) Nichrome wire is used as the heating element because it has

(a) low specific resistance	(b) low melting point	**(c) high specific resistance**	(d) high specific resistance

48) An ideal cell is connected to a capacitor through a voltmeter. The reading V of the voltmeter is plotted against time. Which of the following best represents the resulting curve?
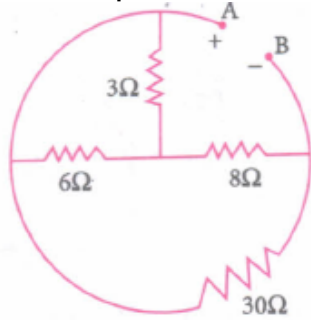
(a) (b) (c) (d)
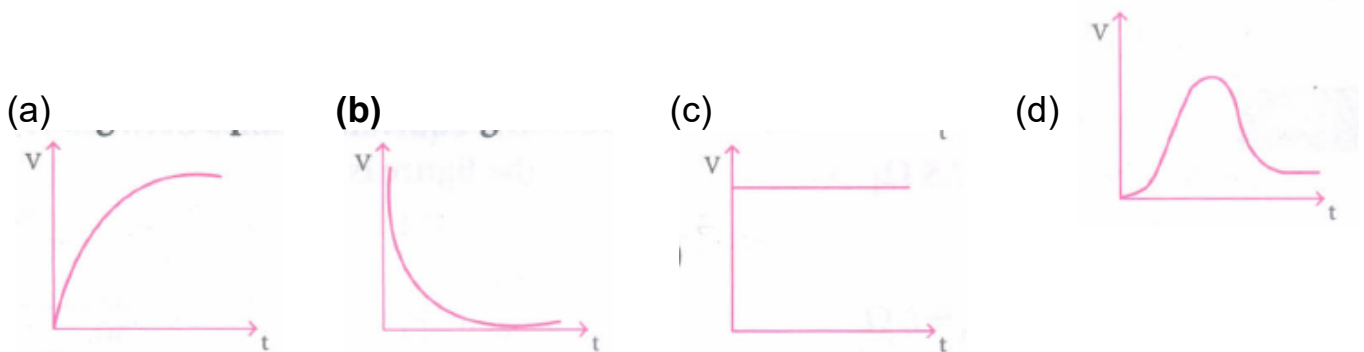
49) The value of current I in the network as shown is
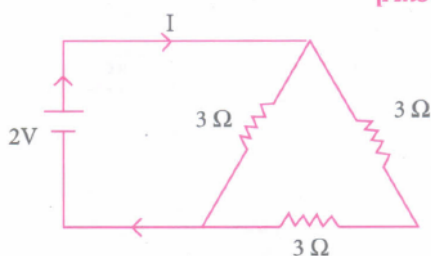
(a) $\dfrac{1}{9}A$(b) $\dfrac{1}{9}A$(c) $\dfrac{3}{9}A$**(d) 1A**

50) The equivalent resistance between A and B in the figure is

(a) 15Ω **(b)** 7.5Ω (c) 25Ω (d) 30Ω

51) The heating element that does not oxidize readily is an alloy of metals made of

(a) Nickel and Iron   **(b) Nickel and Chromium**   (c) copper and Manganin   (d) Nickel and Copper

52) Which of the following is not related to joule's law of heating?

(a) $H = VIt$ (b) $H = I^2Rt$ (c) $H = \dfrac{V^2t}{R}$ **(d)** $H = \dfrac{I^2R}{t}$

53) Fuse wire is an alloy of

(a) 37 % lead and 63 % tin   (b) 63 % lead and 37 % tin   (c) 37 % copper and 63 % tin   (d) 63 % copper and 37 % tin

54) In an electric circuit fuse wire is connected in

(a) parallel (b) star connection (c) delta connection **(d) series**

55) Joules's heating effect is desirable in

(a) AC dynamo (b) DC dynamo **(c) water heater** (d) transformer

56) The sensitivity of a potentiometer can be increased by

(a) decreasing the length of potentiometer wire   **(b) increasing the length of potentiometer wire**   (c) increasing the emf of the cell used in primary circuit   (d) all the above

57) Two identical resistors are connected in parallel then connected in series. The effective resistance are in the ratio

(a) 1:2 (b) 2:1 (c) 1:4 (d) 4:1

58) The resistance of the wire varies inversely as

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

59) The ratio of voltage and current in a dosed circuit

(a) decreases (b) increases **(c) remains constant** (d) varies

60) The curve representing Ohm's law is a

(a) linear (b) parabola **(c) hyperbola** (d) none of the above

61) By increasing the temperature, the specific resistance of a conductor and a semiconductor

(a) increases for both   **(b) increases, decreases respectively**   (c) decreases for both   (d) decreases, increases respectively

62) The thermistors are usually made of

(a) metals with low temperature coefficient of resistivity   (b) metals with high temperature coefficient of resistivity   **(c) metal oxides with high temperature coefficient of resistivity**   (d) semi conducting materials with low temperature coefficient of resistivity

63) The resistivity of a wire depends on

(a) length (b) material (c) area of cross section **(d) all the above**

64) For which of the following substances, resistance decreases with temperature?
   (a) copper(b) platinum(c) mercury**(d) carbon**
65) Which material is having a small value of temperature coefficient of resistance?
   (a) copper(b) constantan or manganin(c) nichrome**(d) both b & c**
66) If the potential difference V applied across a conductor increased to 2V, the drift velocity of the electron be
   (a) doubled(b) halved(c) tripled(d) no change
67) Which energy is used to liberate the outer electron from the individual atoms?
   (a) Thermostatic external energy   **(b) Thermodynamic internal energy**   (c) Thermodynamic external energy   (d) Thermostatic internal energy
68) When the free electrons are moving in all possible directions, the value of the current produced is_____
   (a) IA(b) 2A**(c) 0 A**(d) 1.2A
69) The unit of electromotive force is_____
   (a) joule(b) newton(c) coulomb**(d) volt**
70) Generally the instantaneous current is represented by_____
   (a) i(b) I(c) dI(d) di
71) The direction of conventional current is taken as the direction of flow of
   (a) positive charges   (b) same direction of flow of electron   (c) opposite to positive charges   (d) all of these
72) Current is a_____
   (a) vector quantity**(b) scalar quantity**(c) particular direction(d) All the above
73) The drift velocity is equal to mobility when_____
   (a) the electric field is parallel to the motion of electrons'   **(b) the electric field is unity**   (c) the absence of electric field   (d) either (a) or (b)
74) Calculate the mobility of a free electron in an electric field of 10^{+2}N/C.
   (a) $10^{-4}m^2V^{-1}s^{-1}$**(b) $10^{-5}m^2V^{-1}s^{-1}$**(c) $10^{-3}m^2V^{-1}s^{-1}$(d) $10^{5}m^2V^{-1}s^{-1}$
75) A resistance of a metal wire of length AB is 2Ω. Another wire of length PQ of the same metal with twice the diameter of the wire AB is found to have the same resistance of2Ω. What is the length of PQ?
   (a) 4 AB(b) 2 AB(c) 1AB(d) 6 AB
76) The resistance of mercury is "0" when its temperature is reduced to_____
   (a) 4.2°C(b) 2.4°K**(c) 4.2 K**(d) -268.8 K
77) When three resistors are connected in series then the value of the effective resistance is
   (a) less than the individual resistance   **(b) greater than the individual resistance**   (c) greater than or equal to individual resistance   (d) less than or equal to individual resistance
78) These are behaving like thermistor
   (a) Insulators and conductors   (b) Semiconductors and conductors   (c) Conductors and alloys   **(d) Insulators and semiconductors**
79) Copper Wire metals and burns out when the current increases above_____
   (a) 5 A(b) 10 A(c) 25 A**(d) 25 A**
80) Carbon are furnaces produce temperature upto_____
   (a) 1500°C(b) 2000° C(c) 2500°C**(d) 3000°C**
81) Melting point of a tungsten filament inside a glass bulb is_____
   (a) 3360° C(b) 3340°C**(c) 3380°C**(d) 3370°C

82) Thermo electric generators are used in power plants to convert_____ into electricity ..
(a) light energy**(b) waste heat**(c) sound energy(d) hydro energy

83) The heat developed in half a minute resistor of resistance 5Ω is 15,000 joule. The current through the resistor is_____
(a) 5 A(b) 100 A(c) 40A**(d) 10A**

84) 2 A and 3A currents are passed through the heating element of an electrical iron box. The ratio of quantity of heat evolved is_____
(a) 2:3(b) 3:2**(c) 4:9**(d) 9:4

85) 5A of current flowing through a resistor for 2 minute produces 3000 j of heat. The value of the resistance is
(a) 1Ω(b) 2Ω(c) 4Ω(d) 5Ω

86) In a potentiometer a cell of emf 1.5 V balances at a length of 270 cm. If another cell balances at 360 cm for the same current its emf will be
(a) 1 V**(b) 2 V**(c) 3 V(d) 0.75 V

87) When a current of 5 A flows through a conductor of resistance 3 Ω the loss of power due to joule heating effect is_____
(a) 75 W(b) 25 W(c) 70.7 W(d) 45 W

88) The potentiometer wire is made of_____
(a) Manganin(b) Copper(c) Aluminium(d) Nichrome

89) Kirchoff's II law isa consequence of conservation of_____
(a) eharges(b) momentum**(c) energy**(d) power

90) The tolerance of sliver ring in resistors is_____
(a) 5%**(b) 10%**(c) 20 %(d) 2 %

91) Relation between current density and drift velocity is_____
(a) en V$_d$(b) nAeV$_d$(c) $\dfrac{n}{eV_d}$(d) $\dfrac{V_d}{ne}$

92) The average time between two successive collision of an electron is 3.64 x 10^{-8} s. its = mobility is
(a) 6.4 x 103 m2 V^{-I} S$^-$(b) 640 m^2 m V S$^-$(c) 6.4 X 103 m V$^-$ ^{1}S^{-1} (d) 6.4 x 10^3 m^2 V S$^-$ $_1$

93) A metal wire of current density is 3.2 x 10^7 Am^{-2} has 10^{28} electron/m^3. The average drift velocity is_____
(a) 0.02 m.s $^{-1}$(b) 200 m s^{-1}(c) 1.6 X 10^{-2} m s^{-1}(d) 3 x 10^{-2} m s $^{-1}$

94) How many electrons constitute current of one ampere?
(a) 6.35 x 10^{-19}(b) 6.28 x 10^{18}(c) 6.28 X 10^{20}**(d) 6.25 x 10^{18}**

95) The motion of electric charges is called_____
(a) static electricity(b) dynamic electricity(c) charge electricity**(d) current electricity**

96) The mobility of an electron is one million times less than that of its specific charge, the mean time taken between two successive collisions is_____
(a) 1ms(b) $1\mu s$(c) 1nano sec.(d) 1giga sec

97) A potential of 1 kV is applied between the ends of conductor of length 20 cm. The drift velocity of electron in this field is 3.52 x 10^6 m/s. The relaxation time for the freeelectrons is
(a) 2 nano sec**(b) 4 nano sec.**(c) 6 nano sec(d) 8 nano sec.

98) The unit of current density is_____

(a) Am^{-2}(b) Am^2(c) A^{2}m^{-2}(d) A^{-2}m^{-2}

99) The current is directly proportioncil to_____
   (a) mobility(b) number of electrons(c) electric field**(d) all the above**

100) The reciprocal of the resistance is_____
   (a) conductance(b) conductivity(c) resistivity(d) specific resistance

101) Resistance of a metal wire of length 10 cm is 2 !l.If the wire is stretched uniformly to 50 cm the resistance is_____
   (a) 25Ω(b) 10Ω(c) 5Ω**(d) 50Ω**

102) When the diameter of a conductor is doubled its resistance_____
   (a) decreases twice (b) decreases four times (c) decreases sixteen times **(d) increases four times**

103) The unit of conductivity is_____
   (a) mho**(b) ohm**(c) ohm-rn(d) mho-m-l

104) The reciprocal of conductivity is_____
   (a) specific conductance**(b) specific resistance**(c) resistance(d) conductance

105) The specific resistance for the insulators is in the range of_____
   (a) 10^{-6}10-^{8}Ωm**(b) 10^8-10^{14}Ωm**(c) 10^{-8}-10^{-14}Ωm(d) 10^{-8}-10^{14}Ωm

106) The specific resistance of silver is_____
   (a) 1.7X10^{-8}Ωm(b) 1.8X10^{-7}Ωm(c) 1.6X10^{8}Ωm**(d) 16X10^{-9}Ωm**

107) The specific resistance of silicon is_____
   (a) 0.46(b) 10X10^{-8}(c) 3200**(d) 2300**

108) Germanium and silicon are the examples of_____
   (a) insulators(b) conductors(c) semi insulators**(d) semiconductors**

109) The electrical resistivity drops to zero for_____
   (a) conductors(b) insulators**(c) super conductors**(d) semiconductors

110) The transition temperature of mercury is_____
   (a) 4.2°C**(b) 4.2 K**(c) 2.4°C(d) 2.4K

111) The phenomenon of superconductivity was first observed by_____
   (a) George Simon Ohm(b) Volta(c) Faraday Onnes**(d) Kammerlingh Onnes**

112) The temperature at which normal conductor is converted into super conductor is_____
   (a) neutral temperature (b) transition temperature (c) critical temperature **(d) both (b) and (c)**

113) The first theoretical explanation superconductivity was given by_____
   (a) BSC theory**(b) BCS theory**(c) SBC theory(d) None

114) For super conductors, the magnetic flux lines are_____
   (a) included**(b) excluded**(c) 0(d) maximum

115) Super conductors can be used as storage elements in_____
   (a) TV(b) camera**(c) computers**(d) computers

116) In a carbon resistor, the third ring represents_____
   (a) powers of zeros(b) powers of ten**(c) ten**(d) infinity

117) If there is no coloured ring in the right hand side of the carbon resistor, then the resistor has_____
   (a) 18% tolerance**(b) 20% tolerance**(c) 22% tolerance(d) 24% tolerance

118) The tolerance of the resistors are represented by_____
   (a) Silver - 10%, Gold - 5%, Red - 2%, Brown - 1% (b) Silver - 1%, Gold - 2%, Red - 5%, Brown - 10% (c) Silver - 1%, Gold - 10%, Red - 5%, Brown - 2% (d) Both (a) and (c)

119) The brown ring at one end of a carbon resistor indicates a tolerance of_____
   (a) ± 1%(b) ± 2%(c) ± 5%(d) ± 10%

120) When three resistors are connected in parallel then the value of the effective resistance is_____
   (a) less than or equal to individual resistance
   (b) greater than or equal to individual resistance
   (c) less than the individual resistance
   (d) greater than the individual resistance

121) The temperature coefficient of resistance is positive_____.
   (a) for metals(b) for insulators**(c) (a) and (b)**(d) all the above

122) The temperature coefficient of resistance is negative for_____
   (a) for metals**(b) ebonite**(c) (a) and (b)(d) none

123) The temperature coefficient of resistance increases for the metals when_____
   (a) the temperature increases
   (b) the temperature decreases
   (c) does not depend upon the temp~rature
   (d) either (a) or (b)

124) The unit of temperature coefficient of resistance is_____.
   (a) °C**(b) °C^{-1}**(c) -C^{-2}(d) °C^2

125) A cell of emf 2.2V sends a current of O.2A through a resistance of 10 n. The internal resistance of the cell is_____
   (a) 0.1Ω**(b) 1Ω**(c) 2Ω(d) 1.33Ω

126) Ohm's law is applicable only for_____
   (a) complicated circuits
   (b) primary circuits
   (c) simple circuits
   (d) secondary circuits

127) The algebraic sum of the currents meeting at any junction in the circuit is_____
   (a) infinity(b) negative value**(c) 2A**(d) zero

128) Kirchhoff's law is applicable only for_____
   (a) simple circuits
   (b) primary circuits
   (c) complicated circuits
   (d) secondary circuits

129) Kirchhoff's I law is named as_____
   (a) ohm's law(b) voltage law(c) resistance law**(d) current law**

130) Kirchhoff's II law is named as_____
   (a) voltage law(b) resistance in series(c) resistance in parallel(d) current law

131) Kirchhoff's I law is a consequence of_____
   (a) law of conservation of energy
   (b) law of conservation of charges
   (c) law of conservation of currents
   (d) law of conservation of voltages

132) In Kirchhoff's II law) the current in clockwise direction is taken as_____
   (a) positive(b) negative(c) neutral(d) no direction

133) In the case of Wheatstone)s Bridge) the bridge balance condition will be obtained only when_____
   (a) the current through the galvanometer is maximum
   (b) the current through the galvanometer is minimum
   (c) the current through the galvanometer is zero
   (d) the current through the galvanometer is infinity

134) In the case of meter bridge) manganin wire is used because it has_____
   (a) low temperature co~fficient of resistance
   (b) high temperature coefficient of resistance
   (c) temperature coefficient of resistance is zero
   (d) temperature coefficient of resistance is maximum

135) The small error in Meter Bridge experiment due to end resistance will be eliminated by_____

(a) by interchanging the resistances   (b) by interchanging the galvanometer and jockey   (c) by interchanging the battery and the jockey   (d) without changing the resistances

136) Potentiometer is an instrument used for the measurement of_____

(a) current   (b) resistance   (c) capacitance   **(d) potential difference**

137) The temperature Coetti unit of tungsten is_____$(oC)^{-1}$

(a) 3.9×10^{-3} **(b) 4.9×10^{-3}**   (c) 5.0×10^{-3} (d) 4×10^{-3}

<p align="center">Match the following</p>

138) Electric Heaters
   Nichrome

139) Electric Fuses
   Lead

140) Electric furnace
   Molybdenum

141) Electrical Lamp
   Tungsten

142) Current
   ampere

143) Resistance
   ohm

144) Power
   watt

145) Energy
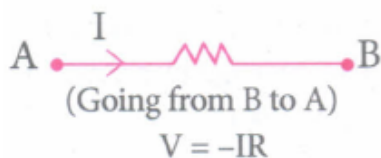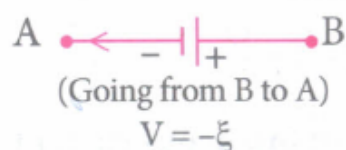   **joule**

<p align="center">Assertion and reason</p>

146) **Assertion**: Kirchoff's voltage rule can be expressed as
$$\varepsilon_1 + \varepsilon_2 + \varepsilon_3 + \ldots \varepsilon_n = I_1 R_1 + I_2 R_2 + \ldots I_n R_n$$
Reason :For the given diagrams

(a) Assertion and Reason are correct and Reason is the correct explanation of Assertion.

(b) Assertion and Reason are true but Reason is the false explanation of the Assertion.

(c) Assertion is true but Reason is False.

(d) Assertion is false but Reason is True

Answer : Assertion and ,Reason are correct and Reason is the correct explanation of Assertion.

147) **Assertion:** When the car engine is started with headlights turned on, they sometimes become bright

Reason : A galvanometer is extensively useful to compare the potential difference between various parts of the circuit

(a) Assertion and Reason are correct and Reason is the correct explanation of Assertion.

(b) Assertion and Reason are true but Reason is the false explanation of the Assertion.

(c) Assertion is true but Reason is False.

(d) Assertion is false but Reason is True

Answer : Assertion is false but Reason is True

<center>Odd one out</center>

148) (a) Copper
   (b) Iron
   (c) Manganin
   (d) Aluminiu
   Answer : Manganin

149) (a) Seebeck effect
   (b) Joule's effect
   (c) Thomson effect
   (d) Peltier effect
   Answer : Joule's effect

<center>Find out the wrong pair</center>

150)

a.	**Kirchhoff's I law**	-conservation of energy
b.	Ohm's law	-resistance
c.	Kirchhoff's IIlaw	-voltage law
d.	Joule's law	heating effect current

Which one is incorrect pair?

Answer : Kirchhoff's I law - conservation of energy