SUB:- Hindi(Entire)

Resistivity (ρ) ρ = rho.

Length
Area
Temperature.

$R \propto l$.

$R \propto \frac{1}{A}$

$R \propto \frac{l}{A}$

$R = k \times \frac{l}{A}$

$k = \rho$

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

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

$R \times A = \rho \times l$

$\rho = \frac{RA}{l}$

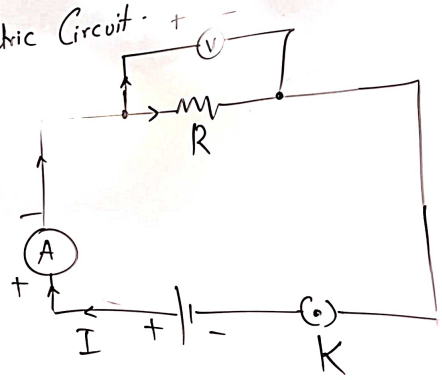
SI unit of resistance = Ohm (Ω)

SI unit of resistivity = Ohm - metre (Ω-m)

24
4:

SUB:-Hindi(Entire)

Electric Circuit.

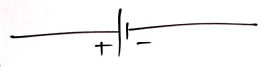
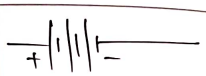
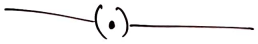
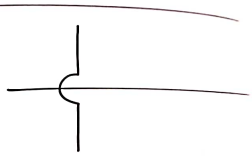
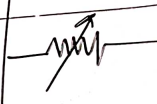
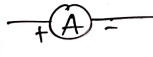


① Ammeter
- Used to measure current
- Connected in series.

② Voltmeter
- Used to measure potential difference.
- Connected in parallel.

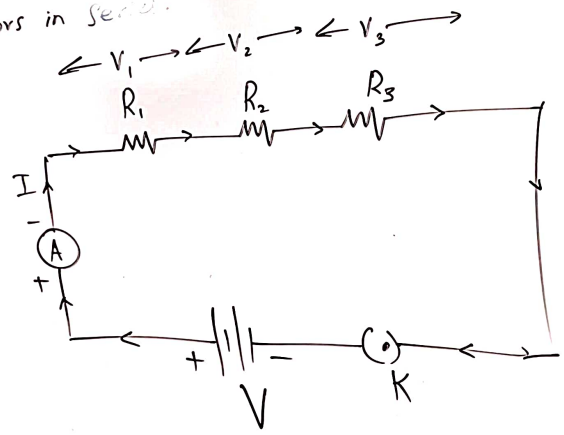
SUB:- Hindi(Entire)

Components of electric circuit.

Component	Symbol
① Electric cell.	
② Battery.	
③ Open tap key	
④ Closed tap key.	
⑤ Connecting wires	
⑥ Crossing wires.	
⑦ Light bulb	
⑧ Resistance.	
⑨ Variable resistance.	
⑩ Ammeter	
⑪ Voltmeter	

SUB:- Hindi (Entire)

Resistors in Series



$V = V_1 + V_2 + V_3$ — (1)

By Ohm's Law,

$V = I \times R$.

$V = I \times R_s$

$V_1 = I \times R_1$

$V_2 = I \times R_2$

$V_3 = I \times R_3$ } — (2)

Put above values in eq. (1)

$IR_s = IR_1 + IR_2 + IR_3$

$\cancel{I}R_s = \cancel{I}(R_1 + R_2 + R_3)$

$R_s = R_1 + R_2 + R_3$

For n resistors.

$R_s = R_1 + R_2 + \dots + R_n$

R_s = effective series resistance

$R_1 = 10\,\Omega$, $R_2 = 10\,\Omega$

$R_3 = 10\,\Omega$

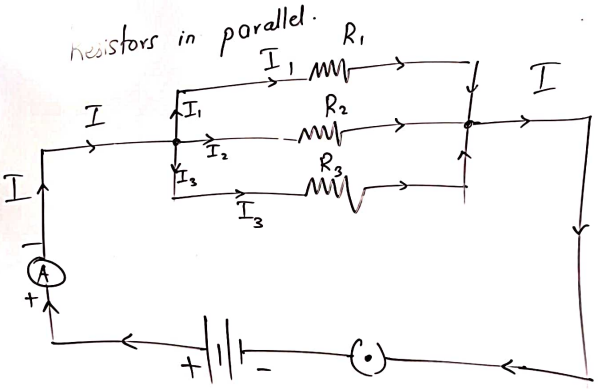
$R_s = R_1 + R_2 + R_3$

$= 10 + 10 + 10$

$R_s = 30\,\Omega$

SUB:- Hindi(Entire)

Resistors in parallel.



$$I = I_1 + I_2 + I_3 \quad - (1)$$

By Ohm's Law.

$V = I \times R$

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

$$I = \frac{V}{R_p} \quad - (2)$$

$$I_1 = \frac{V}{R_1}$$

$$I_2 = \frac{V}{R_2}$$

$$I_3 = \frac{V}{R_3}$$

Put above values in eqn. (1)

$$\frac{V}{R_p} = \frac{V}{R_1} + \frac{V}{R_2} + \frac{V}{R_3}$$

$$\frac{V}{R_p} = V\left[\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}\right]$$

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}.$$

R_p = effective parallel resistance.

For n resistors

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \cdots + \frac{1}{R_n}.$$

If $R_1 = R_2 = R_3 = 10\ \Omega$

$$\frac{1}{R_p} = \frac{1}{10} + \frac{1}{10} + \frac{1}{10}$$

$$\frac{1}{R_p} = \frac{3}{10}$$

$$R_p = \frac{10}{3}$$

$$R_p = 3.33..\ \Omega$$

9/8/2024
friday

Learn Something new today.

Q

a) Given: $l_1 = 1\,m = 100\,cm$

$R_1 = 6\,\Omega$

$l_2 = 70\,cm$

To find: $R_2 = ?$

Solution: $R \propto l$

$R = k \times l$

$R_1 = k \times l_1$ - ①

$R_2 = k \times l_2$ - ②

Divide eq ② by ①

$$\frac{R_2}{R_1} = \frac{k \times l_2}{k \times l_1}$$

$$\frac{R_2}{R_1} = \frac{l_2}{l_1}$$

$$\frac{R_2}{6} = \frac{70}{100}$$

$$R_2 = \frac{70 \times 6}{100}$$

$$R_2 = \frac{420}{100} = 4.2\,\Omega$$

4/8/2021
Friday

Learn something new today

Given $= 80\ \Omega$

$R_p = 20\ \Omega$

To find: $R_1 = ?$

$R_2 = ?$

Solution: $R_s = 80$

$R_1 + R_2 = 80 \quad -①$

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$$

$$\frac{1}{20} = \frac{R_2 + R_1}{R_1 \times R_2}$$

$$\frac{1}{20} = \frac{80}{R_1 \times R_2} \quad (\text{From } ①)$$

$R_1 \times R_2 = 1600$

$$R_2 = \frac{1600}{R_1} \quad -②$$

$R_1 + R_2 = 80$ (From ①)

$$R_1 + \frac{1600}{R_1} = 80 \quad (\text{From } ②)$$

Multiply throughout by R_1

$$R_1 \times R_1 + R_1 \times \frac{1600}{R_1} = 80 \times R_1$$

$$R_1^2 + 1600 = 80R_1$$

$$R_1^2 - 80R_1 + 1600 = 0$$

$R_1 \times R_1 - 40R_1 - 40R_1 + 40 \times 40 = 0$

$R_1(R_1 - 40) - 40(R_1 - 40) = 0$

$(R_1 - 40)(R_1 - 40) = 0$

$R_1 - 40 = 0$ or $R_1 - 40 = 0$

$R_1 = 40$ or $R_1 = 40$

$\therefore R_1 = 40\ \Omega$

$R_1 + R_2 = 80$

$40 + R_2 = 80$

$R_2 = 80 - 40$

$R_2 = 40\ \Omega$

4/8/2021
friday

Learn something new today

a)

Q. $Q = 420C$

$t = 5\ min = (5 \times 60)s$

To find : $I = ?$

Solution : $I = \frac{Q}{t}$

$= \frac{420}{5 \times 60} = \frac{7}{5}$

$$\begin{array}{r} 1.4 \\ 5\overline{)7} \\ -5 \\ \hline 20 \\ -20 \\ \hline 0 \end{array}$$

$\boxed{I = 1.4A}$

20/8/24
Tuesday

Refractive Index (n)

① $n = \frac{\sin i}{\sin r}$

② Refractive index of first medium w.r.t second medium

$\rightarrow {}_1n_2 = \frac{V_2}{V_1}$

$\rightarrow {}_1n_2 = \frac{n_1}{n_2}$

Refractive index of second medium w.r.t first medium

$\rightarrow {}_2n_1 = \frac{V_1}{V_2}$

$\rightarrow {}_2n_1 = \frac{n_2}{n_1}$