NDA-CDS 1 2025

GS

LIVE

PHYSICS

ELECTRICITY

CLASS 3

NAVJYOTI SIR

SSBCrack EXAMS

ELECTRICITY - MCQs

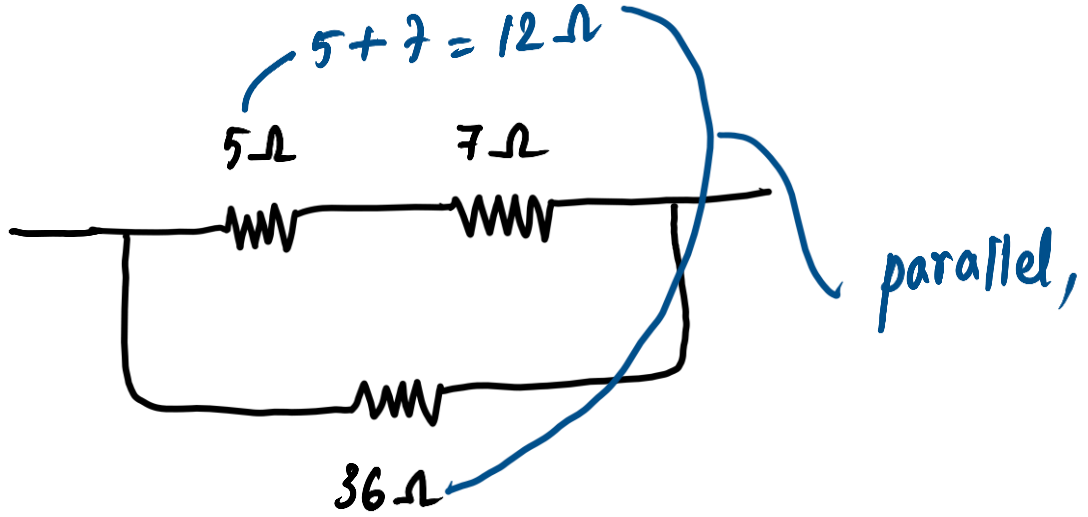
Two resistances of 5·0 Ω and 7·0 Ω are connected in series and the combination is connected in parallel with a resistance of 36·0 Ω. The equivalent resistance of the combination of three resistors is

(a) 24·0 Ω

(b) 12·0 Ω

(c) 9·0 Ω

(d) 6·0 Ω



$$R = \frac{R_1 R_2}{R_1 + R_2} = \frac{12 \times 36}{12 + 36} = \frac{12 \times 36^{9}}{48_{4}} = 9\,\Omega$$

Two resistances of 5·0 Ω and 7·0 Ω are connected in series and the combination is connected in parallel with a resistance of 36·0 Ω. The equivalent resistance of the combination of three resistors is

(a) 24·0 Ω

(b) 12·0 Ω

(c) 9·0 Ω

(d) 6·0 Ω

ANS : C

Lightning is due to

(a) The flow of charges between different parts of the cloud ✗

(b) The short-circuiting of charges between the upper and lower surfaces of the cloud ✗

(c) The collection of positively charged particles on the base and collection of negatively charged particles at the top of the cloud ✗

(d) The induction of positive charge on the ground below the negative charge at the base of the cloud ✓

process of polarising → INDUCTION

Lightning is due to

(a) The flow of charges between different parts of the cloud

(b) The short-circuiting of charges between the upper and lower surfaces of the cloud

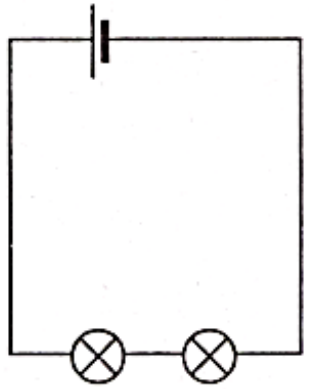
(c) The collection of positively charged particles on the base and collection of negatively charged particles at the top of the cloud

(d) The induction of positive charge on the ground below the negative charge at the base of the cloud

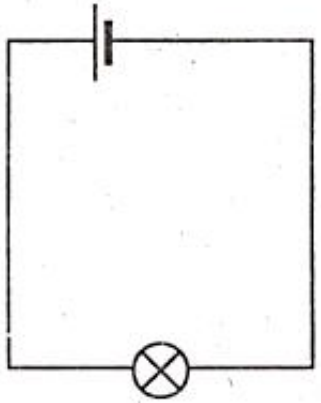
ANS : D

In which one among the following situations, the bulb ⊗ would glow the most ? (Consider all batteries are the same)

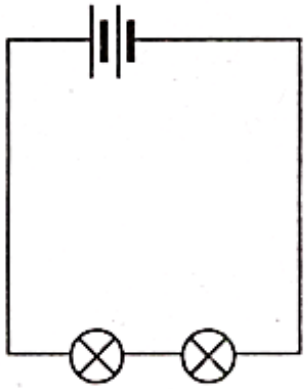
(a)



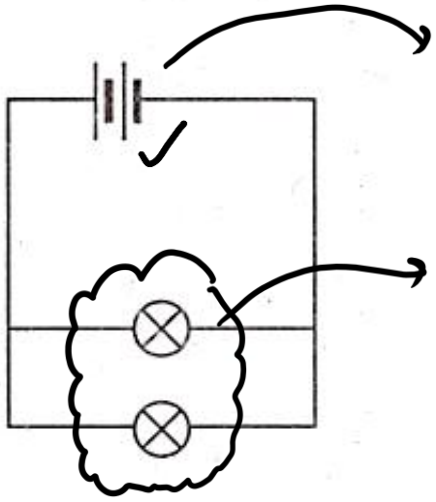
(c)



(b)



(d)



bulb glowing most

⇓

maximum current

more voltage ⇒ more current (ohm's law)

connected in parallel ⇒ Overall resistance is lowest

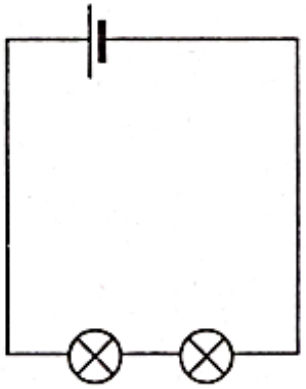
⇒ max. current

current $\propto$ voltage (directly related)

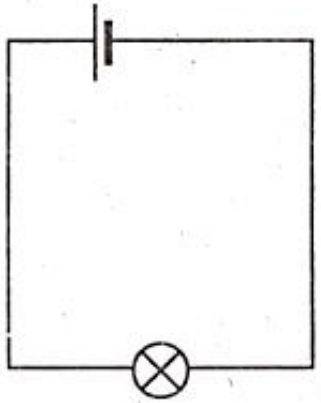
current $\propto \frac{1}{\text{resistance}}$ (inversely related)

In which one among the following situations, the bulb ⊗ would glow the most ? (Consider all batteries are the same)

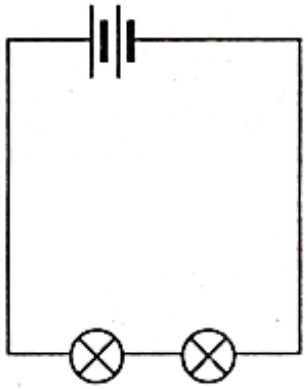
(a)



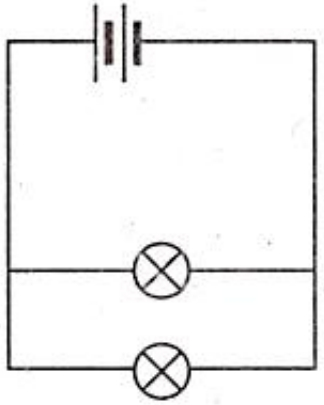
(c)



(b)

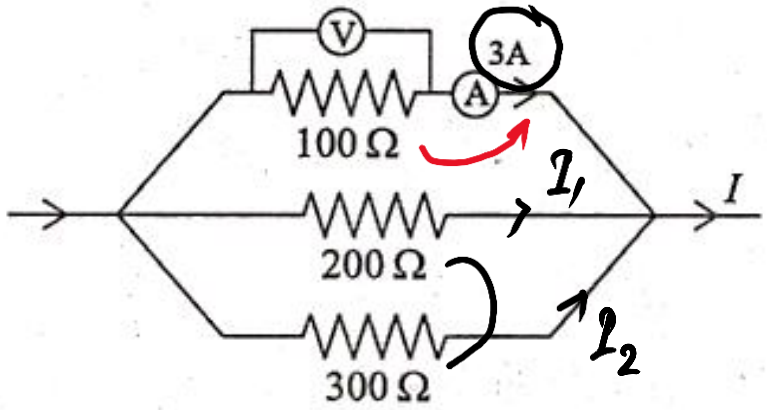


(d)



ANS : D

For an electric circuit given below, the correct combination of voltage (V) and current (I) is



(a) $V = 900$ V; $I = 18$ A

(b) $V = 300$ V; $I = 5{\cdot}5$ A

(c) $V = 600$ V; $I = 1$ A

(d) $V = 300$ V; $I = 2$ A

$V = 3A \times 100\,\Omega = 300\ V$

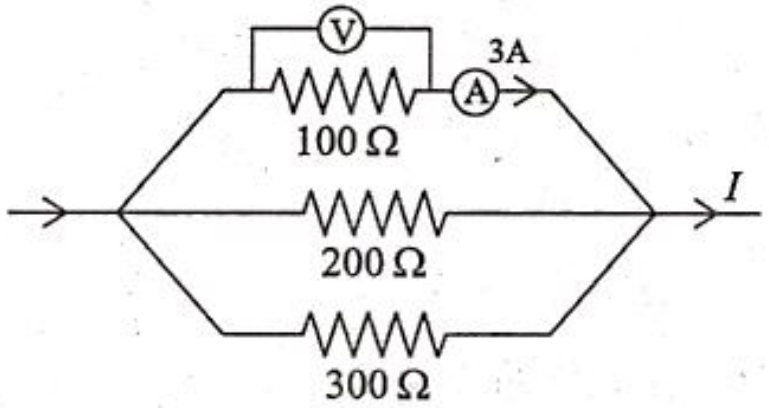
$100\,\Omega$, $200\,\Omega$ & $300\,\Omega$ ⟶ same voltage (parallel connection)

$I = I_1 + I_2 + 3A$

$I_1 = \frac{300\,V}{200\,\Omega} = 1{\cdot}5\,A$; $I_2 = \frac{300\,V}{300\,\Omega} = 1\,A$

$I = 1{\cdot}5 + 1 + 3 = 5{\cdot}5\,A$

For an electric circuit given below, the correct combination of voltage (V) and current (I) is



(a) $V = 900$ V; $I = 18$ A

(b) $V = 300$ V; $I = 5{\cdot}5$ A

(c) $V = 600$ V; $I = 1$ A

(d) $V = 300$ V; $I = 2$ A

ANS : B

An incandescent electric bulb converts 20% of its power consumption into light, and the remaining power is dissipated as heat. The bulb's filament has a resistance of 200 Ω and 2 A current flows through it. If the bulb remains ON for 10 h and the rate of electricity charge is ₹5/unit, then which among the following is the correct amount for the money spent on producing light ?

(a) ₹5

(b) ₹6

(c) ₹7

(d) ₹8

$I = 2A$; $R = 200\ \Omega$

Power (100%) $= I^2R = 2^2 \times 200$

$= 800$ watt

$= \frac{800}{1000} = 0.8$ kw

Light producing (20%) $= \frac{20}{100} \times 0.8 = 0.16$ kw

Energy $= 0.16 \times 10\ h = 1.6$ kwh $= 1.6$ units.

Cost $= 1.6$ unit $\times$ ₹5/unit $=$ ₹8

An incandescent electric bulb converts 20% of its power consumption into light, and the remaining power is dissipated as heat. The bulb's filament has a resistance of 200 Ω and 2 A current flows through it. If the bulb remains ON for 10 h and the rate of electricity charge is ₹5/unit, then which among the following is the correct amount for the money spent on producing light ?

(a) ₹5

(b) ₹6

(c) ₹7

(d) ₹8

ANS : D

The AC mains domestic supply current in India changes direction in every

(a) 50 s

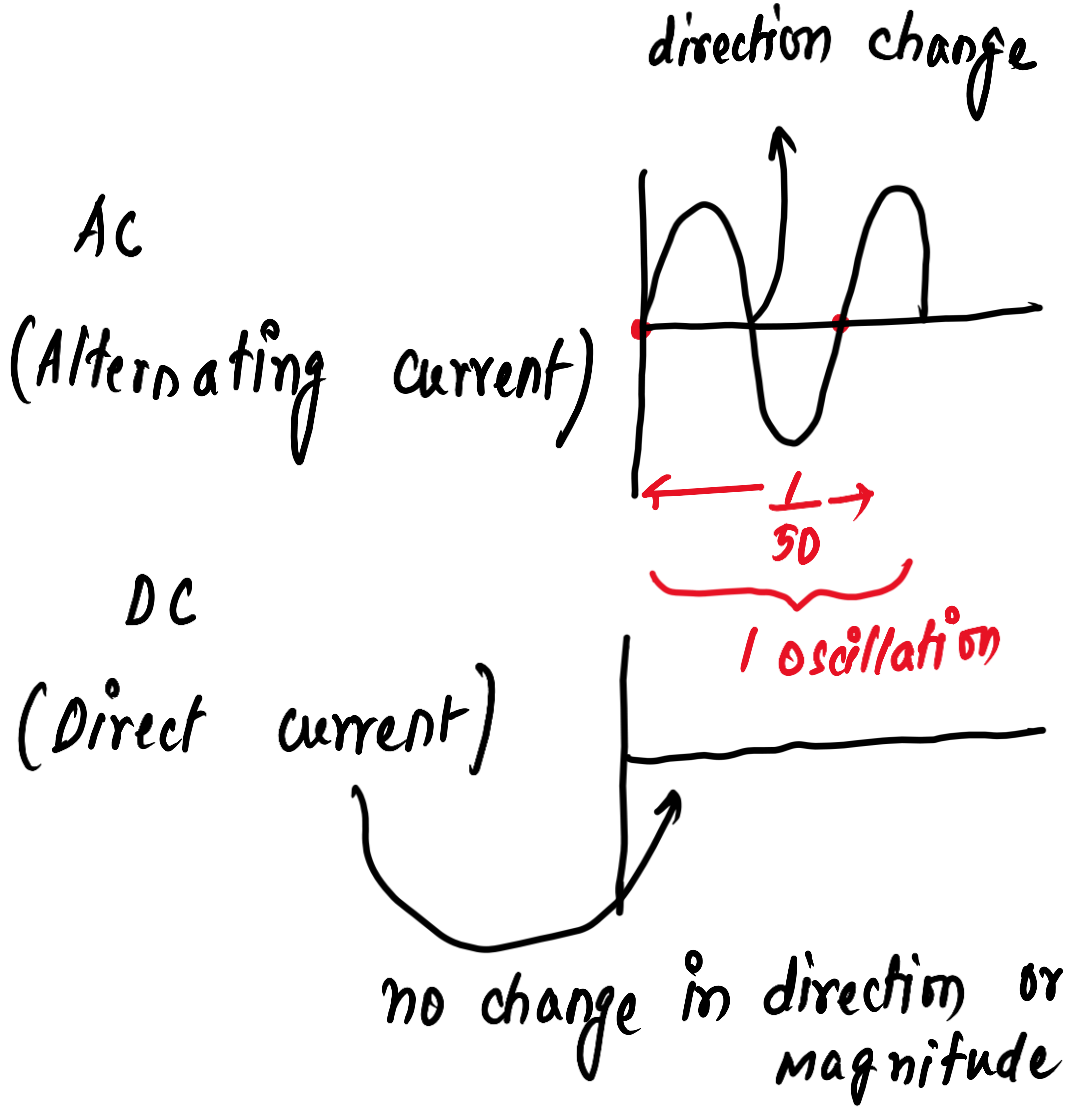
(b) $\frac{1}{50}$ s

(c) 100 s

(d) $\frac{1}{100}$ s

frequency = 50 Hz = $\frac{1}{50\ s}$

$\frac{1}{2}\left(\frac{1}{50}\right) = \frac{1}{100}\ s$



The AC mains domestic supply current in India changes direction in every

(a) 50 s

(b) $\frac{1}{50}$ s

(c) 100 s

(d) $\frac{1}{100}$ s

ANS : D

Which one of the following is primarily responsible for conduction of current in a metal ?

(a) Bound electrons

(b) Free electrons ✓

(c) Both bound and free electrons

(d) Ions

Which one of the following is primarily responsible for conduction of current in a metal ?

(a) Bound electrons

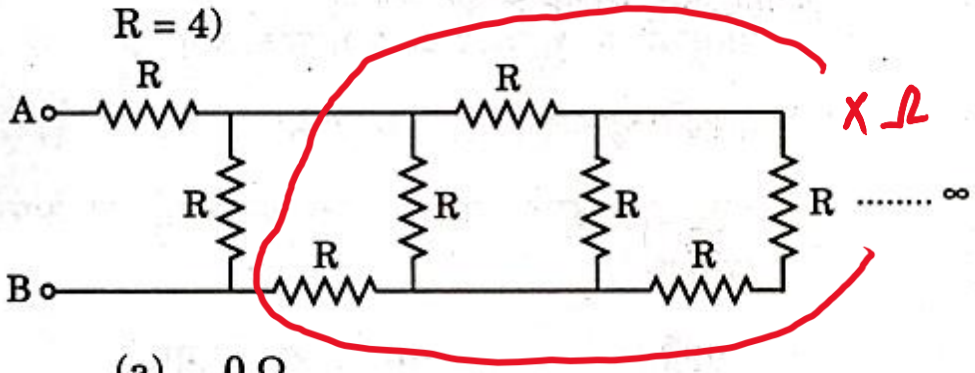
(b) Free electrons

(c) Both bound and free electrons

(d) Ions

ANS : B

An infinite combination of resistors, having resistance R = 4 Ω, is given below. What is the net resistance between the points A and B ? (Each resistance is of equal value, R = 4)



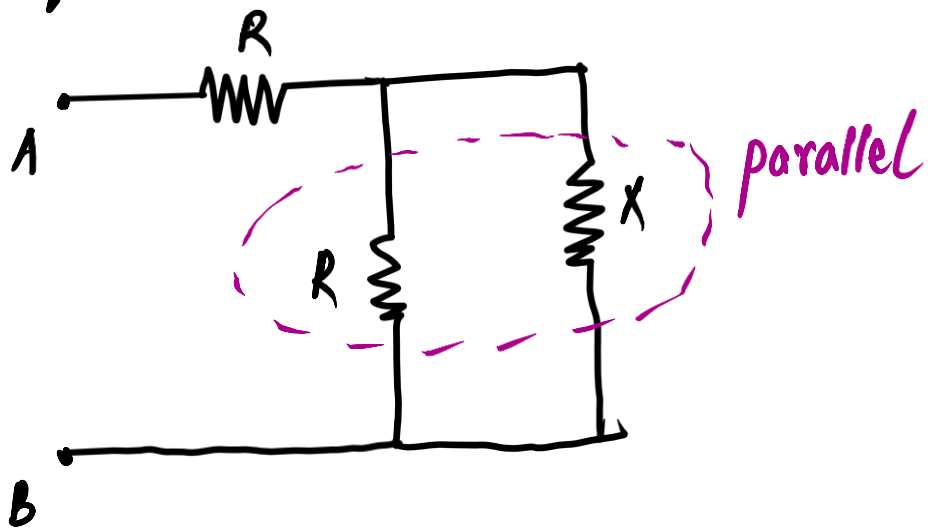
(a) 0 Ω

(b) $2+2\sqrt{5}$ Ω

(c) $2+\sqrt{5}$ Ω

(d) ∞ Ω

Equivalent resistance



$$X = \frac{RX}{R+X} + R$$

$$X = \frac{4X}{4+X} + 4$$

$$4X + X^2 = 4X + 16 + 4X$$

$$X^2 - 4X - 16 = 0$$

$$x^2 - 4x - 16 = 0$$

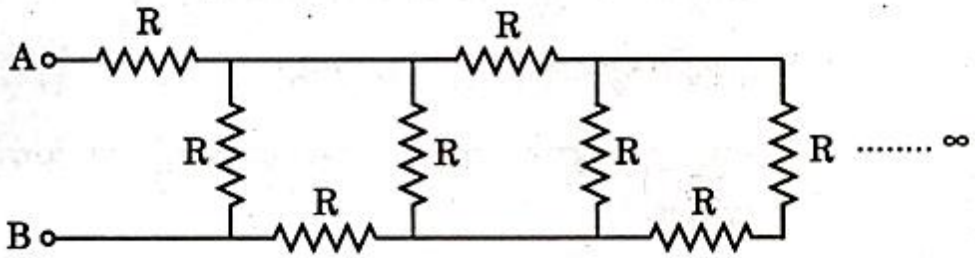
$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4 \times 1 \times -16}}{2 \times 1}$$

$$= \frac{4 \pm \sqrt{16 + 64}}{2} = \frac{4 \pm \sqrt{80}}{2}$$

$$= \frac{4 \pm 4\sqrt{5}}{2} = \begin{cases} 2 + 2\sqrt{5} \\ 2 - 2\sqrt{5} \ (-ve \rightarrow \text{rejected}) \end{cases}$$

$x = 2 + 2\sqrt{5}\ \Omega$

An infinite combination of resistors, having resistance R = 4 Ω, is given belo What is the net resistance between the points A and B ? (Each resistance is of equal value, R = 4)



(a) 0 Ω

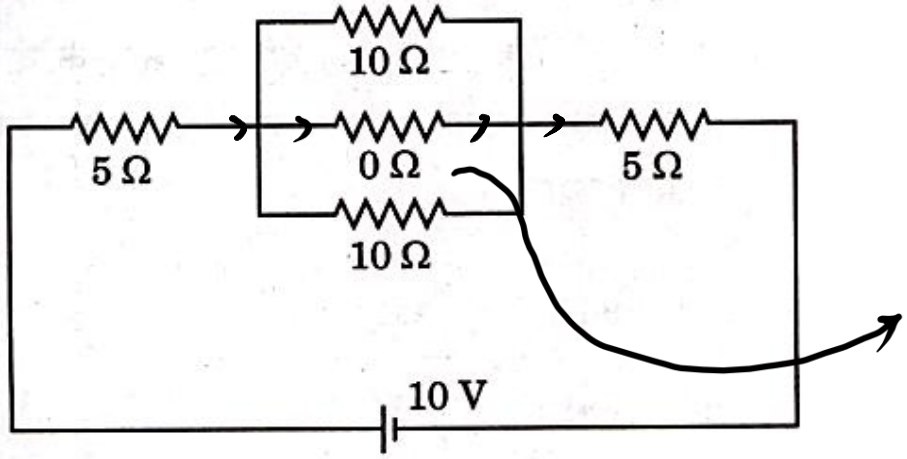
(b) $2+2\sqrt{5}$ Ω

(c) $2+\sqrt{5}$ Ω

(d) ∞ Ω

Answer: (B)

Consider the following electric circuit :



The current in the above electric circuit is :

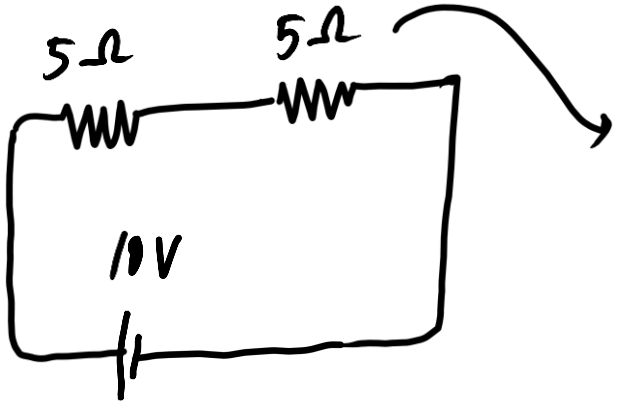
(a) 1 A

(b) (10/15) A

(c) 2 A

(d) 1·5 A

current passes through path of zero resistance,

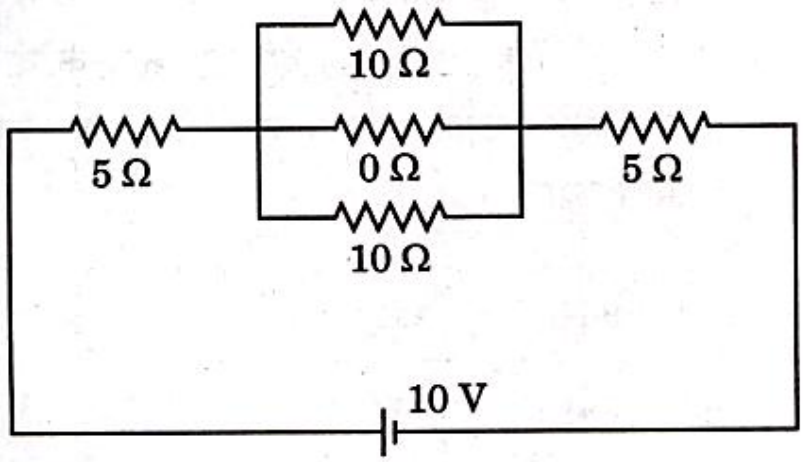


equivalent resistance,

$5\,\Omega + 5\,\Omega = 10\,\Omega$

$I = \frac{10\,V}{10\,\Omega} = 1\,A$

Consider the following electric circuit :



The current in the above electric circuit is :

(a) 1 A

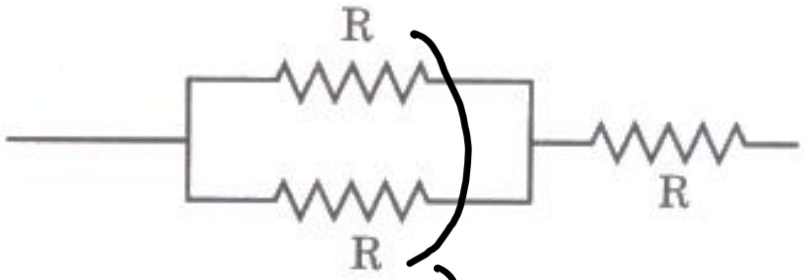
(b) (10/15) A

(c) 2 A

(d) 1·5 A

Answer: (A)

What is the total resistance in the following circuit element ?



(a) R/2

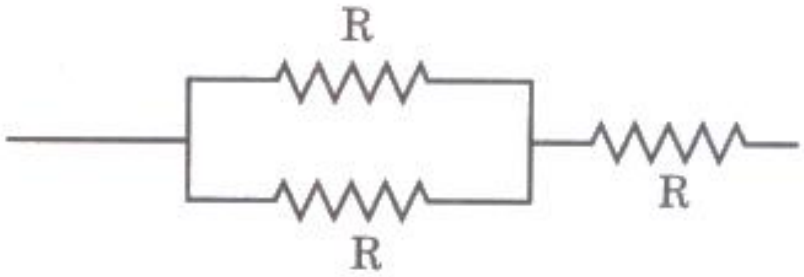
(b) 3R

(c) 3R/2

(d) 2R/3

$$\frac{R}{2} + R = \frac{3R}{2}$$

What is the total resistance in the following circuit element ?



(a) R/2

(b) 3R

(c) 3R/2

(d) 2R/3

Answer: (C)

The cost of energy to operate an industrial refrigerator that consumes 5 kW power working 10 hours per day for 30 days will be
(Given that the charge per kW.h of energy = ₹ 4)

(a) ₹ 600

(b) ₹ 6,000

(c) ₹ 1,200

(d) ₹ 1,500

$5 \times 10 \times 30 = 1500$ kwh

Cost $= 4 \times 1500$

$= ₹\ 6000$

The cost of energy to operate an industrial refrigerator that consumes 5 kW power working 10 hours per day for 30 days will be
(Given that the charge per kW.h of energy = ₹ 4)

(a) ₹ 600

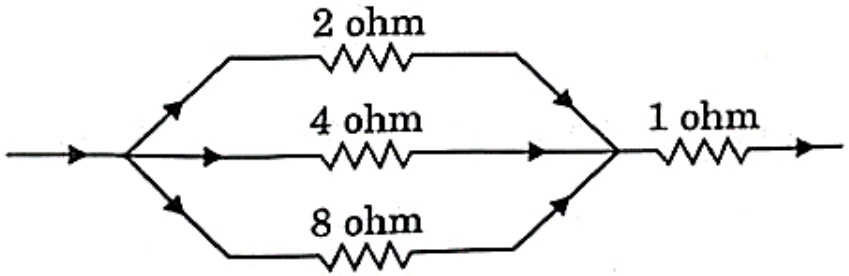
(b) ₹ 6,000

(c) ₹ 1,200

(d) ₹ 1,500

Answer: (B)

Consider the following part of an electric circuit :



The total electrical resistance in the given part of the electric circuit is

(a) $\frac{15}{8}$ ohm

(b) $\frac{15}{7}$ ohm

(c) 15 ohm

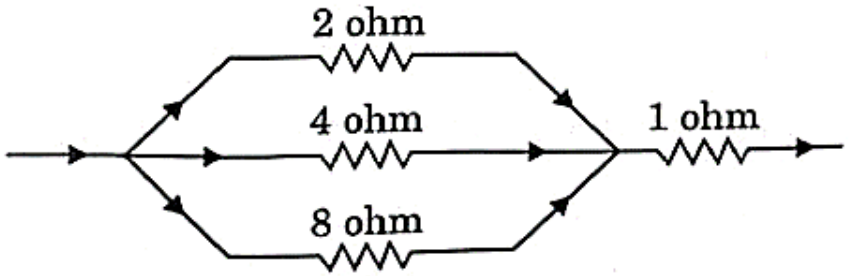
(d) $\frac{17}{3}$ ohm

2, 4 and 8 Ω are in parallel,

$\frac{1}{R_p} = \frac{1}{2} + \frac{1}{4} + \frac{1}{8} \Rightarrow R_p = \frac{8}{4+2+1} = \frac{8}{7}\ \Omega$

total resistance $= \frac{8}{7} + 1 = \frac{15}{7}\ \Omega$

Consider the following part of an electric circuit :



The total electrical resistance in the given part of the electric circuit is

(a) $\frac{15}{8}$ ohm

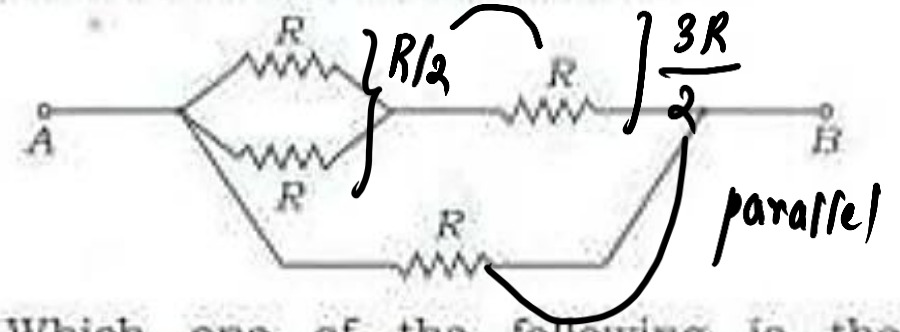
(b) $\frac{15}{7}$ ohm

(c) 15 ohm

(d) $\frac{17}{3}$ ohm

Answer: (B)

Consider the following circuit :



Which one of the following is the value of the resistance between points A and B in the circuit given above?

(a) $\frac{2}{5}R$

(b) $\frac{3}{5}R$

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

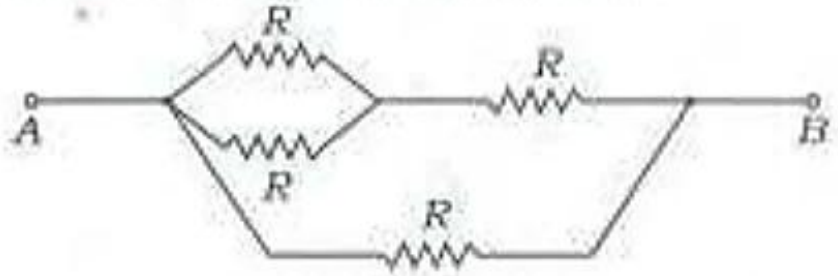
(d) $4R$

$$\frac{\frac{3R}{2} \times R}{\frac{3R}{2} + R}$$

$$= \frac{3R^2}{2} \times \frac{2}{5R}$$

$$= \frac{3}{5}R$$

Consider the following circuit :



Which one of the following is the value of the resistance between points A and B in the circuit given above?

(a) $\frac{2}{5}R$

(b) $\frac{3}{5}R$

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

(d) $4R$

Answer: (B)

Which one of the following is the value of 1 kWh of energy converted into joules ?

(a) $1{\cdot}8 \times 10^6$ J

(b) $3{\cdot}6 \times 10^6$ J

(c) $6{\cdot}0 \times 10^6$ J

(d) $7{\cdot}2 \times 10^6$ J

$1\ kwh = 1\ kW \times 1\ h$

$= 1000\ \underline{W} \times 3600\ \underline{s}$

$= 3.6 \times 10^6\ J$

$\text{Power} = \frac{\text{Energy}}{\text{Time}}$ (Energy: J; Power: Watt (W); Time: Second (s))

Which one of the following is the value of 1 kWh of energy converted into joules ?

(a) $1{\cdot}8 \times 10^6$ J

(b) $3{\cdot}6 \times 10^6$ J

(c) $6{\cdot}0 \times 10^6$ J

(d) $7{\cdot}2 \times 10^6$ J

Answer: (B)

Which one of the following devices is non-ohmic ?

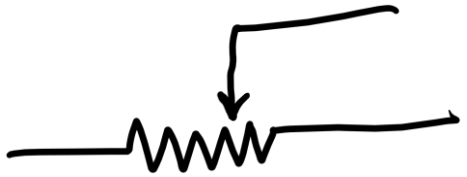
(a) Conducting copper coil

(b) Electric heating coil

(c) Semi conductor diode

(d) Rheostat

variable resistance



Which one of the following devices is non-ohmic ?

(a) Conducting copper coil

(b) Electric heating coil

(c) Semi conductor diode

(d) Rheostat

Answer: (C)

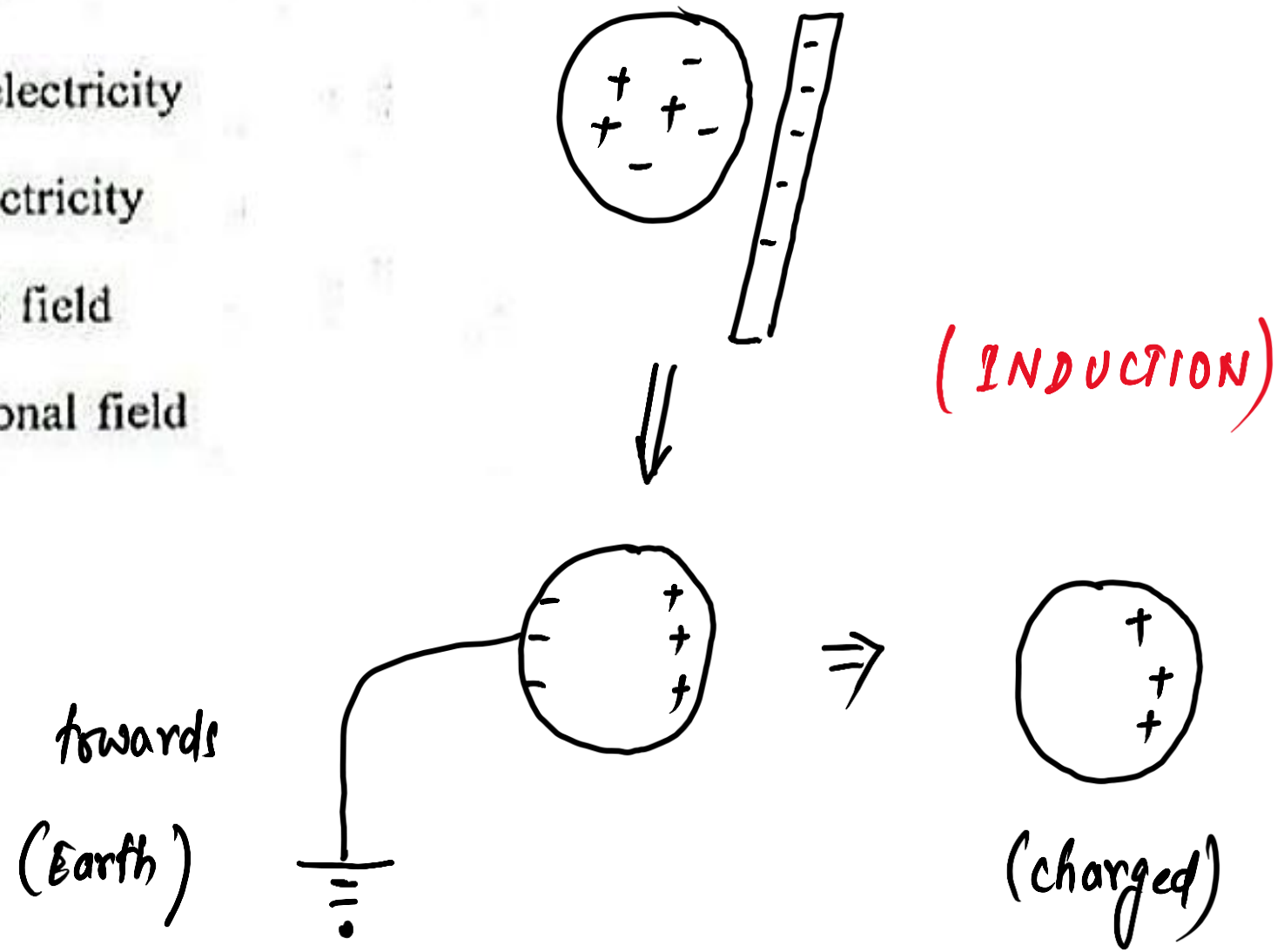
Which one of the following can charge an insulator ?

(a) Current electricity

(b) Static electricity

(c) Magnetic field

(d) Gravitational field



Which one of the following can charge an insulator ?

(a) Current electricity

(b) Static electricity

(c) Magnetic field

(d) Gravitational field

Answer: (B)

A current of 1·0 A is drawn by a filament of an electric bulb for 10 minutes. The amount of electric charge that flows through the circuit is

(a) 0·1 C

(b) 10 C

(c) 600 C

(d) 800 C

$$\text{Current } (I) = \frac{\text{charge } (Q)}{\text{Time } (t)}$$

Coulombs (C)

seconds

Amperes (A)

$$Q = I \times t$$

$$= 1 \times (10 \times 60)$$

$$= 600 \text{ C}$$

A current of 1·0 A is drawn by a filament of an electric bulb for 10 minutes. The amount of electric charge that flows through the circuit is

(a) 0·1 C

(b) 10 C

(c) 600 C

(d) 800 C

Answer: (C)

Which one of the following correctly represents the SI unit of resistivity?

(a) Ω

(b) Ω/m

(c) Ω cm

(d) Ω m

Resistance,

$$R = \frac{\rho l}{A}$$

$$\rho = \frac{RA}{l} \qquad \frac{\Omega \cdot m^2}{m} = \Omega m$$

Which one of the following correctly represents the SI unit of resistivity?

(a) Ω

(b) Ω / m

(c) Ω cm

(d) Ω m

Answer: (D)

Which one of the following formulas does ***not*** represent electrical power ?

(a) $I^2 R$

(b) $I R^2$

(c) $V I$

(d) V^2 / R

$P = VI$ ——— (1)

$= V\left(\frac{V}{R}\right) = \frac{V^2}{R}$ — (2)

$= (IR)\, I = I^2 R$ — (3)

Which one of the following formulas does ***not*** represent electrical power ?

(a) $I^2 R$

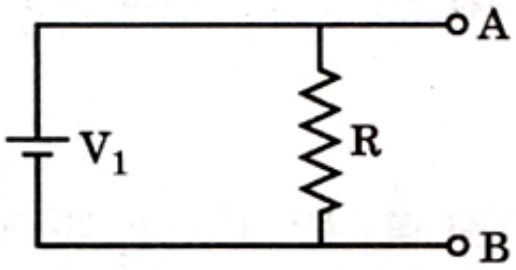
(b) $I R^2$

(c) $V I$

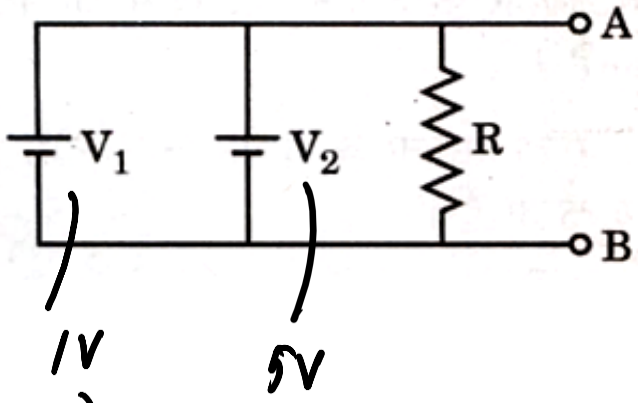
(d) V^2 / R

Answer: (B)

An electric circuit is given below. $V_1 = 1$ V and Resistance R = 1000 Ω.



The current through the resistance R is very close to 1 mA and the voltage across point A and B, $V_{AB} = 1$ V. Now the circuit is changed to :



$r_1 = r_2 = 0.1\ \Omega$

where value of $V_2 = 5$ V. The internal resistances of both the batteries are 0·1 Ω. The current through the resistance R is about :

(a) 1·0 mA

(b) 1·2 mA

(c) 3·0 mA

(d) 5·0 mA

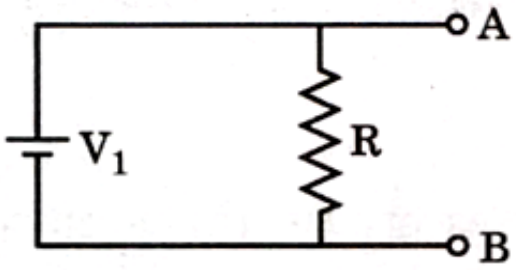
equivalent emf,

$$V = \frac{\frac{V_1}{r_1} + \frac{V_2}{r_2}}{\frac{1}{r_1} + \frac{1}{r_2}} = \frac{\frac{1}{0.1} + \frac{5}{0.1}}{\frac{1}{0.1} + \frac{1}{0.1}}$$

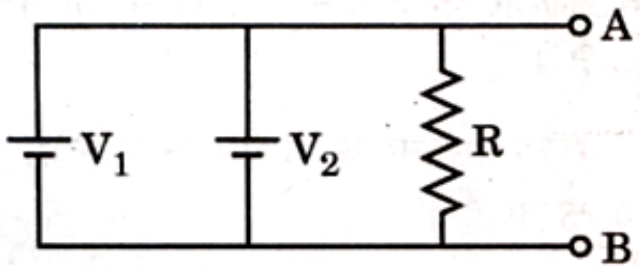
$V = 3$ V

$$I = \frac{3}{1000} = 3\ \text{mA}$$

An electric circuit is given below. $V_1 = 1$ V and Resistance R = 1000 Ω.



The current through the resistance R is very close to 1 mA and the voltage across point A and B, $V_{AB} = 1$ V. Now the circuit is changed to :



where value of $V_2 = 5$ V. The internal resistances of both the batteries are 0·1 Ω. The current through the resistance R is about :

(a) 1·0 mA

(b) 1·2 mA

(c) 3·0 mA

(d) 5·0 mA

ANS : C

An electric wire of resistance 50 ohm is cut into five equal wires. These wires are then connected in parallel. What is the equivalent resistance of this combination ?

A. 2 ohms

B. 10 ohms

C. 0.5 ohms

D. 5 ohms

$R = \frac{\rho l}{A}$; if ρ and A are same (as the wire is cut)

$R \propto l$

$\frac{50}{5} = 10\,\Omega$ → each resistance,

equivalent resistance $= \frac{10}{5} = 2\,\Omega$

An electric wire of resistance 50 ohm is cut into five equal wires. These wires are then connected in parallel. What is the equivalent resistance of this combination ?

A. 2 ohms

B. 10 ohms

C. 0.5 ohms

D. 5 ohms

An electric bulb is connected to 220 V generator. The current drawn is 600 mA. What is the power of the bulb ?

A. 132 W

B. 13.2 W

C. 1320 W

D. 13200 W

$$P = VI$$

$$= (220\,V)\left(\frac{600}{1000}\,A\right)$$

$$= 22 \times 6 = 132\,W$$

An electric bulb is connected to 220 V generator. The current drawn is 600 mA. What is the power of the bulb ?

A. **132 W**

B. 13.2 W

C. 1320 W

D. 13200 W

Which statements are correct about a wire's electrical resistance and resistivity ?

1. **Both quantities depend on the area of cross-section of the wire.** ✗
2. **Both depend on the temperature.** ✓
3. **Resistance of the wire is directly proportional to the resistivity of the wire.** ✓
4. **Resistivity of the wire is directly proportional to the length of the wire.** ✗

Select the correct option :

A. 1 and 2

B. 2 only

C. 2 and 3 only

D. None of these

R (Resistance)

→ Length

→ Area of cross section

→ resistivity

→ Temperature

Resistivity

→ Temperature

→ Nature of material,

Which statements are correct about a wire's electrical resistance and resistivity ?

1. **Both quantities depend on the area of cross-section of the wire.**
2. **Both depend on the temperature.**
3. **Resistance of the wire is directly proportional to the resistivity of the wire.**
4. **Resistivity of the wire is directly proportional to the length of the wire.**

Select the correct option :

A. 1 and 2

B. 2 only

C. 2 and 3 only

D. None of these

Two metaliic wires A and B are made using copper. The radius of wire A is r while its length is l. A dc voltage V is applied across the wire A, causing power dissipation P. The radius of wire B is 2r and its length is 2l and the same dc voltage V is applied across it causing power dissipation P_1. Which of the following is the correct relationship between P and P_1 ?

A. $P = 2P_1$

B. $P = P_1 / 2$

C. $P = 4P_1$

D. $P = P_1$

$\text{Power } (P) = \frac{V^2}{R} \Rightarrow \frac{P}{P_1} = \frac{V^2/R}{V^2/R_1} = \frac{R_1}{R} = \frac{1}{2}$

$\frac{P}{P_1} = \frac{1}{2}$

$P = \frac{P_1}{2}$

$R_1 = \frac{\rho(2l)}{\pi(2r)^2} = \frac{2\rho l}{4\pi r^2}$ (wire B)

$= \frac{1}{2}\frac{\rho l}{\pi r^2}$

(A & B are of copper $\Rightarrow \rho$ = same)

$R = \frac{\rho l}{\pi r^2} =$ (wire A)

$R_1 = \frac{1}{2}R \Rightarrow \frac{R_1}{R} = \frac{1}{2}$

Two metaliic wires A and B are made using copper. The radius of wire A is r while its length is l. A dc voltage V is applied across the wire A, causing power dissipation P. The radius of wire B is 2r and its length is 2l and the same dc voltage V is applied across it causing power dissipation P_1. Which of the following is the correct relationship between P and P_1 ?

A. $P = 2P_1$

B. $P = P_1 / 2$

C. $P = 4P_1$

D. $P = P_1$

The graphs between current (I) and Voltage (V) for three linear resistors 1, 2, and 3 are given below :

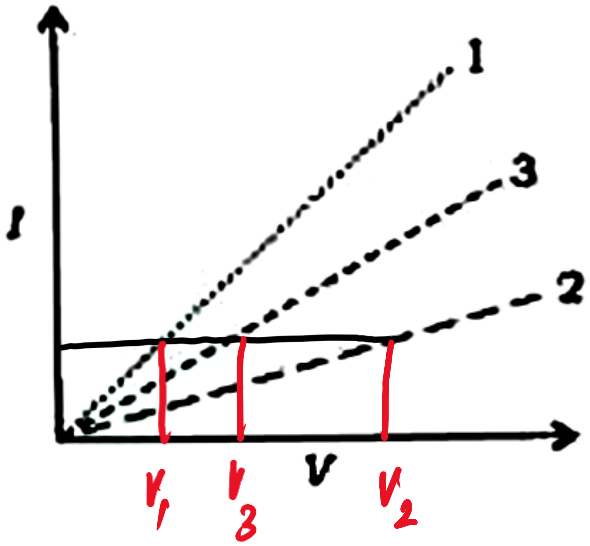
If R1, R2 and R3 are the resistances of these resistors , then which one of the following is correct ?

A. R1 > R2 > R3

B. R1 < R3 < R2

C. R3 < R1 < R2

D. R3 > R2 > R1



$$R = \frac{V}{I}$$

for same I, $R \propto V$,

$V_1 < V_3 < V_2$

$R_1 < R_3 < R_2$

The graphs between current (I) and Voltage (V) for three linear resistors 1, 2, and 3 are given below :

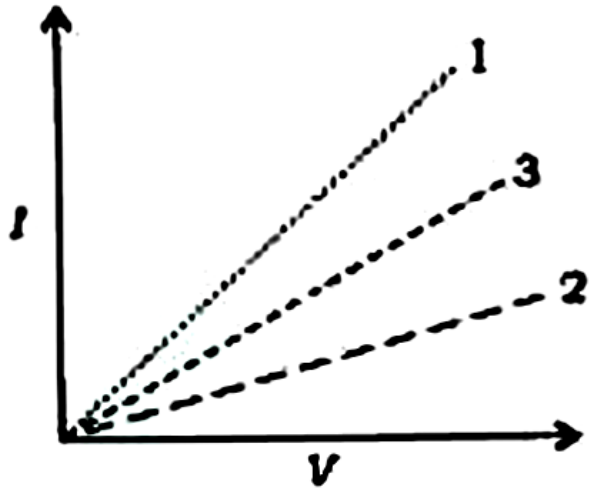
If R1, R2 and R3 are the resistances of these resistors , then which one of the following is correct ?

A. R1 > R2 > R3

B. R1 < R3 < R2

C. R3 < R1 < R2

D. R3 > R2 > R1



Water is heated with a coil of resistance R connected to the domestic supply. The rise of the temperature of water will depend on

1. Supply Voltage. ✗

2. Current passing through the coil. ✓

3. Time for which voltage is supplied. ✓

Which statements are correct ?

A. 1, 2 and 3

B. 1 and 2 only

C. 1 only

D. 2 and 3 only

Heat results in rise in temperature.

$H = I^2Rt$ (Joule's law of Heating)

I → Current

R → Resistance

t → Time

Water is heated with a coil of resistance R connected to the domestic supply. The rise of the temperature of water will depend on

1. Supply Voltage.

2. Current passing through the coil.

3. Time for which voltage is supplied.

Which statements are correct ?

A. 1, 2 and 3

B. 1 and 2 only

C. 1 only

D. 2 and 3 only

Which of the following statements correctly explains/explain the existence of a positive force between two electric charges?

1. **Both the charges are positive.**
2. **Both the charges are negative.**
3. **Both the charges are oppositely charged.**

Select the correct option :

A. 1 only

B. 2 only

C. 1 and 2 only

D. 1, 2 and 3

$$F = \frac{k q_1 q_2}{r^2}$$

$F > 0 \Rightarrow q_1 q_2 > 0$

(repulsive)

$q_1, q_2 > 0$ $\quad$ $q_1, q_2 < 0$

(Like charges)

Which of the following statements correctly explains/explain the existence of a positive force between two electric charges?

1. Both the charges are positive.

2. Both the charges are negative.

3. Both the charges are oppositely charged.

Select the correct option :

A. 1 only

B. 2 only

C. 1 and 2 only

D. 1, 2 and 3

A fuse wire must be

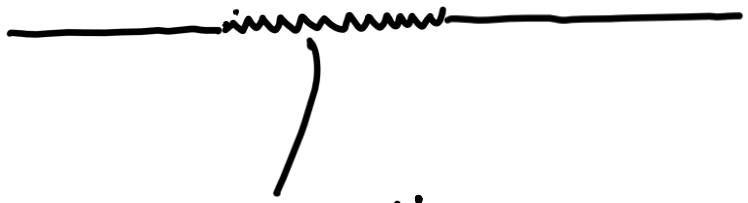
A. conducting and of low melting point

B. conducting and of high melting point

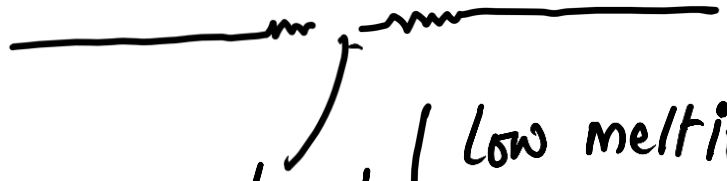
C. insulator and of high melting point

D. insulator and of low melting point

(Till max. value rated on fuse, current should pass through fuse



conducting



break by melting | Low melting point

A fuse wire must be

A. **conducting and of low melting point**

B. conducting and of high melting point

C. insulator and of high melting point

D. insulator and of low melting point

'The sum of emf's and potential differences around a closed loop equals zero' is a consequence of

Kirchoff's 2nd law,

A. Ohm's Law

B. Conservation of charge

C. Conservation of momentum

D. Conservation of energy

‘The sum of emf’s and potential differences around a closed loop equals zero’ is a consequence of

A. Ohm's Law

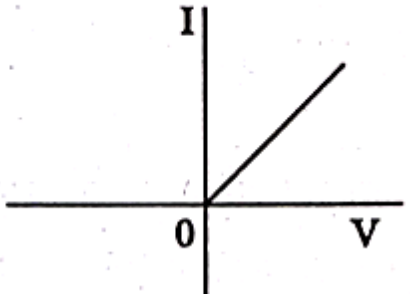
B. Conservation of charge

C. Conservation of momentum

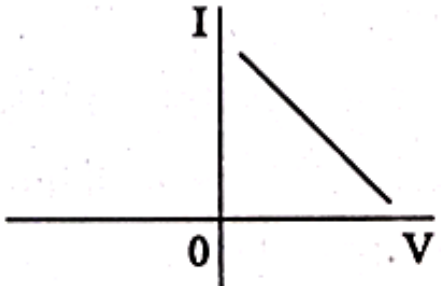
D. Conservation of energy

Which one of the following graphs correctly represents the current (I) - voltage (V) variation for a rectangular piece of a semiconductor wafer ?

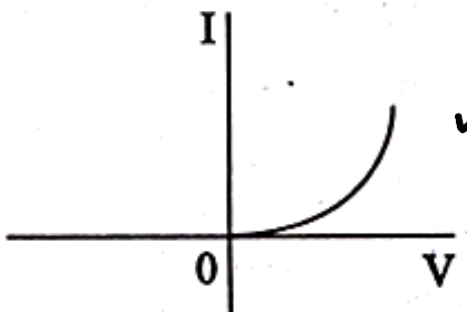
(a)



(b)



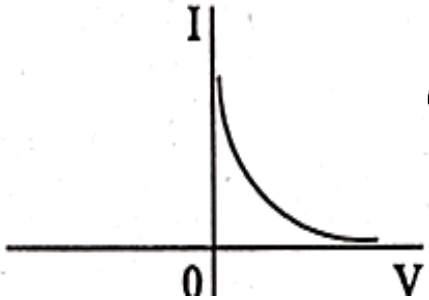
(c)



✓

not following Ohm's law,

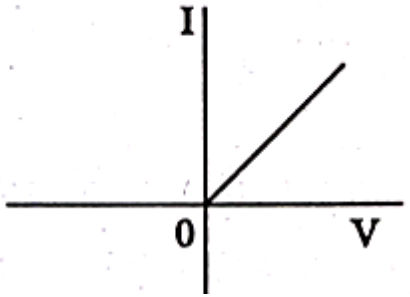
(d)



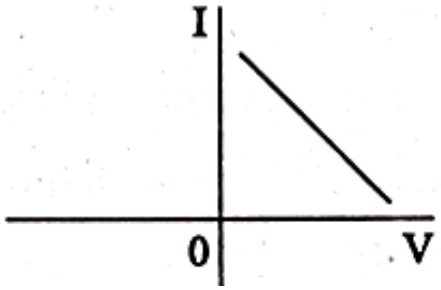
q

Which one of the following graphs correctly represents the current (I) - voltage (V) variation for a rectangular piece of a semiconductor wafer ?

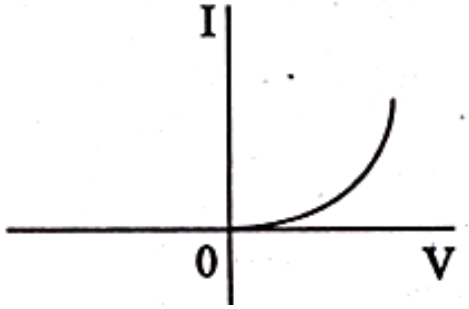
(a)



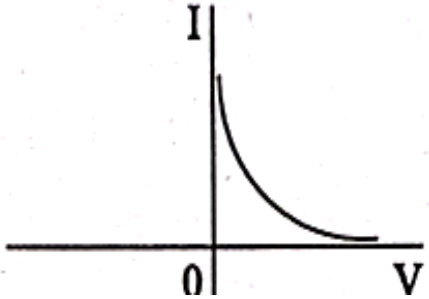
(b)



(c)



(d)



ANS : C

When the short circuit condition occurs, the current in the circuit

A. becomes zero

B. remains constant

C. increases substantially

D. keeps on changing randomly

When the short circuit condition occurs, the current in the circuit

A. becomes zero

B. remains constant

C. increases substantially

D. keeps on changing randomly

A given conductor carrying a current of I ampere. It produces an amount of heat equal to 2000 J. The current through the conductor is doubled the amount of heat produced will be

(a) 2000 J (b) 4000 J

(c) 8000 J (d) 1000 J

$2000\,J = I^2Rt$ } Heat $\propto I^2$

$(2I)^2Rt = 4I^2Rt = 4 \times 2000 = 8000\,J$

A given conductor carrying a current of I ampere. It produces an amount of heat equal to 2000 J. The current through the conductor is doubled the amount of heat produced will be

(a) 2000 J

(b) 4000 J

(c) 8000 J

(d) 1000 J

ANS : C

The main power supply in India is at 220 V, whereas that in the US is at 110 V. Which one among the following statements in this regard is correct?

(a) 110 V is safer but more expensive to maintain.
(b) 110 V is safer and cheaper to maintain.
(c) 110 V leads to lower power loss.
(d) 110 V works better at higher latitudes.

	India	US
Voltage	220 V →	110 V
Frequency	50 Hz →	60 Hz

The main power supply in India is at 220 V, whereas that in the US is at 110 V. Which one among the following statements in this regard is correct?

(a) 110 V is safer but more expensive to maintain.
(b) 110 V is safer and cheaper to maintain.
(c) 110 V leads to lower power loss.
(d) 110 V works better at higher latitudes.

ANS : A

In India, distribution of electricity for domestic purpose is done in the form of

(a) 220 V, 50 Hz
(b) 110 V, 60 Hz
(c) 220 V, 60 Hz
(d) 110 V, 50 Hz

In India, distribution of electricity for domestic purpose is done in the form of

(a) 220 V, 50 Hz
(b) 110 V, 60 Hz
(c) 220 V, 60 Hz
(d) 110 V, 50 Hz

ANS : A

Which one among the following is the correct order of power consumption for light of equal intensity?

(a) CFL Tube < Fluorescent Tube < Incandescent Bulb < Light Emitting Diode

(b) Light Emitting Diode < CFL Tube < Fluorescent Tube < Incandescent Bulb

(c) CFL Tube < Fluorescent Tube < Light Emitting Diode < Incandescent Bulb

(d) Incandescent Bulb < Light Emitting Diode < Fluorescent Tube < CFL Tube

current is same,

$P = I^2R$

$P \downarrow$ if $R \downarrow$

(LED) — least resistance → so least power consumption,

Which one among the following is the correct order of power consumption for light of equal intensity?

(a) CFL Tube < Fluorescent Tube < Incandescent Bulb < Light Emitting Diode

(b) Light Emitting Diode < CFL Tube < Fluorescent Tube < Incandescent Bulb

(c) CFL Tube < Fluorescent Tube < Light Emitting Diode < Incandescent Bulb

(d) Incandescent Bulb < Light Emitting Diode < Fluorescent Tube < CFL Tube

ANS : B

When an electrical safety fuse is rated (marked) as 16 A, it means it

(a) will not work, if current is less than 16 A

(b) has a resistance of 16 Ω

(c) will work if the temperature is more than 16°C

(d) will be blown (break) if current exceeds 16 A

When an electrical safety fuse is rated (marked) as 16 A, it means it

(a) will not work, if current is less than 16 A

(b) has a resistance of 16 Ω

(c) will work if the temperature is more than 16°C

(d) will be blown (break) if current exceeds 16 A

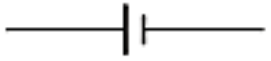
ANS : D

. Which one among the following is the true representation of (i) variable DC potential (ii) rheostat and (iii) AC ammeter respectively?

(a) (i)

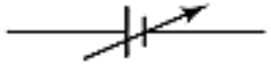
(ii) 

(iii) 

(b) (i) 

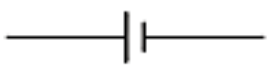
(ii) 

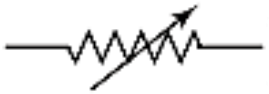
(iii) 

(c) (i) 

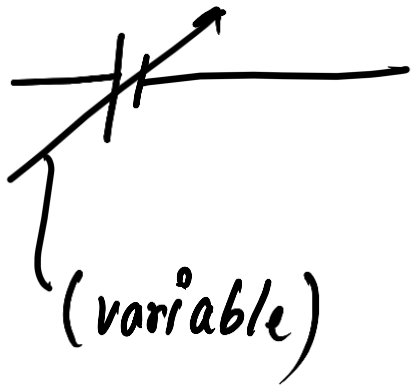
(ii) 

(iii) 

(d) (i) 

(ii) 

(iii) 

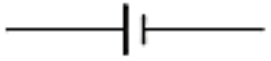


. Which one among the following is the true representation of (i) variable DC potential (ii) rheostat and (iii) AC ammeter respectively?

(a) (i)

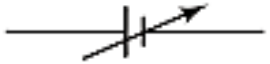
(ii) 

(iii) 

(b) (i) 

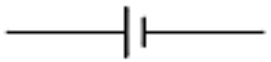
(ii) 

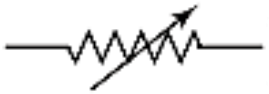
(iii) 

(c) (i) 

(ii) 

(iii) 

(d) (i) 

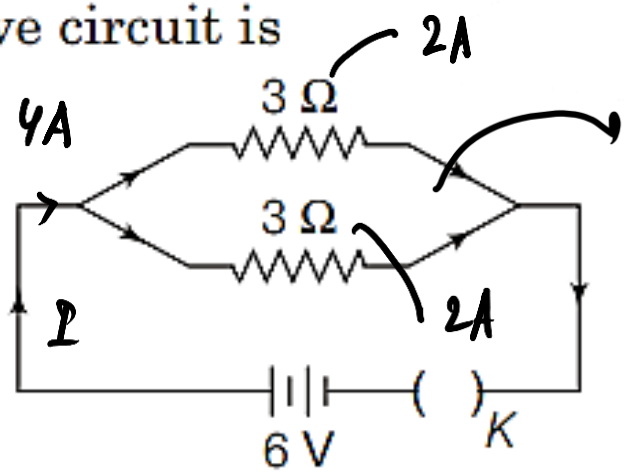
(ii) 

(iii) 

ANS : C

Consider the following circuit,

The current flowing through each of the resistors connected in the above circuit is



(a) 2 A (b) 1 A (c) 9 A (d) 4 A

Requivalent $= \frac{3}{2}\ \Omega$

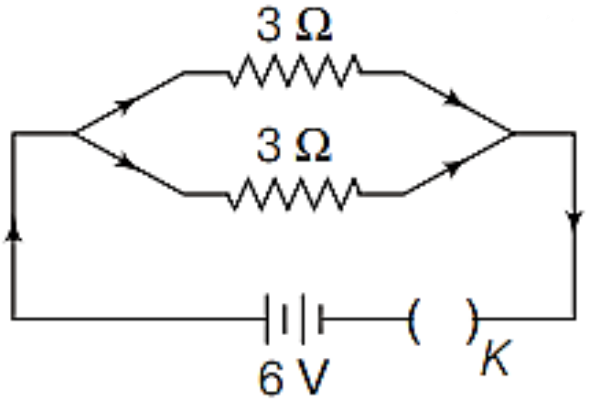
current through circuit,

$$I = \frac{6}{\left(\frac{3}{2}\right)} = \frac{12}{3} = 4\ A$$

3 Ω, 3 Ω } 1 : 1 → reciprocal ratio in which current gets distributed

Consider the following circuit,

The current flowing through each of the resistors connected in the above circuit is



(a) 2 A (b) 1 A (c) 9 A (d) 4 A

ANS : A

Ohm's law defines

(a) a resistance
(b) current only
(c) voltage only
(d) Both current and voltage

$I \propto V$ (defines current and voltage)

$V = IR$

Ohm's law defines

(a) a resistance
(b) current only
(c) voltage only
(d) Both current and voltage

ANS : D

A current I flows through a potential difference V in an electrical circuit containing a resistance R. The product of V and I, i.e. VI may be understood as

(a) resistance R
(b) heat generated by the circuit
(c) thermal power radiated by the circuit
(d) rate of change of resistance

$VI = I^2R$

Heat related power

I^2Rt

Thermal power

A current I flows through a potential difference V in an electrical circuit containing a resistance R. The product of V and I, i.e. VI may be understood as

(a) resistance R
(b) heat generated by the circuit
(c) thermal power radiated by the circuit
(d) rate of change of resistance

ANS : C

Ohm's law can also be taken as a statement for

(a) conservation of energy ✓

(b) conservation of electric charge

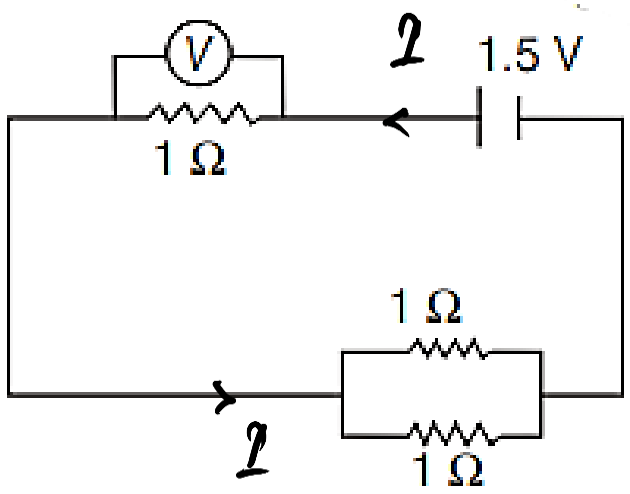
(c) conservation of angular momentum

(d) non-conservation of momentum of the flowing charges

Ohm's law can also be taken as a statement for

(a) conservation of energy
(b) conservation of electric charge
(c) conservation of angular momentum
(d) non-conservation of momentum of the flowing charges

ANS : A



What should be the reading of the voltmeter V in the circuit given above? (All the resistances are equal to 1 Ω and the battery is of 1.5 V)

(a) 1.5 V (b) 0.66 V (c) 1 V (d) 2 V

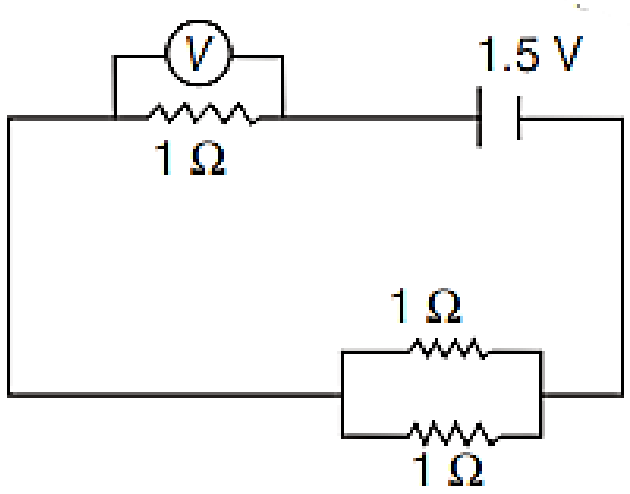
Requivalent $= 1 + \frac{1}{2} = 1.5\ \Omega$

$I = \frac{1.5\ V}{1.5\ \Omega} = 1A$

$V = IR$

$= 1A \times 1\Omega$

$= 1V$



What should be the reading of the voltmeter V in the circuit given above? (All the resistances are equal to 1 Ω and the battery is of 1.5 V)

(a) 1.5 V (b) 0.66 V (c) 1 V (d) 2 V

ANS : C

When you walk on a woolen carpet and bring your finger near the metallic handle of a door, an electric shock is produced. This is because

(a) charge is transferred from your body to the handle
(b) a chemical reaction occurs when you touch the handle
(c) the temperature of the human body is higher than that of the handle
(d) the human body and the handle arrive at thermal equilibrium by the process

same temperature

When you walk on a woolen carpet and bring your finger near the metallic handle of a door, an electric shock is produced. This is because

(a) charge is transferred from your body to the handle
(b) a chemical reaction occurs when you touch the handle
(c) the temperature of the human body is higher than that of the handle
(d) the human body and the handle arrive at thermal equilibrium by the process

ANS : A

The product of conductivity and resistivity of a conductor

(a) depends on pressure applied
(b) depends on current flowing through conductor
(c) is the same for all conductors ✓
(d) varies from conductor-to-conductor

Conductivity (K) = $\frac{1}{\text{resistivity } (\rho)}$

$K\rho = 1$ → same value (1) for all conductors

The product of conductivity and resistivity of a conductor

(a) depends on pressure applied
(b) depends on current flowing through conductor
(c) is the same for all conductors
(d) varies from conductor-to-conductor

ANS : C

Three equal resistances when combined in series are equivalent to 90 Ω. Their equivalent resistance when combined in parallel will be

(a) 10 Ω (b) 30 Ω
(c) 270 Ω (d) 810 Ω

$R + R + R = 90$

$R = 30\ \Omega$

Resistance in parallel $= \frac{30}{3} = 10\ \Omega$

Three equal resistances when combined in series are equivalent to 90 Ω. Their equivalent resistance when combined in parallel will be

(a) 10 Ω
(b) 30 Ω
(c) 270 Ω
(d) 810 Ω

ANS : A

NDA-CDS 1 2025

GS

LIVE

PHYSICS

MAGNETIC EFFECTS OF ELECTRIC CURRENT

CLASS 1

NAVJYOTI SIR

SSBCrack EXAMS