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NEET CURRENT ELECTRICITY — PYQS

Max. Marks: 448 **Questions:** 112

Section A (MCQ) — 112 questions

Q.1 A room heater is rated 400 W, 220 V. If the supply voltage drops to 200 V, what will be the power consumed (approximately) ? [NEET (UG) 2026]

(1) 400 W (2) 121 W (3) 331 W (4) 200 W

Scan or tap for the full solution

Q.2 A resistor is connected to a battery of 12 V emf and internal resistance 2 Ω. If the current in the circuit is 0.6 A, the terminal voltage of the battery is : [NEET (UG) 2026]

(1) 12 V (2) 1.2 V (3) 10 V (4) 10.8 V

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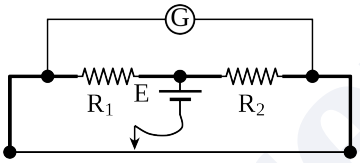
Q.3 In a metre bridge experiment (see figure), the positions of the cell, E, and galvanometer, G, are interchanged. We shall observe in the galvanometer: [NEET (UG) 2026]



(1) Only the right-sided deflection

(2) Only the left-sided deflection

(3) There will be no deflection irrespective of the position of the jockey

(4) Both right-sided and left-sided deflection and at balance point, no deflection

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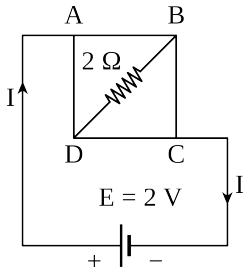
Q.4 A uniform metallic wire having resistance 4 Ω is bent to form a square loop (ABCD) (see figure). A resistance of 2 Ω is connected between points B and D and a battery of 2 V is connected across points A and C as shown in the figure. Now the value of current (I) is : [NEET (UG) 2026]



(1) 4 A (2) 4.5 A (3) 8 A (4) 2 A

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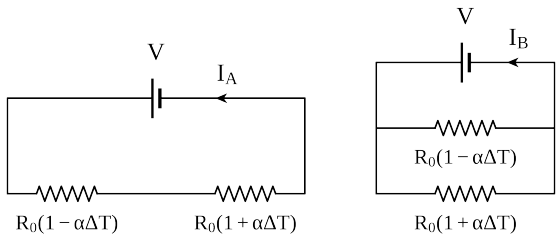
Q.5 Consider two circuits, (A) and (B), each having two resistors. One of them has a positive temperature coefficient of resistance, +α, while the other one has a negative temperature of coefficient, −α, as shown in the figure. The current through these circuits are denoted by I_A and I_B. At initial temperature, the resistance of the two resistors is R_0. As the temperature is increased, the correct option that describes the variation of current in these circuits is: [RE-NEET (UG) 2026]



(1) both I_A and I_B remain constant

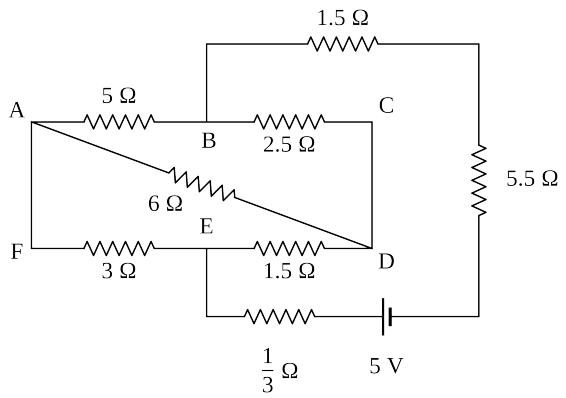
(2) I_A remains constant while I_B increases

(3) I_A decreases while I_B increases

(4) I_A increases while I_B decreases

Scan or tap for the full solution

Q.6 The current passing through the battery in the given circuit, is: [NEET (UG) 2025]



(1) 2.5 A (2) 1.5 A (3) 2.0 A (4) 0.5 A

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Q.7 A wire of resistance R is cut into 8 equal pieces. From these pieces two equivalent resistances are made by adding four of these together in parallel. Then these two sets are added in series. The net effective resistance of the combination is:

[NEET (UG) 2025]

(1) $\frac{R}{16}$ (2) $\frac{R}{8}$ (3) $\frac{R}{64}$ (4) $\frac{R}{32}$

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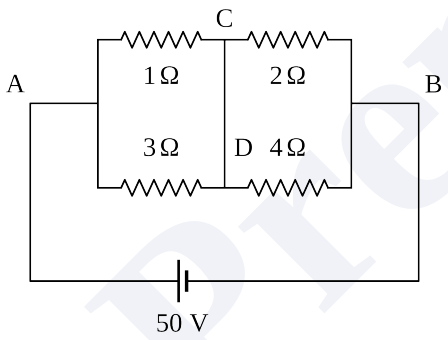
Q.8 A constant voltage of 50 V is maintained between the points A and B of the circuit shown in the figure. The current through the branch CD of the circuit is:

[NEET (UG) 2025]



(1) 2.5 A (2) 3.0 A (3) 1.5 A (4) 2.0 A

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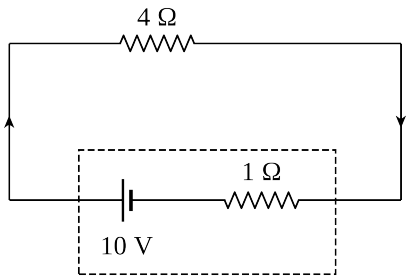
Q.9 The terminal voltage of the battery, whose emf is 10 V and internal resistance 1 Ω, when connected through an external resistance of 4 Ω as shown in the figure is:

[NEET (UG) 2024]



(1) 4 V (2) 6 V (3) 8 V (4) 10 V

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Q.10 A wire of length 'l' and resistance 100 Ω is divided into 10 equal parts. The first 5 parts are connected in series while the next 5 parts are connected in parallel. The two combinations are again connected in series. The resistance of this final combination is:

[NEET (UG) 2024]

(1) 26 Ω (2) 52 Ω (3) 55 Ω (4) 60 Ω

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Q.11 Two heaters A and B have power rating of 1 kW and 2 kW, respectively. Those two are first connected in series and then in parallel to a fixed power source. The ratio of power outputs for these two cases is:

[NEET (UG) 2024]

(1) 1:1 (2) 2:9 (3) 1:2 (4) 2:3

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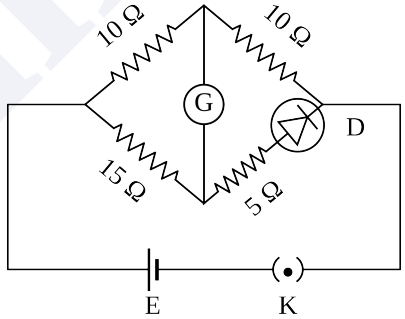
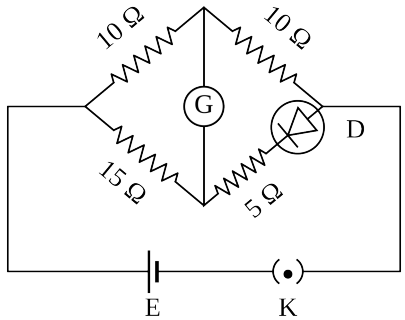
Q.12 Choose the correct circuit which can achieve the bridge balance.

[NEET (UG) 2024]

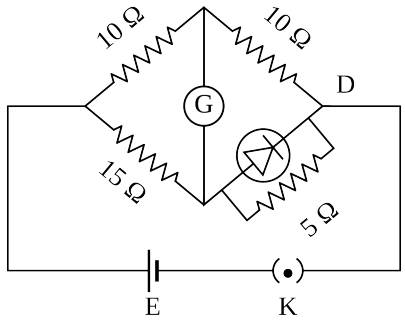
(1)



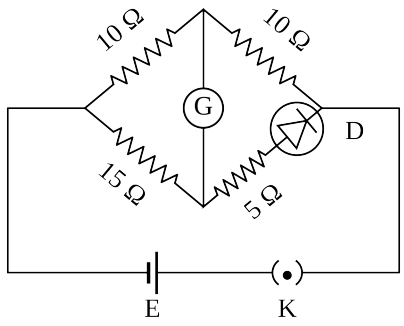
(2)



(3)



(4)



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Q.13 A uniform wire of diameter d carries a current of 100 mA when the mean drift velocity of electrons in the wire is v. For a wire of diameter $\frac{d}{2}$ of the same material to carry a current of 200 mA, the mean drift velocity of electrons in the wire is [RE-NEET (UG) 2024]

(1) 4v (2) 8v (3) v (4) 2v

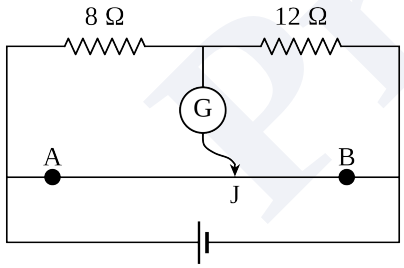
Scan or tap for the full solution

Q.14 A uniform metal wire of length l has 10 Ω resistance. Now this wire is stretched to a length 2l and then bent to form a perfect circle. The equivalent resistance across any arbitrary diameter of that circle is [RE-NEET (UG) 2024]

(1) 10 Ω (2) 5 Ω (3) 40 Ω (4) 20 Ω

Scan or tap for the full solution

Q.15 The given circuit shows a uniform straight wire AB of 40 cm length fixed at both ends. In order to get zero reading in the galvanometer G, the free end of J is to be placed from B at: [RE-NEET (UG) 2024]



(1) 32 cm (2) 8 cm (3) 16 cm (4) 24 cm

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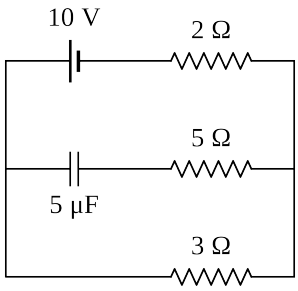
Q.16 The steady state current in the circuit shown below is : [RE-NEET (UG) 2024]



(1) 0.67 A (2) 1.5 A (3) 2 A (4) 1 A

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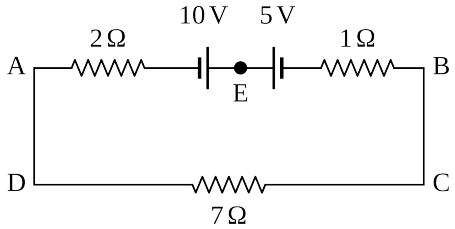
Q.17 The magnitude and direction of the current in the following circuit is :- [NEET (UG) 2023]



(1) 0.5 A from A to B through E

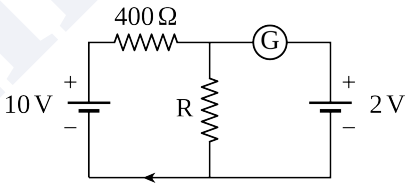
(2) $\frac{5}{9}$ A from A to B through E

(3) 1.5 A from B to A through E

(4) 0.2 A from B to A through E

Scan or tap for the full solution

Q.18 If the galvanometer G does not show any deflection in the circuit shown, the value of R is given by: [NEET (UG) 2023]



(1) 50 Ω (2) 100 Ω (3) 400 Ω (4) 200 Ω

Scan or tap for the full solution

Q.19 Resistance of a carbon resistor determined from colour codes is (22000 ± 5%) Ω. The colour of third band must be : [NEET (UG) 2023]

(1) Green (2) Orange (3) Yellow (4) Red

Scan or tap for the full solution

Q.20 The resistance of platinum wire at 0°C is 2 Ω and 6.8 Ω at 80°C. The temperature coefficient of resistance of the wire is : [NEET (UG) 2023]

(1) 3×10^{-3} °C^{-1} (2) 3×10^{-2} °C^{-1}

(3) 3×10^{-10} °C^{-1} (4) 3×10^{-4} °C^{-1}

Scan or tap for the full solution

Q.21 10 resistors, each of resistance R are connected in series to a battery of emf E and negligible internal resistance. Then those are connected in parallel to the same battery, the current is increased n times. The value of n is : [NEET (UG) 2023]

(1) 100 (2) 1 (3) 1000 (4) 10

Scan or tap for the full solution

Q.22 As the temperature increases, the electrical resistance [NEET (UG) 2022]

(1) Increases for both conductors and semiconductors

(2) Decreases for both conductors and semiconductors

(3) Increases for conductors but decreases for semiconductors

(4) Decreases for conductors but increases for semiconductors

Scan or tap for the full solution

Q.23 Two resistors of resistance, 100 Ω and 200 Ω are connected in parallel in an electrical circuit. The ratio of the thermal energy developed in 100 Ω to that in 200 Ω in a given time is [NEET (UG) 2022]

(1) 1:2 (2) 2:1 (3) 1:4 (4) 4:1

Scan or tap for the full solution

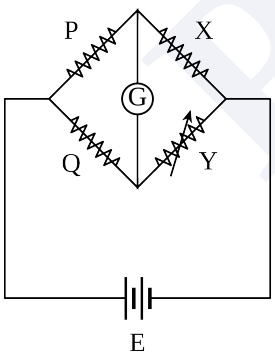
Q.24 A copper wire of length 10 m and radius $\left(\frac{10^{-2}}{\sqrt{\pi}}\right)$ m has electrical resistance of 10 Ω. The current density in the wire for an electric field strength of 10 (V/m) is [NEET (UG) 2022]

(1) 10^4 A/m^2 (2) 10^6 A/m^2

(3) 10^{-5} A/m^2 (4) 10^5 A/m^2

Scan or tap for the full solution

Q.25 A wheatstone bridge is used to determine the value of unknown resistance X by adjusting the variable resistance Y as shown in the figure. For the most precise measurement of X, the resistance P and Q [NEET (UG) 2022]



(1) Should be approximately equal to 2X

(2) Should be approximately equal and are small

(3) Should be very large and unequal

(4) Do not play any significant role

Scan or tap for the full solution

Q.26 The reciprocal of resistance is : [NEET (UG) 2022 (Phase 2)]

(1) conductance (2) reactance

(3) mobility (4) conductivity

Scan or tap for the full solution

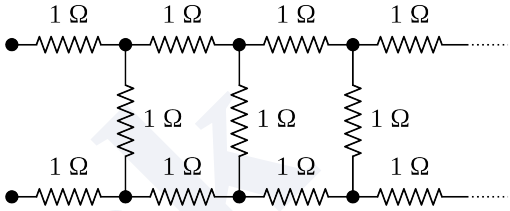
Q.27 A cell of emf 4 V and internal resistance 0.5 Ω is connected to a 7.5 Ω external resistance. The terminal potential difference of the cell is [NEET (UG) 2022 (Phase 2)]

(1) 0.375 V (2) 3.75 V

(3) 4.25 V (4) 4 V

Solution

Q.28 The equivalent resistance of the infinite network given below is : [NEET (UG) 2022 (Phase 2)]

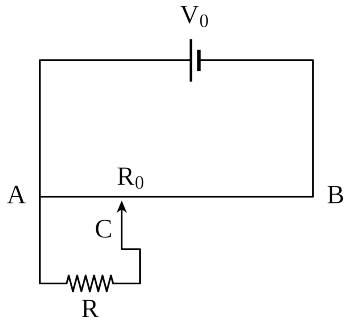


(1) $(1+\sqrt{5})\Omega$ (2) 2 Ω

(3) $(1+\sqrt{2})\Omega$ (4) $(1+\sqrt{3})\Omega$

Scan or tap for the full solution

Q.29 The sliding contact C is at one fourth of the length of the potentiometer wire (AB) from A as shown in the circuit diagram. If the resistance of the wire AB is R_0, then the potential drop (V) across the resistor R is [NEET (UG) 2022 (Phase 2)]



(1) $\frac{2V_0R}{2R_0+3R}$ (2) $\frac{4V_0R}{3R_0+16R}$

(3) $\frac{4V_0R}{3R_0+R}$ (4) $\frac{2V_0R}{4R_0+R}$

Scan or tap for the full solution

Q.30 In a potentiometer circuit a cell of EMF 1.5 V gives balance point at 36 cm length of wire. If another cell of EMF 2.5 V replaces the first cell, then at what length of the wire, the balance point occurs? [NEET (UG) 2021]

(1) 62 cm (2) 60 cm

(3) 21.6 cm (4) 64 cm

Solution

Q.31 The effective resistance of a parallel connection that consists of four wires of equal length, equal area of cross-section and same material is 0.25 Ω. What will be the effective resistance if they are connected in series? [NEET (UG) 2021]

(1) 4 Ω (2) 0.25 Ω (3) 0.5 Ω (4) 1 Ω

Scan or tap for the full solution

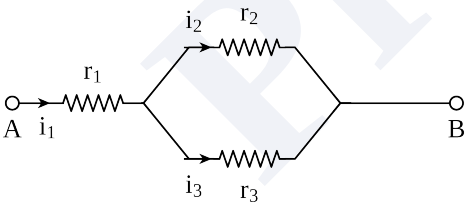
Q.32 **Column - I** gives certain physical terms associated with flow of current through a metallic conductor. **Column-II** gives some mathematical relations involving electrical quantities. Match **column-I** and **column-II** with appropriate relations. [NEET (UG) 2021]

Column - I		Column - II	
A.	Drift Velocity	P.	$\frac{m}{ne^2\rho}$
B.	Electrical Resistivity	Q.	nev_d
C.	Relaxation Period	R.	$\frac{eE}{m}\tau$
D.	Current Density	S.	$\frac{E}{J}$

(1) (A)-(R); (B)-(Q); (C)-(S); (D)-(P)
(2) (A)-(R); (B)-(S); (C)-(P); (D)-(Q)
(3) (A)-(R); (B)-(S); (C)-(Q); (D)-(P)
(4) (A)-(R); (B)-(P); (C)-(S); (D)-(Q)

Scan or tap for the full solution

Q.33 Three resistors having resistances r_1, r_2 and r_3 are connected as shown in the given circuit. The ratio $\frac{i_3}{i_1}$ of currents in terms of resistances used in the circuit is : [NEET (UG) 2021]



(1) $\frac{r_2}{r_1+r_3}$ (2) $\frac{r_1}{r_2+r_3}$ (3) $\frac{r_2}{r_2+r_3}$ (4) $\frac{r_1}{r_1+r_2}$

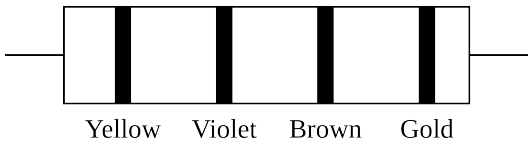
Scan or tap for the full solution

Q.34 A resistance wire connected in the left gap of a metre bridge balances a 10 Ω resistance in the right gap at a point which divides the bridge wire in the ratio 3:2. If the length of the resistance wire is 1.5 m, then the length of 1 Ω of the resistance wire is : [NEET (UG) 2020]

(1) 1.0×10^{-1} m (2) 1.5×10^{-1} m
(3) 1.5×10^{-2} m (4) 1.0×10^{-2} m

Scan or tap for the full solution

Q.35 The color code of a resistance is given below :



The values of resistance and tolerance, respectively, are [NEET (UG) 2020]

(1) 47 kΩ, 10% (2) 4.7 kΩ, 5%
(3) 470 Ω, 5% (4) 470 kΩ, 5%

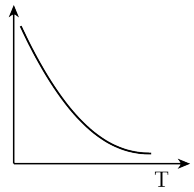
Scan or tap for the full solution

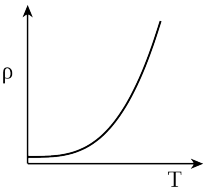
Q.36 A charged particle having drift velocity 7.5×10^{-4} m s^{-1} in an electric field of 3×10^{-10} V m^{-1} has a mobility in m^2 V^{-1} s^{-1} of : [NEET (UG) 2020]

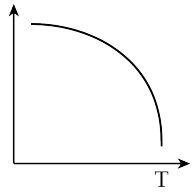
(1) 2.5×10^{6} (2) 2.5×10^{-6}
(3) 2.25×10^{-15} (4) 2.25×10^{15}

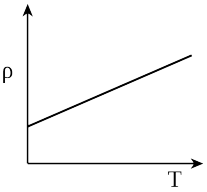
Scan or tap for the full solution

Q.37 Which of the following graph represents the variation of resistivity (ρ) with temperature (T) for copper? [NEET (UG) 2020]

(1)


(2)


(3)


(4)


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Q.38 The solids which have the negative temperature coefficient of resistance are : [NEET (UG) 2020]

(1) insulators only
(2) semiconductors only
(3) insulators and semiconductors
(4) metals

Solution

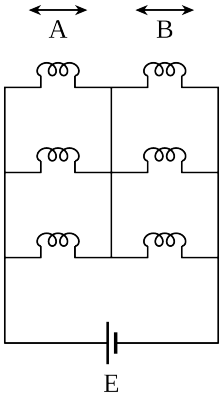
Q.39 Which of the following acts as a circuit protection device? [NEET (UG) 2019]

(1) inductor (2) conductor
(3) switch (4) fuse

Scan or tap for the full solution

Q.40 Six similar bulbs are connected as shown in the figure with a DC source of emf E, and zero internal resistance.

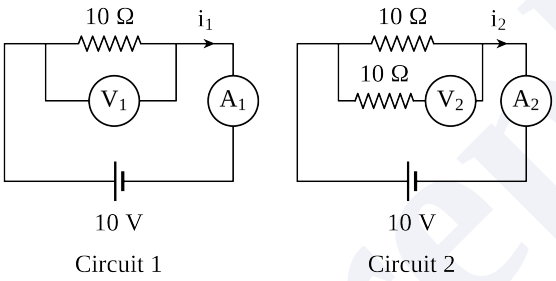
The ratio of power consumption by the bulbs when (i) all are glowing and (ii) in the situation when two from section A and one from section B are glowing, will be : [NEET (UG) 2019]



(1) 4 : 9 (2) 9 : 4 (3) 1 : 2 (4) 2 : 1

Scan or tap for the full solution

Q.41 In the circuits shown below, the readings of voltmeters and the ammeters will be : [NEET (UG) 2019]



(1) $V_1 = V_2$ and $i_1 = i_2$ (2) $V_1 > V_2$ and $i_1 > i_2$
(3) $V_1 > V_2$ and $i_1 = i_2$ (4) $V_1 = V_2$ and $i_1 > i_2$

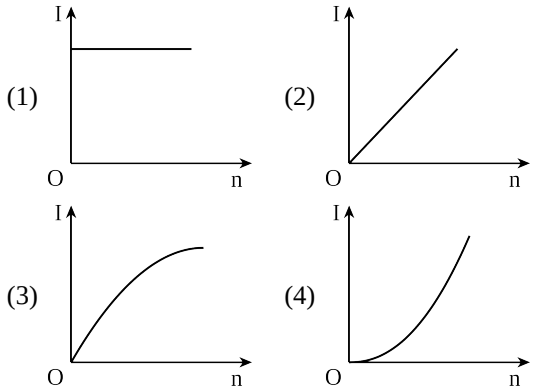
Scan or tap for the full solution

Q.42 A set of n equal resistors, of value R each, are connected in series to a battery of emf E and internal resistance R. The current drawn is I. Now, the n resistors are connected in parallel to the same battery. Then the current drawn from battery becomes 10I. The value of n is [NEET 2018]

(1) 10 (2) 11 (3) 20 (4) 9

Scan or tap for the full solution

Q.43 A battery consists of a variable number n of identical cells (having internal resistance r each) which are connected in series. The terminals of the battery are short-circuited and the current I is measured. Which of the graphs shows the correct relationship between I and n? [NEET 2018]



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Q.44 A carbon resistor of (47 ± 4.7) kΩ is to be marked with rings of different colours for its identification. The colour code sequence will be [NEET 2018]

(1) Violet – Yellow – Orange – Silver
(2) Yellow – Violet – Orange – Silver
(3) Yellow – Green – Violet – Gold
(4) Green – Orange – Violet – Gold

Scan or tap for the full solution

Q.45 The resistance of a wire is 'R' ohm. If it is melted and stretched to 'n' times its original length, its new resistance will be [NEET 2017]

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

Scan or tap for the full solution

Q.46 A potentiometer is an accurate and versatile device to make electrical measurements of EMF because the method involves [NEET 2017]

(1) potential gradients
(2) a condition of no current flow through the galvanometer
(3) a combination of cells, galvanometer and resistances
(4) cells

Scan or tap for the full solution

Q.47 A potentiometer wire is 100 cm 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 50 cm and 10 cm from the positive end of the wire in the two cases. The ratio of emf's is [NEET 2016 (Phase 1)]

(1) 3 : 4 (2) 3 : 2 (3) 5 : 1 (4) 5 : 4

Scan or tap for the full solution

Q.48 The charge flowing through a resistance R varies with time t as $Q = at - bt^2$, where a and b are positive constants. The total heat produced in R is

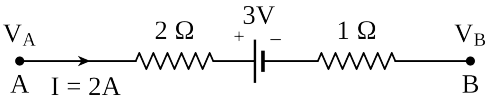
[NEET 2016 (Phase 1)]

(1) $\frac{a^3R}{2b}$ (2) $\frac{a^3R}{b}$ (3) $\frac{a^3R}{6b}$ (4) $\frac{a^3R}{3b}$

Scan or tap for the full solution

Q.49 The potential difference $(V_A - V_B)$ between the points A and B in the given figure is

[NEET 2016 (Phase 2)]



(1) −3 V (2) +3 V (3) +6 V (4) +9 V

Scan or tap for the full solution

Q.50 A filament bulb (500 W, 100 V) is to be used in a 230 V main supply. When a resistance R is connected in series, it works perfectly and the bulb consumes 500 W. The value of R is

[NEET 2016 (Phase 2)]

(1) 230 Ω (2) 46 Ω (3) 26 Ω (4) 13 Ω

Scan or tap for the full solution

Q.51 Two metal wires of identical dimensions are connected in series. If σ_1 and σ_2 are their conductivities, the effective conductivity of the combination is [AIPMT 2015]

(1) $\frac{\sigma_1+\sigma_2}{\sigma_1\sigma_2}$ (2) $\frac{\sigma_1\sigma_2}{\sigma_1+\sigma_2}$

(3) $\frac{2\sigma_1\sigma_2}{\sigma_1+\sigma_2}$ (4) $\frac{\sigma_1+\sigma_2}{2\sigma_1\sigma_2}$

Scan or tap for the full solution

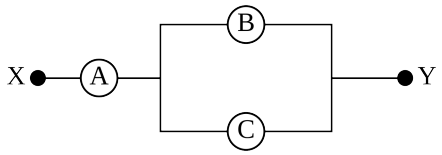
Q.52 A potentiometer wire of length L and a resistance r are connected in series with a battery of e.m.f. E_0 and a resistance r_1. An unknown e.m.f. E is balanced at a length l of the potentiometer wire. The e.m.f. E will be given by [AIPMT 2015]

(1) $\frac{E_0 l}{L}$ (2) $\frac{LE_0 r}{(r+r_1)l}$

(3) $\frac{LE_0 r}{lr_1}$ (4) $\frac{E_0 r}{(r+r_1)} \cdot \frac{l}{L}$

Scan or tap for the full solution

Q.53 A, B and C are voltmeters of resistance R, 1.5R and 3R respectively as shown in the figure. When some potential difference is applied between X and Y, the voltmeter readings are V_A, V_B and V_C respectively, Then [AIPMT 2015 (Cancelled)]



(1) $V_A = V_B \neq V_C$ (2) $V_A \neq V_B \neq V_C$

(3) $V_A = V_B = V_C$ (4) $V_A \neq V_B = V_C$

Scan or tap for the full solution

Q.54 Across a metallic conductor of non-uniform cross section a constant potential difference is applied. The quantity which remains constant along the conductor is [AIPMT 2015 (Cancelled)]

(1) drift velocity (2) electric field

(3) current density (4) current

Scan or tap for the full solution

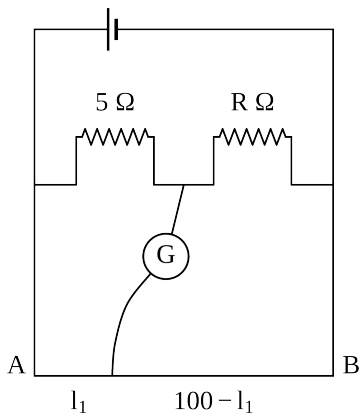
Q.55 A potentiometer wire has length 4 m and resistance 8 Ω. The resistance that must be connected in series with the wire and an accumulator of e.m.f. 2 V, so as to get a potential gradient 1 mV per cm on the wire is [AIPMT 2015 (Cancelled)]

(1) 44 Ω (2) 48 Ω (3) 32 Ω (4) 40 Ω

Scan or tap for the full solution

Q.56 The resistances in the two arms of the meter bridge are 5 Ω and R Ω respectively. When the resistance R is shunted with an equal resistance, the new balance point is at $1.6\ l_1$. The resistance R is

[AIPMT 2014]



(1) 10 Ω (2) 15 Ω (3) 20 Ω (4) 25 Ω

Scan or tap for the full solution

Q.57 Two cities are 150 km apart. Electric power is sent from one city to another city through copper wires. The fall of potential per km is 8 volt and the average resistance per km is 0.5 Ω. The power loss in the wire is [AIPMT 2014]

(1) 19.2 W (2) 19.2 kW
(3) 19.2 J (4) 12.2 kW

Scan or tap for the full solution

Q.58 A potentiometer circuit has been set up for finding the internal resistance of a given cell. The main battery, used across the potentiometer wire, has an emf of 2.0 V and a negligible internal resistance. The potentiometer wire itself is 4 m long. When the resistance R, connected across the given cell, has values of (i) infinity, (ii) 9.5 Ω, the balancing lengths on the potentiometer wire are found to be 3 m and 2.85 m, respectively. The value of internal resistance of the cell is [AIPMT 2014]

(1) 0.25 Ω (2) 0.95 Ω (3) 0.5 Ω (4) 0.75 Ω

Scan or tap for the full solution

Q.59 The resistances of the four arms P, Q, R and S in a Wheatstone's bridge are 10 ohm, 30 ohm, 30 ohm and 90 ohm, respectively. The e.m.f. and internal resistance of the cell are 7 volt and 5 ohm respectively. If the galvanometer resistance is 50 ohm, the current drawn from the cell will be [NEET 2013]

(1) 0.1 A (2) 2.0 A (3) 1.0 A (4) 0.2 A

Scan or tap for the full solution

Q.60 The internal resistance of a 2.1 V cell which gives a current of 0.2 A through a resistance of 10 Ω is [NEET 2013]

(1) 0.8 Ω (2) 1.0 Ω (3) 0.2 Ω (4) 0.5 Ω

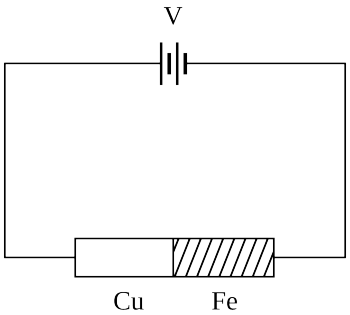
Scan or tap for the full solution

Q.61 A wire of resistance 4 Ω is stretched to twice its original length. The resistance of stretched wire would be [NEET 2013]

(1) 8 Ω (2) 16 Ω (3) 2 Ω (4) 4 Ω

Scan or tap for the full solution

Q.62 Two rods are joined end to end, as shown. Both have a cross-sectional area of 0.01 cm^2. Each is 1 meter long. One rod is of copper with a resistivity of 1.7×10^{-6} ohm-centimeter, the other is of iron with a resistivity of 10^{-5} ohm-centimeter.

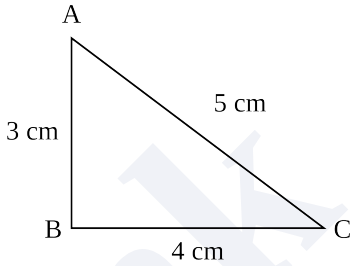


How much voltage is required to produce a current of 1 ampere in the rods? [NEET 2013 (Karnataka)]

(1) 0.00145 V (2) 0.0145 V
(3) 1.7×10^{-6} V (4) 0.117 V

Scan or tap for the full solution

Q.63 A 12 cm wire is given a shape of a right angled triangle ABC having sides 3 cm, 4 cm and 5 cm as shown in the figure. The resistance between two ends (AB, BC, CA) of the respective sides are measured one by one. Their ratio is [NEET 2013 (Karnataka)]



(1) 9 : 16 : 25 (2) 27 : 32 : 35
(3) 21 : 24 : 25 (4) 3 : 4 : 5

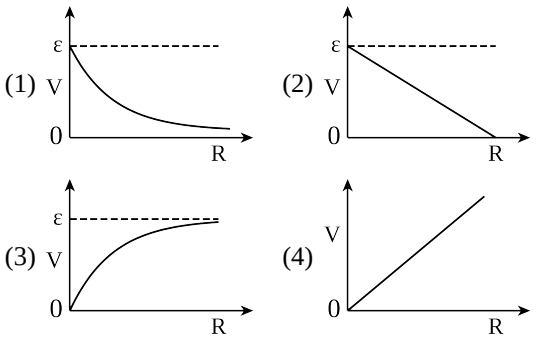
Scan or tap for the full solution

Q.64 Ten identical cells connected in series are needed to heat a wire of length one meter and radius 'r' by 10°C in time 't'. How many cells will be required to heat the wire of length two meter of the same radius by the same temperature in time 't' ? [NEET 2013 (Karnataka)]

(1) 20 (2) 30 (3) 40 (4) 10

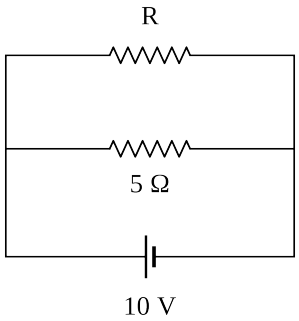
Scan or tap for the full solution

Q.65 A cell having an emf ε and internal resistance r is connected across a variable external resistance R. As the resistance R is increased, the plot of potential difference V across R is given by [AIPMT 2012 (Mains)]



Scan or tap for the full solution

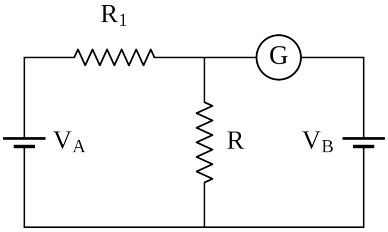
Q.66 The power dissipated in the circuit shown in the figure is 30 watts. The value of R is [AIPMT 2012 (Mains)]



(1) 20 Ω (2) 15 Ω (3) 10 Ω (4) 30 Ω

Scan or tap for the full solution

Q.67 In the circuit shown the cells A and B have negligible resistances. For V_A = 12 V, R_1 = 500 Ω and R = 100 Ω the galvanometer (G) shows no deflection. The value of V_B is [AIPMT 2012 (Prelims)]

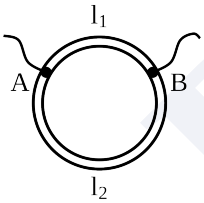


(1) 4 V (2) 2 V (3) 12 V (4) 6 V

Scan or tap for the full solution

Q.68 A ring is made of a wire having a resistance R_0 = 12 Ω. Find the points A and B, as shown in the figure, at which a current carrying conductor should be connected so that the resistance R of the sub circuit between these points is equal to $\frac{8}{3}$ Ω.

[AIPMT 2012 (Prelims)]



(1) $\frac{l_1}{l_2}=\frac{5}{8}$ (2) $\frac{l_1}{l_2}=\frac{1}{3}$ (3) $\frac{l_1}{l_2}=\frac{3}{8}$ (4) $\frac{l_1}{l_2}=\frac{1}{2}$

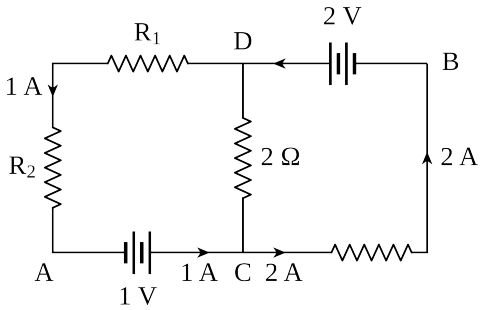
Scan or tap for the full solution

Q.69 If voltage across a bulb rated 220 volt-100 watt drops by 2.5% of its rated value, the percentage of the rated value by which the power would decrease is [AIPMT 2012 (Prelims)]

(1) 20% (2) 2.5% (3) 5% (4) 10%

Scan or tap for the full solution

Q.70 In the circuit shown in the figure, if the potential at point A is taken to be zero, the potential at point B is [AIPMT 2011 (Mains)]



(1) +1 V (2) −1 V (3) +2 V (4) −2 V

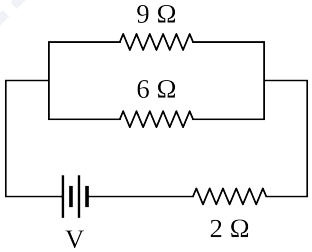
Scan or tap for the full solution

Q.71 A current of 2 A flows through a 2 Ω resistor when connected across a battery. The same battery supplies a current of 0.5 A when connected across a 9 Ω resistor. The internal resistance of the battery is [AIPMT 2011 (Prelims)]

(1) 0.5 Ω (2) 1/3 Ω (3) 1/4 Ω (4) 1 Ω

Scan or tap for the full solution

Q.72 If power dissipated in the 9 Ω resistor in the circuit shown is 36 watt, the potential difference across the 2 Ω resistor is [AIPMT 2011 (Prelims)]



(1) 4 volt (2) 8 volt (3) 10 volt (4) 2 volt

Scan or tap for the full solution

Q.73 Consider the following two statements.
Which of the following is correct?

A. Kirchhoff's junction law follows from the conservation of charge.

B. Kirchhoff's loop law follows from the conservation of energy. [AIPMT 2010 (Prelims)]

(1) Both (A) and (B) are wrong

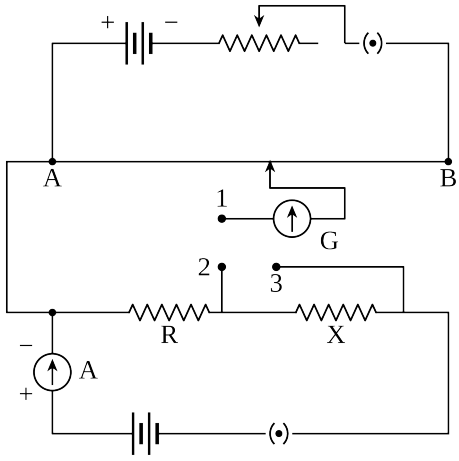
(2) (A) is correct and (B) is wrong

(3) (A) is wrong and (B) is correct

(4) Both (A) and (B) are correct

Solution

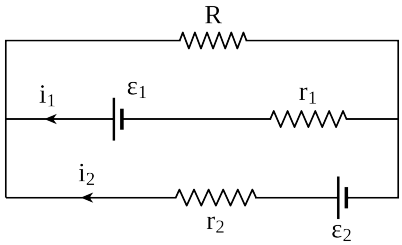
Q.74 A potentiometer circuit is set up as shown. The potential gradient, across the potentiometer wire, is k volt/cm and the ammeter, present in the circuit, reads 1.0 A when two way key is switched off. The balance points, when the key between the terminals (i) 1 and 2 (ii) 1 and 3, is plugged in, are found to be at length l_1 cm and l_2 cm respectively. The magnitudes, of the resistors R and X, in ohms, are then, equal, respectively, to [AIPMT 2010 (Prelims)]



(1) $k(l_2 - l_1)$ and kl_2 (2) kl_1 and $k(l_2 - l_1)$
(3) $k(l_2 - l_1)$ and kl_1 (4) kl_1 and kl_2

Scan or tap for the full solution

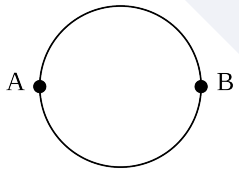
Q.75 See the electrical circuit shown in this figure. Which of the following equations is a correct equation for it ? [AIPMT 2009]



(1) $\varepsilon_2 - i_2r_2 - \varepsilon_1 - i_1r_1 = 0$
(2) $-\varepsilon_2 - (i_1 + i_2)R + i_2r_2 = 0$
(3) $\varepsilon_1 - (i_1 + i_2)R + i_1r_1 = 0$
(4) $\varepsilon_1 - (i_1 + i_2)R - i_1r_1 = 0$

Solution

Q.76 A wire of resistance 12 ohms per metre is bent to form a complete circle of radius 10 cm. The resistance between its two diametrically opposite points, A and B as shown in the figure is [AIPMT 2009]



(1) 3 Ω (2) 6π Ω (3) 6 Ω (4) 0.6π Ω

Scan or tap for the full solution

Q.77 A student measures the terminal potential difference (V) of a cell (of emf ε and internal resistance r) as a function of the current (I) flowing through it. The slope, and intercept, of the graph between V and I, then respectively, equal [AIPMT 2009]

(1) −r and ε (2) r and −ε
(3) −ε and r (4) ε and −r

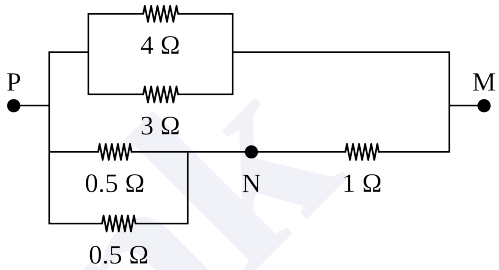
Scan or tap for the full solution

Q.78 The mean free path of electrons in a metal is 4×10^{-8} m. The electric field which can give on an average 2 eV energy to an electron in the metal will be in units V/m [AIPMT 2009]

(1) 5×10^{-11} (2) 8×10^{-11}
(3) 5×10^{7} (4) 8×10^{7}

Scan or tap for the full solution

Q.79



In the circuit shown, the current through the 4 Ω resistor is 1 amp when the points P and M are connected to a d.c. voltage source. The potential difference between the points M and N is [AIPMT 2008]

(1) 0.5 volt (2) 3.2 volt
(3) 1.5 volt (4) 1.0 volt

Scan or tap for the full solution

Q.80 A wire of a certain material is stretched slowly by ten percent. Its new resistance and specific resistance become respectively [AIPMT 2008]

(1) both remain the same
(2) 1.1 times, 1.1 times
(3) 1.2 times, 1.1 times
(4) 1.21 times, same

Solution

Q.81 A cell can be balanced against 110 cm and 100 cm of potentiometer wire, respectively without and with being short circuited through a resistance of 10 Ω. Its internal resistance is [AIPMT 2008]

(1) 2.0 ohm (2) zero
(3) 1.0 ohm (4) 0.5 ohm

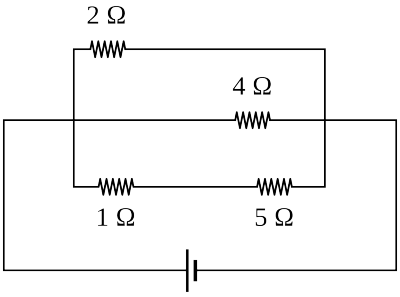
Scan or tap for the full solution

Q.82 An electric kettle takes 4 A current at 220 V. How much time will it take to boil 1 kg of water from temperature 20°C ? The temperature of boiling water is 100°C [AIPMT 2008]

(1) 12.6 min (2) 4.2 min
(3) 6.3 min (4) 8.4 min

Scan or tap for the full solution

Q.83 A current of 3 amp. flows through the 2 Ω resistor shown in the circuit. The power dissipated in the 5 Ω resistor is [AIPMT 2008]



(1) 1 watt (2) 5 watt (3) 4 watt (4) 2 watt

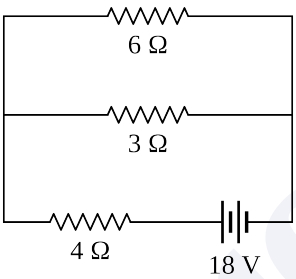
Scan or tap for the full solution

Q.84 Three resistances, P, Q, R each of 2 Ω and an unknown resistance S form the four arms of a Wheatstone bridge circuit. When a resistance of 6 Ω is connected in parallel to S the bridge gets balanced. What is the value of S? [AIPMT 2007]

(1) 3 Ω (2) 6 Ω (3) 1 Ω (4) 2 Ω

Scan or tap for the full solution

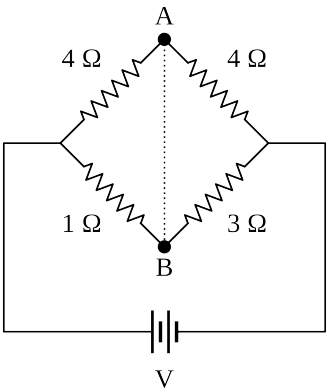
Q.85 The total power dissipated in watt in the circuit shown here is [AIPMT 2007]



(1) 40 (2) 54 (3) 4 (4) 16

Scan or tap for the full solution

Q.86 In the circuit shown, if a conducting wire is connected between points A and B, the current in this wire will [AIPMT 2006]



(1) flow from B to A
(2) flow from A to B
(3) flow in the direction which will be decided by the value of V
(4) be zero

Scan or tap for the full solution

Q.87 Kirchhoff's first and second laws of electrical circuits are consequences of [AIPMT 2006]

(1) conservation of energy and electric charge respectively
(2) conservation of energy
(3) conservation of electric charge and energy respectively
(4) conservation of electric charge

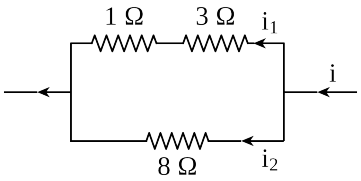
Scan or tap for the full solution

Q.88 Two cells, having the same e.m.f. are connected in series through an external resistance R. Cells have internal resistances r_1 and r_2 ($r_1 > r_2$) respectively. When the circuit is closed, the potential difference across the first cell is zero. The value of R is [AIPMT 2006]

(1) $r_1 + r_2$ (2) $r_1 - r_2$ (3) $\frac{r_1 + r_2}{2}$ (4) $\frac{r_1 - r_2}{2}$

Scan or tap for the full solution

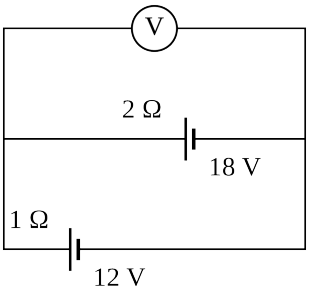
Q.89 Power dissipated across the 8 Ω resistor in the circuit shown here is 2 watt. The power dissipated in watt units across the 3 Ω resistor is [AIPMT 2006]



(1) 3.0 (2) 2.0 (3) 1.0 (4) 0.5

Scan or tap for the full solution

Q.90 Two batteries, one of emf 18 volts and internal resistance 2 Ω and the other of emf 12 volts and internal resistance 1 Ω, are connected as shown. The voltmeter V will record a reading of [AIPMT 2005]



(1) 30 volt (2) 18 volt (3) 15 volt (4) 14 volt

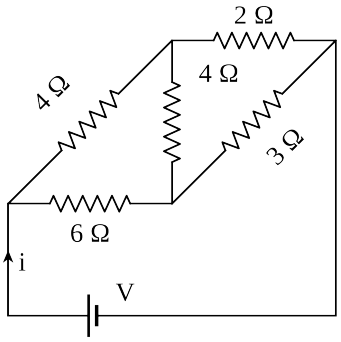
Scan or tap for the full solution

Q.91 When a wire of uniform cross-section a, length l and resistance R is bent into a complete circle, the resistance between any two diametrically opposite points will be [AIPMT 2005]

(1) R/4 (2) 4R (3) R/8 (4) R/2

Scan or tap for the full solution

Q.92 For the network shown in the figure the value of the current i is [AIPMT 2005]



(1) $\frac{9V}{35}$ (2) $\frac{18V}{5}$ (3) $\frac{5V}{9}$ (4) $\frac{5V}{18}$

Scan or tap for the full solution

Q.93 A 5-ampere fuse wire can withstand a maximum power of 1 watt in the circuit. The resistance of the fuse wire is [AIPMT 2005]

(1) 0.04 ohm (2) 0.2 ohm

(3) 5 ohm (4) 0.4 ohm

Scan or tap for the full solution

Q.94 The electric resistance of a certain wire of iron is R. If its length and radius are both doubled, then [AIPMT 2004]

(1) The resistance will be doubled and the specific resistance will be halved.

(2) The resistance will be halved and the specific resistance will remain unchanged.

(3) The resistance will be halved and the specific resistance will be doubled.

(4) The resistance and the specific resistance, will both remain unchanged.

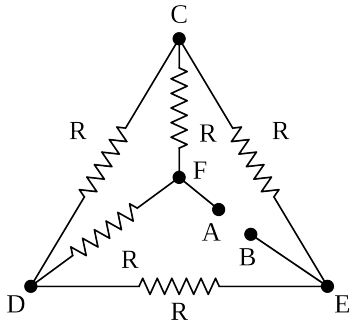
Scan or tap for the full solution

Q.95 Resistances n, each of r ohm, when connected in parallel give an equivalent resistance of R ohm. If these resistances were connected in series, the combination would have a resistance in ohms, equal to [AIPMT 2004]

(1) n^2R (2) R/n^2 (3) R/n (4) nR

Scan or tap for the full solution

Q.96 Five equal resistances each of resistance R are connected as shown in the figure. A battery of V volts is connected between A and B. The current flowing in AFCEB will be [AIPMT 2004]



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

Scan or tap for the full solution

Q.97 A 6 volt battery is connected to the terminals of a three metre long wire of uniform thickness and resistance of 100 ohm. The difference of potential between two points on the wire separated by a distance of 50 cm will be [AIPMT 2004]

(1) 2 volt (2) 3 volt (3) 1 volt (4) 1.5 volt

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Q.98 When three identical bulbs of 60 watt, 200 volt rating are connected in series to a 200 volt supply, the power drawn by them will be [AIPMT 2004]

(1) 60 watt (2) 180 watt

(3) 10 watt (4) 20 watt

Scan or tap for the full solution

Q.99 In India electricity is supplied for domestic use at 220 V. It is supplied at 110 V in USA. If the resistance of a 60 W bulb for use in India is R, the resistance of a 60 W bulb for use in USA will be [AIPMT 2004]

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

Scan or tap for the full solution

Q.100 In a Wheatstone's bridge all the four arms have equal resistance R. If the resistance of the galvanometer arm is also R, the equivalent resistance of the combination as seen by the battery is [AIPMT 2003]

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

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Q.101 Two 220 volt, 100 watt bulbs are connected first in series and then in parallel. Each time the combination is connected to a 220 volt a.c. supply line. The power drawn by the combination in each case respectively will be [AIPMT 2003]

(1) 50 watt, 100 watt (2) 100 watt, 50 watt
(3) 200 watt, 150 watt (4) 50 watt, 200 watt

Scan or tap for the full solution

Q.102 An electric kettle has two heating coils. When one of the coils is connected to an a.c. source, the water in the kettle boils in 10 minutes. When the other coil is used the water boils in 40 minutes. If both the coils are connected in parallel, the time taken by the same quantity of water to boil will be [AIPMT 2003]

(1) 8 minutes (2) 4 minutes
(3) 25 minutes (4) 15 minutes

Scan or tap for the full solution

Q.103 Fuse wire is a wire of [AIPMT 2003]

(1) high resistance and high melting point
(2) high resistance and low melting point
(3) low resistance and low melting point
(4) low resistance and high melting point

Scan or tap for the full solution

Q.104 For a cell terminal potential difference is 2.2 V when circuit is open and reduces to 1.8 V when cell is connected to a resistance of R = 5 Ω. Determine internal resistance of cell (r) [AIPMT 2002]

(1) $\frac{10}{9}$ Ω (2) $\frac{9}{10}$ Ω (3) $\frac{11}{9}$ Ω (4) $\frac{5}{9}$ Ω

Scan or tap for the full solution

Q.105 Specific resistance of a conductor increases with [AIPMT 2002]

(1) increase in temperature
(2) increase in cross-section area
(3) increase in cross-section and decrease in length
(4) decrease in cross-section area.

Scan or tap for the full solution

Q.106 Copper and silicon are cooled from 300 K to 60 K, the specific resistance [AIPMT 2001]

(1) decrease in copper but increase in silicon
(2) increase in copper but decrease in silicon
(3) increase in both
(4) decrease in both

Scan or tap for the full solution

Q.107 The resistance of each arm of the Wheatstone's bridge is 10 ohm. A resistance of 10 ohm is connected in series with a galvanometer then the equivalent resistance across the battery will be [AIPMT 2001]

(1) 10 ohm (2) 15 ohm (3) 20 ohm (4) 40 ohm

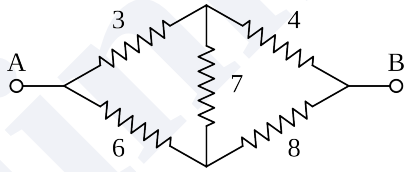
Scan or tap for the full solution

Q.108 If specific resistance of a potentiometer wire is 10^{-7} Ω m and current flow through it is 0.1 amp., cross-sectional area of wire is 10^{-6} m^2 then potential gradient will be [AIPMT 2001]

(1) 10^{-2} volt/m (2) 10^{-4} volt/m (3) 10^{-6} volt/m (4) 10^{-8} volt/m

Scan or tap for the full solution

Q.109 The net resistance of the circuit between A and B is [AIPMT 2000]



(1) $\frac{8}{3}$ Ω (2) $\frac{14}{3}$ Ω (3) $\frac{16}{3}$ Ω (4) $\frac{22}{3}$ Ω

Scan or tap for the full solution

Q.110 A car battery of emf 12 V and internal resistance 5×10^{-2} Ω, receives a current of 60 amp, from external source, then terminal potential difference of battery is [AIPMT 2000]

(1) 12 V (2) 9 V (3) 15 V (4) 20 V

Scan or tap for the full solution

Q.111 Two bulbs of (40 W, 200 V), and (100 W, 200 V). Then correct relation for their resistances [AIPMT 2000]

(1) $R_{40} < R_{100}$
(2) $R_{40} > R_{100}$
(3) $R_{40} = R_{100}$
(4) no relation can be predicted.

Solution

Q.112 The potentiometer is best for measuring voltage, as [AIPMT 2000]

(1) it has a sensitive galvanometer and gives null deflection
(2) it has wire of high resistance
(3) it measures p.d. in closed circuit
(4) it measures p.d. in open circuit.

Solution

ANSWER KEY

Ques.	1	2	3	4	5	6	7
Ans.	**3**	**4**	**4**	**4**	**2**	**4**	**1**
Ques.	8	9	10	11	12	13	14
Ans.	**4**	**3**	**2**	**2**	**1**	**2**	**1**
Ques.	15	16	17	18	19	20	21
Ans.	**4**	**3**	**1**	**2**	**2**	**2**	**1**
Ques.	22	23	24	25	26	27	28
Ans.	**3**	**2**	**4**	**2**	**1**	**2**	**4**
Ques.	29	30	31	32	33	34	35
Ans.	**2**	**2**	**1**	**2**	**3**	**1**	**3**
Ques.	36	37	38	39	40	41	42
Ans.	**1**	**2**	**3**	**4**	**2**	**1**	**1**
Ques.	43	44	45	46	47	48	49
Ans.	**1**	**2**	**2**	**2**	**2**	**3**	**4**
Ques.	50	51	52	53	54	55	56
Ans.	**3**	**3**	**4**	**3**	**4**	**3**	**2**
Ques.	57	58	59	60	61	62	63
Ans.	**2**	**3**	**4**	**4**	**2**	**4**	**2**
Ques.	64	65	66	67	68	69	70
Ans.	**1**	**3**	**3**	**2**	**4**	**3**	**1**
Ques.	71	72	73	74	75	76	77
Ans.	**2**	**3**	**4**	**2**	**4**	**4**	**1**
Ques.	78	79	80	81	82	83	84
Ans.	**3**	**2**	**4**	**3**	**3**	**2**	**1**
Ques.	85	86	87	88	89	90	91
Ans.	**2**	**1**	**3**	**2**	**1**	**4**	**1**
Ques.	92	93	94	95	96	97	98
Ans.	**4**	**1**	**2**	**1**	**3**	**3**	**4**
Ques.	99	100	101	102	103	104	105
Ans.	**3**	**3**	**4**	**1**	**2**	**1**	**1**
Ques.	106	107	108	109	110	111	112
Ans.	**1**	**1**	**1**	**2**	**3**	**2**	**1**

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