# Physics

## Chapterwise Practise Problems (CPP) for NEET

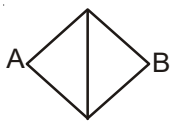
## Chapter - Current Electricity

1. The length, area of cross-section and density of a metallic wire are respectively 1 m, $10^{-6}$ $m^2$ and $5\times10^3$ $kg/m^3$. Assuming that each atom contributes one free electron, find the drift velocity of electrons if a current of 16 A flows through it. Given that the atomic wt. of the metal is 60 g/mol.

(1) 2 m/s (2) 0.2 m/s

(3) $2\times10^{-3}$ m/s (4) $2\times10^{-2}$ m/s

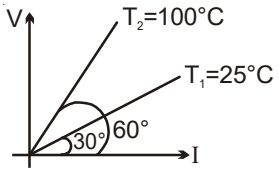
2. A uniform wire of resistance R is stretched uniformly to n times its original length and then cut to form five wires of equal length. These wires are arranged as shown in figure. The effective resistance between points A and B is




(1) $\frac{nR}{5}$ (2) $\frac{R}{5n}$

(3) $\frac{n^2R}{5}$ (4) $\frac{R}{5n^2}$

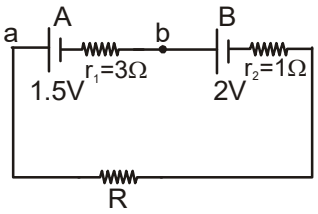
3. In the given figure, the potential difference 'V' has been plotted against current 'I' for a metallic conductor at two different temperatures 25°C and 100°C respectively. The temperature co-efficient of resistivity of the wire is




(1) $16\times10^{-2}$ / °C (2) $8\times10^{-2}$ / °C

(3) $4\times10^{-2}$ / °C (4) $2\times10^{-2}$ / °C

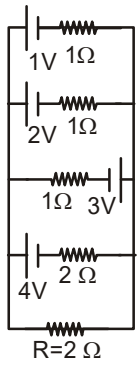
4. In the given circuit $r_1$ and $r_2$ are the internal resistances of the cells A and B. For what value of R, the terminal potential difference of cell A is zero ?




(1) 3 Ω (2) 4 Ω

(3) 2 Ω (4) 1 Ω

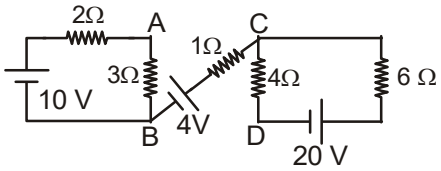
5. Four cells of emf 1V, 2V, 3V and 4V are connected in parallel as shown. If their internal resistances are respectively 1Ω, 1Ω, 1Ω and 2Ω, then the current through the external load resistance R is




(1) 2A (2) $\frac{7}{2}$ A

(3) $\frac{2}{7}$ A (4) $\frac{1}{4}$ A

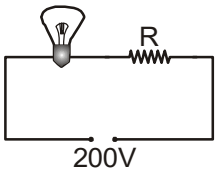
6. In the circuit shown, determine the magnitude of potential difference between A and D.




(1) 5 V (2) 10 V

(3) 20 V (4) 90 V

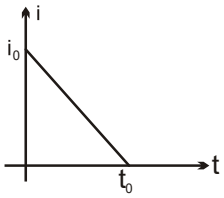
7. An electric bulb is designed to operate with a power of 500 W at 100 V line. It is connected in series with a resistor of resistance R. This combination is connected to 200 V supply as shown. The value of R so that the bulb delivers 500 W is




(1) 20 Ω (2) 10 Ω

(3) 5 Ω (4) 2.5 Ω

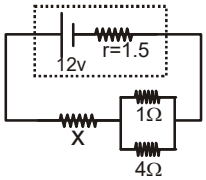
8. If the current in a coil of resistance R decreases according to (i–t) graph shown in the figure, then find the total heat produced in the coil, is




(1) $\frac{i_0^2 Rt_0}{5}$ (2) $\frac{i_0^2 Rt_0}{4}$

(3) $\frac{i_0^2 Rt_0}{3}$ (4) $\frac{i_0^2 Rt_0}{2}$

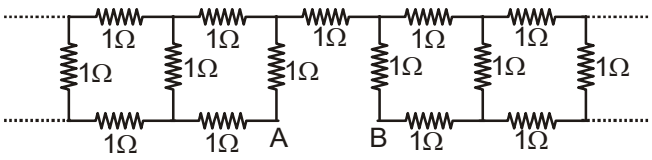
9. For what value of the resistance x the total power developed in the external resistors is maximum ?




(1) 0.5 Ω (2) 0.7 Ω

(3) 0.8 Ω (4) 1.5 Ω

10. Find the effective resistance between points A and B.




(1) $\sqrt{3}-1$ (2) $\sqrt{3}+1$

(3) $2\sqrt{3}-1$ (4) $3\sqrt{3}-1$

11. A galvanometer has a resistance of 30 ohm and a current of 2 mA is needed to give a full scale deflection. What is the resistance needed to convert this galvanometer into an ammeter of 3 A range ?

(1) 70 Ω (2) 0.02 Ω

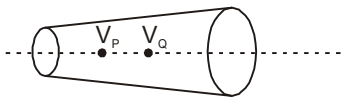
(3) 0.7 Ω (4) 20 Ω

12. The current rating of a fuse wire and its radius are related as

(1) $I \propto r^2$ (2) $I \propto r^3$

(3) $I \propto \sqrt{r}$ (4) $I \propto r^{\frac{3}{2}}$

13. A wire has non-uniform cross-section as shown in figure. A steady current flows through it. The drift speed of electrons at points P and Q is $V_p$ and $V_Q$ is:-




(1) $V_p = V_Q$ (2) $V_p < V_Q$

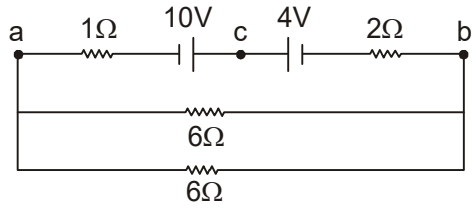
(3) $V_p > V_Q$ (4) Data insufficient

14. The length of the resistance wire is increased by 30% by stretching it. What is the corresponding change in resistance of wire?

(1) 30% (2) 55%

(3) 44% (4) 69%

15. The magnitude and direction of the current in the circuit shown will be




(1) $\frac{7}{3}$ A from a to b through c

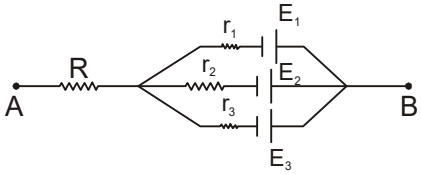
(2) $\frac{7}{3}$ A from b to a through c

(3) 1 A from a to b through c

(4) 1 A from b to a through c

16. In the network shown, the potential difference between A and B is

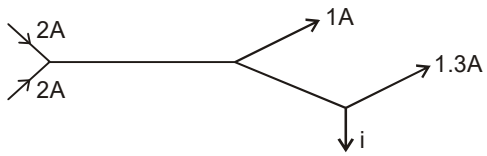
(R = $r_1$ = $r_2$= $r_3$ = 1Ω, $E_1$ = 3 V, $E_2$= 2 V, $E_3$ = 1V)




(1) 1 V (2) 2 V

(3) 3 V (4) 4 V

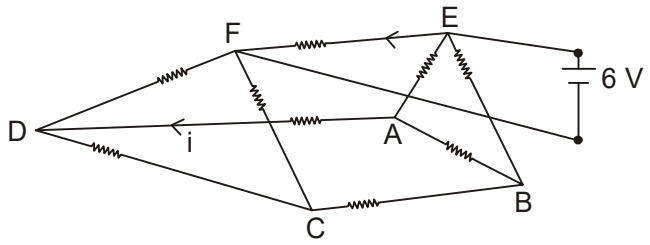
17. The figure below shows current in a part of electric circuit. The current i is:-




(1) 1.7A (2) 3.7A

(3) 1.3A (4) 1A

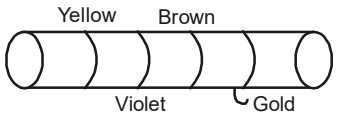
18. A prism is made of wire mesh with each side having equal resistance R. A battery of 6 V and zero internal resistance is connected across E and F as shown in the figure. The current in the branch AD, if R is equal to 5 Ω is,




(1) 0.6 A (2) 0.4 A

(3) 0.8 A (4) 2 A

19. The resistance of the following carbon resistor will be



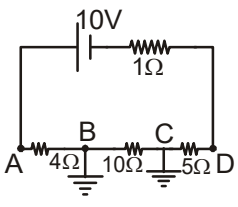

(1) (27×10)Ω ± 10%

(2) (24×10)Ω ± 6%

(3) (47×10)Ω ± 5%

(4) (22×15)Ω ± 11%

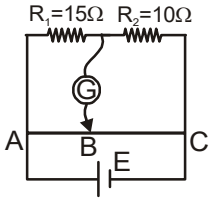
20. In the given figure point B and C are earthed. Then potential difference between point A and B is




(1) 4V (2) –5V

(3) 9V (4) 10V

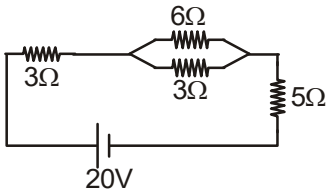
21. In the meter bridge shown in figure, the length AB for null deflection in galvanometer is




(1) 40 cm (2) 20 cm

(3) 80 cm (4) 60 cm

22. In the given circuit the heat developed across 6Ω resistor in 2s will be




(1) $\frac{32}{3}$J (2) $\frac{16}{3}$J

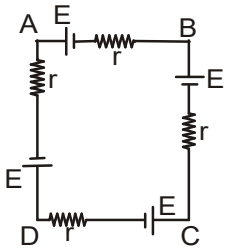
(3) 24J (4) 40J

23. If the radius of cross section of a conductor is increased by 0.1% keeping the volume constant, then percentage change in resistance of conductor is

(1) –0.2% (2) –0.1%

(3) –0.3% (4) –0.4%

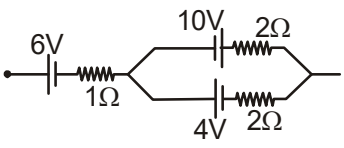
24. Four cells each of emf E and internal resistance r are connected in series to form a loop ABCD. Find the potential difference across AB




(1) 2E (2) E

(3) Zero (4) 4E

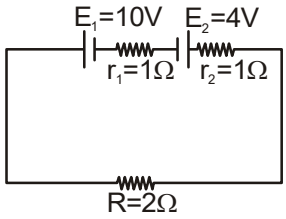
25. The emf and internal resistance of single battery which is the equivalent to the combination of three batteries as shown in figure are




(1) 2V, 3Ω (2) 3V, 2Ω

(3) 20V, 2Ω (4) 2V, 20Ω

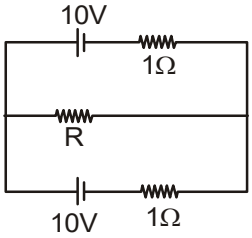
26. In the given circuit shown in figure the potential difference between battery 2 will be




(1) 5.5 volt (2) 8.5 volt

(3) 3 volt (4) 3.5 volt

27. The maximum power developed across a variable resistance R in the circuit shown in figure is




(1) 50 W (2) 75 W

(3) 25 W (4) 100 W

28. A current of 8 A flows in a metallic conductor of cross-section 1 $cm^2$ and length 10 km. Free electron density of copper is $5\times10^{28}/m^3$. The time taken by the electron to travel from one end of the conductor to the other is

(1) $10^8$ sec (2) $10^9$ sec

(3) $10^7$ sec (4) $10^5$ sec

29. A wire is stretched by 10% of its original length by applying a force. The percentage change in the resistance of wire is

(1) 21% (2) 10%

(3) 11% (4) 1%

30. Two resistors are connected in series. At 0°C, the values of first and second resistor are respectively R and 2R. The temperature coefficient of resistances of first and second resistors are $\alpha$ and $2\alpha$ respectively. The equivalent temperature coefficient of the resistor for the combination is

(1) $\frac{5\alpha}{4}$ (2) $\frac{4\alpha}{3}$

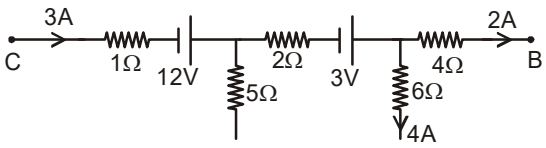
(3) $\frac{4\alpha}{5}$ (4) $\frac{5\alpha}{3}$

31. 3n identical cells each of emf 'E' and internal resistance 'r' are connected in series to form a closed circuit. If out of 3n cells, n cells are wrongly connected, then the terminal voltage across any one cell which is connected wrongly is

(1) $\frac{4E}{3}$ (2) $\frac{2E}{3}$

(3) $\frac{3E}{2}$ (4) $\frac{3E}{4}$

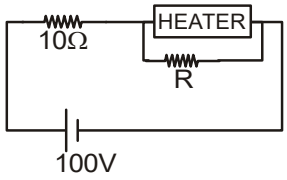
32. The figure shows part of certain circuit. The magnitude of potential difference between points C and B is




(1) 8V (2) 10V

(3) 12.5V (4) 15V

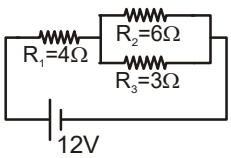
33. A heater rated for 1000 W at 100 V is used in the circuit having a 100 V supply. If the heater operates with a power of 62.5W, then the value of R is




(1) 2.5Ω (2) 20Ω

(3) 10Ω (4) 5Ω

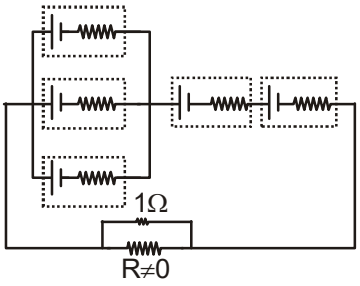
34. If $R_1$ of the given circuit is dipped in 1000 ml of water at 30°C, then the time after which the water starts boiling is. (take 1 cal = 4.2J)




(1) 1148.4 sec (2) 18375 sec

(3) 183.75 sec (4) 11.48 sec

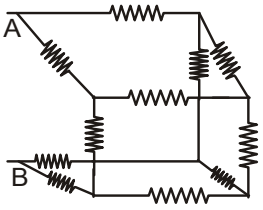
35. For maximum power developed in the circuit, the value of the internal resistance 'r' must be, if all the cells are identical, each of emf E and the internal resistance 'r'.




(1) $r < \frac{3}{7}\ \Omega$ (2) $r > \frac{3}{7}\ \Omega$

(3) $r = \frac{3}{7}\ \Omega$ (4) $r \geq \frac{3}{7}\ \Omega$

36. Eleven identical wire each of resistance R are connected as shown in the figure. The equivalent resistance between the points A and B is




(1) $\frac{7R}{12}$ (2) $\frac{5R}{6}$

(3) $\frac{7R}{5}$ (4) $\frac{3R}{4}$

37. A galvanometer can withstand safely a maximum current of 5 mA. It is converted into voltmeter reading upto 20 V by connecting in series an external resistance of 3950 Ω. The resistance of galvanometer is

(1) 48Ω (2) 44Ω

(3) 36Ω (4) 50Ω

38. The current capacity of a fuse wire is 5 ampere. If the radius of cross-section of wire is made 4 times, then the new current capacity of the wire will be

(1) 10 A (2) 20 A

(3) 40 A (4) 80 A

39. When a current 'I' flows through a wire, the drift velocity of the electrons is 'v'. When current 2I flows through another wire of the same material having double the length and double the area of cross section and same temperature the drift velocity of the electrons will be :

(1) $\frac{v}{8}$ (2) $\frac{v}{4}$

(3) $\frac{v}{2}$ (4) v

40. Ohm's law is true for

(1) Metallic conductors

(2) All conductors

(3) Electrolytes when current passes through them

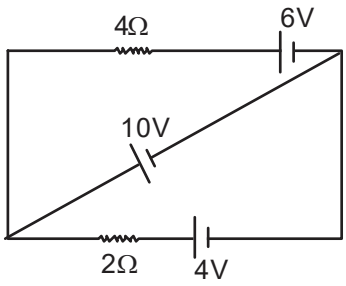
(4) Diode when current flows

41. A current of 0.9A flows through 2Ω resistor and 0.3A through 7Ω resistor when they are separately conected across a cell. The internal resistance of the cell is

(1) 0.5Ω (2) 1.0Ω

(3) 1.2Ω (4) 2.0Ω

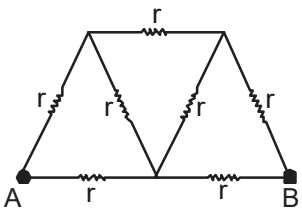
42. What is the current through the 10V battery ?




(1) 1A (2) 3A

(3) 4A (4) 2A

43. In the following circuit, what is the resistance across AB.




(1) $\frac{8r}{7}$ (2) $\frac{7r}{8}$

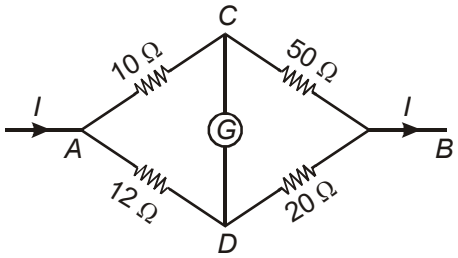
(3) $\frac{3r}{2}$ (4) $\frac{2r}{3}$

44. Microscopic form of ohm's law in usual notation is

(1) $\vec{J} = \sigma\vec{E}$ (2) $\vec{J} = \rho\vec{E}$

(3) $\vec{J} = R\vec{E}$ (4) $\vec{J} = \dfrac{\vec{E}}{R}$

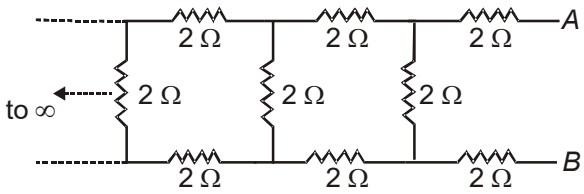
45. In the situation shown, what is the value of resistance connected between A and D in addition to 12 Ω resistance, so that galvanometer shows no deflection?




(1) 12 Ω (2) 6 Ω

(3) 4 Ω (4) 5 Ω

46. The equivalent resistance of the following infinite network of resistances between A & B is




(1) Less than 4 Ω

(2) 4 Ω

(3) 12 Ω

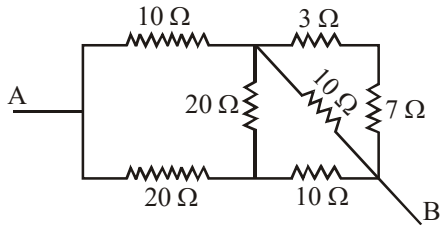
(4) More than 4 Ω but less than 12 Ω

47. The current in a conductor varies with time as I = 3t2, where I is in ampere and t in second. Electric charge flowing through section between t = 0 and t = 3 second

(1) 10 C (2) 34 C

(3) 27 C (4) 9 C

48. Find the effective resistance across A and B in the given circuit.




(1) 5 Ω (2) 10 Ω

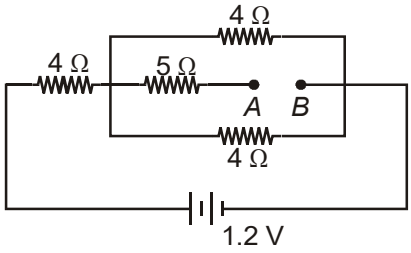
(3) 15 Ω (4) 20 Ω

49. In an electrostatic machine, a belt of width w, having a surface charge density σ, travels with velocity v. As the belt passes a certain point, all the charge are removed and is carried away as an electric current. The magnitude of this current is

(1) $wv\sigma$ (2) $\dfrac{w\sigma}{v}$

(3) $wv^2\sigma$ (4) $\dfrac{v\sigma}{w}$

50. The potential difference between A and B in the following circuit is




(1) 1.4 V (2) 0.4 V

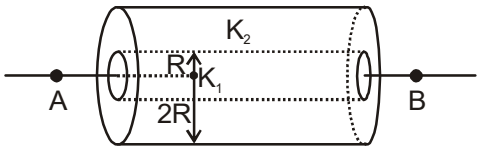
(3) 2.2 V (4) 1.2 V

51. Two primary cells of EMF $E_1$ and $E_2(E_1 > E_2)$ connected in series with identical orientation are balanced in a potentiometer. The balancing point on the potentiometer is obtained at 500 cm. When polarity of 2nd cell is reversed, the balance point is obtained at 100 cm. The ratio of EMF of two cells $(E_1/E_2)$ is

(1) 1 : 1 (2) 5 : 1

(3) 3 : 2 (4) 2 : 5

52. Two rods of electrical conductivities $K_1$ and $K_2$ are connected as shown in the figure. Find the equivalent electrical conductivity of the system




(1) $K_1 + K_2$ (2) $\dfrac{K_1 + 3K_2}{4}$

(3) $\dfrac{K_1 + 2K_2}{4}$ (4) $\dfrac{4K_2 - K_1}{4}$

53. The maximum current that can flow through a galvanometer is 5 mA. If the galvanometer has to be converted into an ammeter of range (0 – 10)A, which of the following would be preferred? (Resistance of galvanometer = 10Ω)

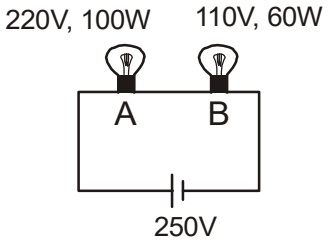
(1) 0.005Ω in parallel with galvanometer

(2) 0.005Ω in series with galvanometer

(3) 5000Ω in parallel with galvanometer

(4) 5000Ω in series with galvanometer

54. Two bulbs A and B are connected in series across a 250V supply. Identify the correct statement




(1) None of the bulb glows

(2) Both the bulbs glow with same intensity

(3) The potential difference across both the bulbs are equal

(4) The bulbs glows with different intensity

55. A current of 5 A is passing through a metallic wire of cross-sectional area $4\times10^{-6}\text{m}^2$. If the density of the charge carriers in the wire is $5\times10^{26}/\text{m}^3$, the drift velocity of the electrons is

(1) $\frac{1}{16}$ m/s (2) $\frac{1}{32}$ m/s

(3) $\frac{1}{64}$ m/s (4) $\frac{1}{128}$ m/s

56. The emf of a cell is $\varepsilon$ and its internal resistance is r. Its terminals are connected to resistance R. The potential difference between the terminal is 1.6V for $R=4\Omega$ and 1.8V for $R=9\Omega$. Then

(1) $\varepsilon=1V$, $r=1\Omega$

(2) $\varepsilon=2V$, $r=1\Omega$

(3) $\varepsilon=2V$, $r=2\Omega$

(4) $\varepsilon=2.5V$, $r=0.5\Omega$

57. A potentiometer is 100cm long and a constant potential difference is maintained across it. Two cells are connected in series first to support one another and then in opposite direction. The balance points are obtained at 50cm and 10cm from positive end of the wire in the two cases. The ratio of emf's is

(1) 3 : 2 (2) 5 : 1

(3) 5 : 4 (4) 3 : 4

58. The n rows each containing m cells in series are joined in parrallel. Maximum current is taken from this combination across an external resistance of $3\Omega$. If the total number of cells used are 24 and internal resistance of each cell is $0.5\Omega$ then

(1) $m=8$, $n=3$ (2) $m=6$, $n=4$

(3) $m=12$, $n=2$ (4) $m=2$, $n=12$

59. The mean free path of electrons in a metal is $4\times10^{-8}$ m. The electric field which can give on an average 2eV energy to an electron in the metal will be in (units of V/m).

(1) $5\times10^{-11}$ (2) $8\times10^{-11}$

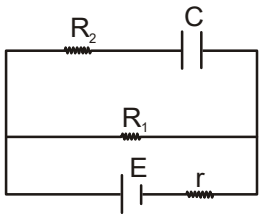
(3) $5\times10^{7}$ (4) $8\times10^{7}$

60. Three equal resistors connected in series across a source of emf together dissipate 10 watt. If the same resistors are connected in parallel across the same emf, the power dissipated will be

(1) 10 watt (2) 30 watt

(3) 10/3 watt (4) 90 watt

61. Charge on capacitor in steady state is




(1) $\frac{CER_1}{R_1+r}$ (2) $\frac{CEr}{R_1+r}$

(3) $\frac{CER_1}{r}$ (4) $\frac{CEr}{R_1}$

62. Find the average drift speed of free electrons in a copper wire of area of cross-section $10^{-7}\text{m}^2$ carrying current of 1.5 A and having free electron density $8.5\times10^{28}$ $\text{m}^{-3}$.

(1) 0.11 mm/s (2) 1.1 mm/s

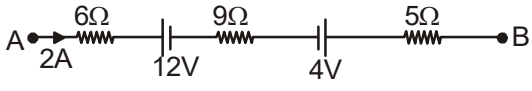
(3) 11mm/sec (4) 0.13 mm/sec

63. A 30 V, 90W lamp is to be operated on a 120V D.C. For proper glow, a resistor of '____' R '____' Ω should be connected in series with the lamp, then 'R' is

(1) 40 (2) 10

(3) 20 (4) 30

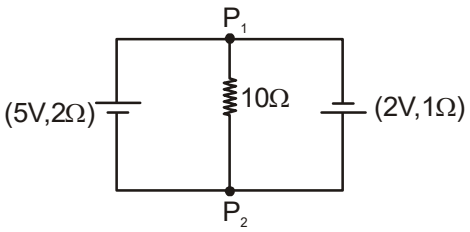
64. The potential difference between A and B in the following figure is




(1) 32V (2) 48V

(3) 24V (4) 14V

65. The current flowing is the 10Ω resistance as shown in the figure is




(1) 0.27 A, $P_2$ to $P_1$ (2) 0.03 A, $P_1$ to $P_2$

(3) 0.03 A $P_2$ to $P_1$ (4) 0.27A $P_1$ to $P_2$

66. n identical cells are joined correctly in series with another two cells 'A' and 'B' with reverse polarities. Emf of each cell is E and internal resistance is r. Potential difference across cell A is : (n > 4)

(1) $\frac{2E}{n}$ (2) $2E\left(1-\frac{1}{n}\right)$

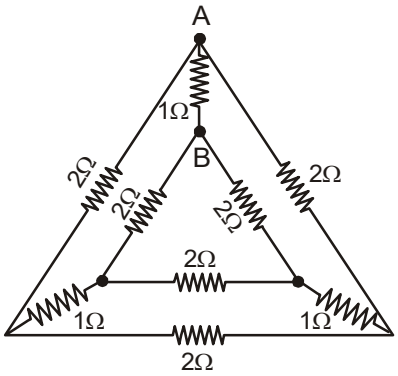
(3) $\frac{4E}{n}$ (4) $2E\left(1-\frac{2}{n+2}\right)$

67. A potentiometer wire of length 10 m and resistance 20 Ω is conneted in series with 15V battery and an external resistance 40Ω. A secondary cell of emf E in the secondary circuit is balanced by 240 cm long potentiometer wire, the emf E of the cell is

(1) 2.4 V (2) 1.2 V

(3) 2.0 V (4) 3.0 V

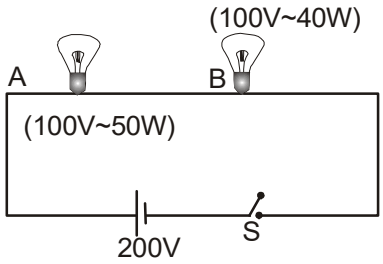
68. Calculate the equivalent resistance between points A and B in the following circuit.




(1) $\frac{7}{5}\Omega$ (2) $\frac{25}{6}\Omega$

(3) $\frac{5}{}\Omega$ (4) $\frac{6}{}\Omega$

69. Two bulbs 'A' and 'B' are connected as shown. When switch 'S' is closed then which among them will fuse?




(1) Bulb A

(2) Bulb B

(3) Both A and B will fuse

(4) Neighter of them will fuse

70. When a 40 $Vm^{-1}$ electric field is produced inside a conductor then $2\times10^4 A/m^2$ current density is established in it. Resistivity of the conductor is

(1) $2\times10^{-3}$ Ωm (2) $4\times10^{-3}$ Ωm

(3) $2\times10^{3}$ Ωm (4) $4\times10^{3}$ Ωm

71. Two electric bulbs rating $P_1$ watt- 'V' volt and $P_2$ watt-V volt are connected in parallel and V volt are applied to it. The total power will be

(1) $\frac{P_1P_2}{P_1+P_2}$ watt (2) $\sqrt{P_1P_2}$ watt

(3) $(P_1+P_2)$watt (4) $\frac{P_1+P_2}{P_1P_2}$ watt

72. A galvanometer of 50 ohm resistance has 25 divisions. A current of $4\times10^{-4}$ ampere gives a deflection of one division. To convert this galvanometer into a voltmeter having a range of 25 volts, it should be connected with a resistance of

(1) 2500Ω (2) 2450Ω

(3) 2550Ω (4) 2400Ω

73. The temperature coefficient of resistivity of a material is $4\times10^{-4}$/K. When the temperature of material is increased by 50°C, its resistivity increases by $2\times10^{-8}$Ωm. The initial resistivity of material (in ohm-meter) is

(1) $50\times10^{-8}$ (2) $90\times10^{-8}$

(3) $100\times10^{-8}$ (4) $200\times10^{-8}$

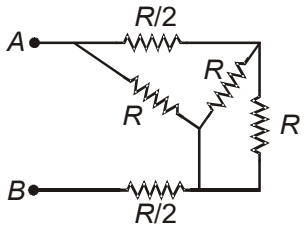
74. In a meter bridge with standard resistance of 5Ω in the left gap, the ratio of balancing length of meter bridge wire is 2 : 3. The unknown resistance is

(1) 1Ω (2) 15Ω

(3) 10Ω (4) 7.5Ω

75. A wire is made by the combination of thin and thick wire connected in series. The current density
(1) In thick wire is more
(2) In thin wire is more
(3) Is same in both
(4) Depends upon the voltage of battery

76. The effective resistance between A and B is

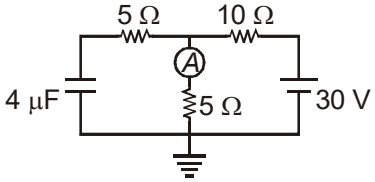



(1) $\frac{R}{2}$ (2) R

(3) $\frac{3R}{4}$ (4) 2R

77. Colour code in a resistor is given by bands of colours orange, yellow, brown. The value of resistance is
(1) 34 × 10 Ω ± 10% (2) 34 × 10 Ω ± 20%
(3) 24 × 102 Ω ± 10% (4) 24 × 104 Ω ± 10%

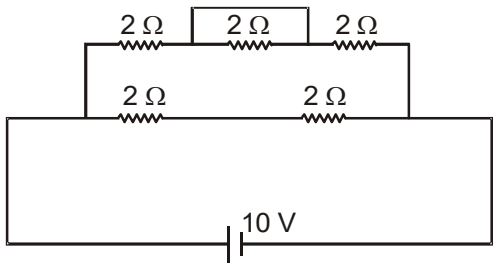
78. The reading of the ideal ammeter shown in the network at steady state is




(1) 6 A (2) 4 A
(3) 2 A (4) 1 A

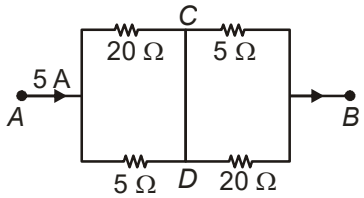
79. A current i = αt flows in a resistance R for time t seconds. The amount of heat developed during this interval will be (α is a constant)
(1) α2Rt (2) α2Rt3
(3) α2Rt2 (4) $\frac{\alpha^2 Rt^3}{3}$

80. The current drawn by the battery in the situation shown in figure is




(1) 2.5 A (2) 5 A
(3) 7.5 A (4) 1 A

81. In the circuit shown, if a current of 5 A is passing from A to B then




(1) No heating and no current between C and D
(2) C and D are at the same potential
(3) Current of 3 A flows from D to C
(4) Both (2) and (3)

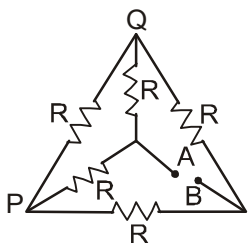
82. A heater coil connected across a given potential difference has power P. Now, the coil is cut into two equal halves of its length and joined in parallel. Across the same potential difference, this combination has power
(1) P (2) 4P
(3) P/4 (4) 2P

83. On increasing temperature, resistivity of material
(1) Always increases
(2) Always decreases
(3) May increase or decrease
(4) Remains constant

84. A galvanometer with a scale divided into 100 equal divisions has a current sensitivity of 10 divisions per mA and voltage sensitivity of 2 divisions per mV. What adaptations are required to read 1 division per volt?
(1) A resistance of 9995Ω in series
(2) A resistance of 10000Ω in series
(3) A resistance of 9990Ω in series
(4) A resistance of 1000Ω in series

85. A wire AB of length 100 cm and resistance 4Ω is connected in series to a battery of EMF 5 V and internal resistance 1Ω. Potential gradient along the wire is
(1) 0.4 V/cm (2) 4 V/cm
(3) 0.04 V/cm (4) 0.05 V/cm

86. If each of the resistances in the network shown in figure is R, what is the resistance between terminals A and B?




(1) R (2) 2R
(3) 3R (4) 4R

87. n identical bulbs, each designed to draw P power from a certain voltage supply are joined in series and combination is connected across that supply. The power consumed by one bulb will be

(1) nP (2) P

(3) $\frac{P}{n}$ (4) $\frac{P}{n^2}$

88. A steady current flows in a metallic conductor of non uniform cross-section. The quantity/quantities that remain constant along the length of conductor is/are

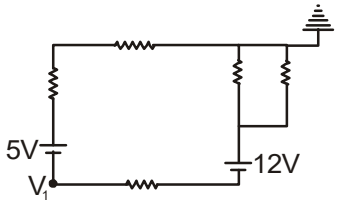
(1) current, electric field and drift speed

(2) drift speed only

(3) current and drift speed

(4) current only

89. In the circuit shown, each resistance is 2Ω. The potential $V_1$ as indicated in the circuit is equal to




(1) 11V (2) –11V

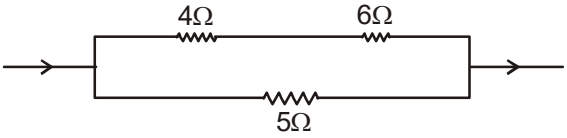
(3) 9V (4) –9V

90. The resistance of an iron bar when temperature is raised from 0°C to 100°C is (Initial resistance = 1.43 Ω & temperature co-efficient of resistivity = 0.00501/°C)

(1) 5.32Ω (2) 2.16Ω

(3) 8.2Ω (4) 15.2Ω

91. In the circuit shown in figure, the heat produced in the 5Ω resistor due to the current flowing through it is 10 cal/s.




The heat generated in 4Ω resistor is

(1) 1cal/s (2) 2cal/s

(3) 3cal/s (4) 4cal/s

92. Two cells of emf E each and internal resistances $r_1$ and $r_2$ ($r_1 > r_2$) are connected in series across a load resistance 'R'. If potential difference across the first cell (internal resistance = $r_1$) is zero, then the relation between R, $r_1$, and $r_2$ is

(1) $R = r_1 + r_2$ (2) $R = r_1 r_2$

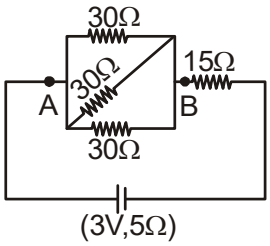
(3) $R = \sqrt{r_1^2 + r_2^2}$ (4) $R = (r_1 - r_2)$

93. A current is flowing through a cylindrical conductor of radius R such that current density at any cross section is given by $J = J_0 \frac{r}{R}$, where r is the radial distance from the axis of the cylinder. Calculate the total current through the cross-section.

(1) $\frac{J_0 \pi R^2}{2}$ (2) $\frac{J_0 \pi R^2}{3}$

(3) $\frac{2}{3} J_0 \pi R^2$ (4) $\frac{J_0 \pi R^2}{6}$

94. Calculate the potential difference across AB as shown in the figure




(1) 2V (2) 3V

(3) 1V (4) 1.5V

95. If the potential difference across a circuit is $V = (10 \pm 0.1)$ volt and resistance is measured as $R = (2 \pm 0.04)\Omega$. Calculate the value of current flowing in the circuit

(1) $(5 \pm 0.15)$amp (2) (5 ± 0.1)amp

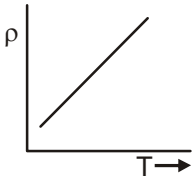
(3) (5 ± 0.3)amp (4) (5 ± 0.2)amp

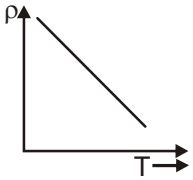
96. The masses of three wires of copper are in ratio of 1 : 3 : 5 and their lengths are is the ratio 5 : 3 : 1. The ratio of their electrical resistances is:

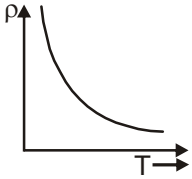
(1) 1 : 3 : 5 (2) 15 : 3 : 1

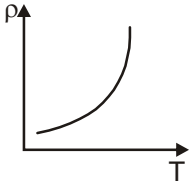
(3) 1 : 15 : 125 (4) 125 : 15 : 1

97. The temperature (T) dependence of resistivity [ρ] of a semi-conductor is given by

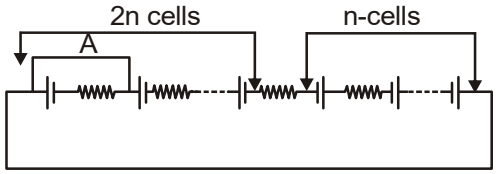
(1) 


(2) 


(3) 


(4) 

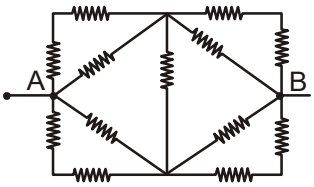
98. The figure shows 3n cells connected in series to form a circuit r is the internal resistance of each cell and e is the emf of each cell. If polarity of n cells are reversed find the terminal voltage across A.




(1) $\frac{e}{3}$ (2) Zero

(3) $\frac{3e}{2}$ (4) $\frac{2e}{5}$

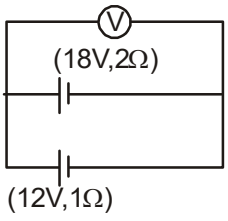
99. Thirteen resistances each of resistance R ohm are connected is the circuit as shown in the adjoining figure. The effective resistance between 'A' and 'B' is




(1) 2RΩ (2) $\frac{4R}{3}\Omega$

(3) $\frac{2R}{3}\Omega$ (4) RΩ

100. Two batteries along with their internal resistance are connected as shown. Find the reading of the voltmeter.




(1) 30 V (2) 18 V

(3) 15 V (4) 14 V

101. Number of (60W–230V) lamps that may be safely run on a 230 volt circuit fitted with a 5 amp fuse

(1) 2 (2) 19

(3) 20 (4) 4

102. Keeping the mass of the conductor constant, its radius of cross section is increased by 0.5%. Calculate the percentage change in the resistance

(1) Increases by 4% (2) Increases by 2%

(3) decreases by 2% (4) decreases by 1%

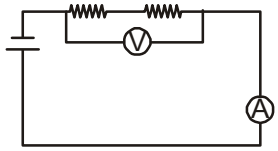
103. If a battery of fixed emf e and internal resistance r is connected to a variable external resistance R, then the condition for which the power delivered by the battery to the load will be maximum, is

(1) $r = \frac{R}{2}$ (2) r = R

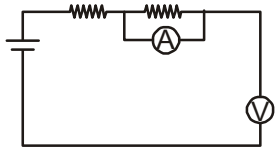
(3) r = 4R (4) $r = \frac{R}{3}$

104. The arrangement that is correct regarding the voltmeter and Ammeter connection in a circuit

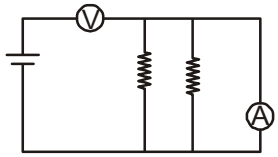
(1)



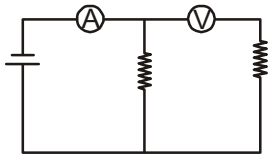

(2)




(3)




(4)

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**CPP-03**
**ONE YEAR**
**MEDICAL-2021-22**

# ANSWERS

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | (3) | 2. | (3) | 3. | (2) | 4. | (1) | 5. | (4) | 6. | (2) | 7. | (1) |
| 8. | (3) | 9. | (2) | 10. | (3) | 11. | (2) | 12. | (4) | 13. | (3) | 14. | (4) |
| 15. | (3) | 16. | (2) | 17. | (1) | 18. | (2) | 19. | (3) | 20. | (1) | 21. | (4) |
| 22. | (2) | 23. | (4) | 24. | (3) | 25. | (2) | 26. | (1) | 27. | (1) | 28. | (2) |
| 29. | (1) | 30. | (4) | 31. | (1) | 32. | (1) | 33. | (4) | 34. | (2) | 35. | (1) |
| 36. | (3) | 37. | (4) | 38. | (3) | 39. | (4) | 40. | (1) | 41. | (1) | 42. | (3) |
| 43. | (1) | 44. | (1) | 45. | (2) | 46. | (4) | 47. | (3) | 48. | (2) | 49. | (1) |
| 50. | (2) | 51. | (3) | 52. | (2) | 53. | (1) | 54. | (4) | 55. | (3) | 56. | (2) |
| 57. | (1) | 58. | (3) | 59. | (3) | 60. | (4) | 61. | (1) | 62. | (2) | 63. | (4) |
| 64. | (2) | 65. | (2) | 66. | (4) | 67. | (2) | 68. | (3) | 69. | (2) | 70. | (1) |
| 71. | (3) | 72. | (2) | 73. | (3) | 74. | (4) | 75. | (2) | 76. | (2) | 77. | (2) |
| 78. | (3) | 79. | (4) | 80. | (2) | 81. | (4) | 82. | (2) | 83. | (3) | 84. | (1) |
| 85. | (3) | 86. | (1) | 87. | (4) | 88. | (4) | 89. | (4) | 90. | (2) | 91. | (2) |
| 92. | (4) | 93. | (3) | 94. | (3) | 95. | (1) | 96. | (4) | 97. | (3) | 98. | (2) |
| 99. | (3) | 100. | (4) | 101. | (2) | 102. | (3) | 103. | (2) | 104. | (1) | | |

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