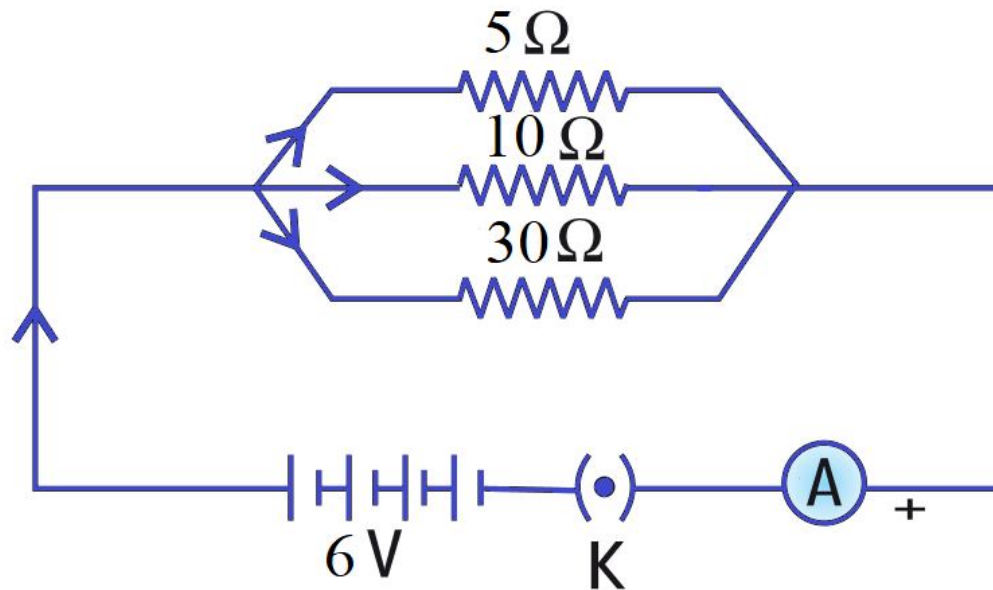


## CASE STUDY QUESTION 36

Read the following and answer any four questions from (i) to (v)

Aditya decided to complete his Physics Project. He purchased three resistors  $5\ \Omega$ ,  $10\ \Omega$  and  $30\ \Omega$  from the shop. Later he purchased a  $6\ \text{V}$  battery, switch (which works as key) and an ammeter to complete his circuit as shown below:



(i) Find the current through  $5\ \Omega$ .

- (a) 1.2 A      (b) 1.5 A      (c) 1 A      (d) 2 A

**Current through  $5\ \Omega$**

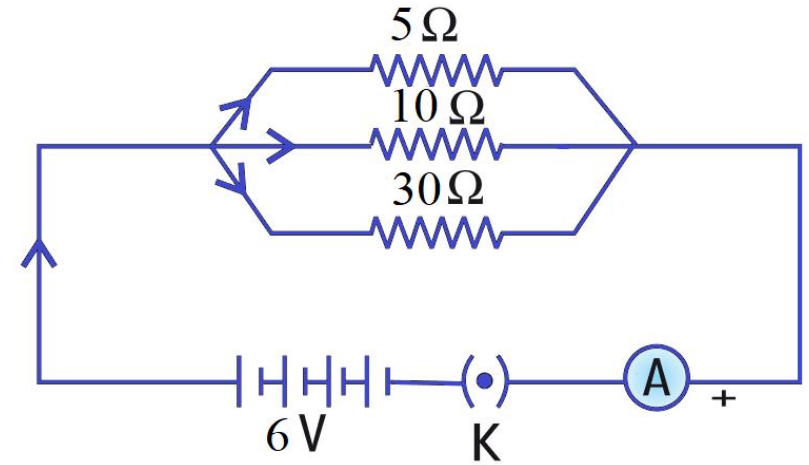
$$I_1 = \frac{V}{R_1} = \frac{6}{5} = 1.2\ \text{A}.$$

(ii) Find the current through  $10\ \Omega$ .

- (a) 0.6 A      (b) 0.2 A      (c) 1 A      (d) 0.5 A

**Current through  $10\ \Omega$**

$$I_2 = \frac{V}{R_2} = \frac{6}{10} = 0.6\ \text{A}.$$



(iii) Find the current through  $30\ \Omega$ .

- (a)  $0.6\ \text{A}$       (b)  $0.2\ \text{A}$       (c)  $1\ \text{A}$       (d)  $0.5\ \text{A}$

**Current through  $30\ \Omega$**

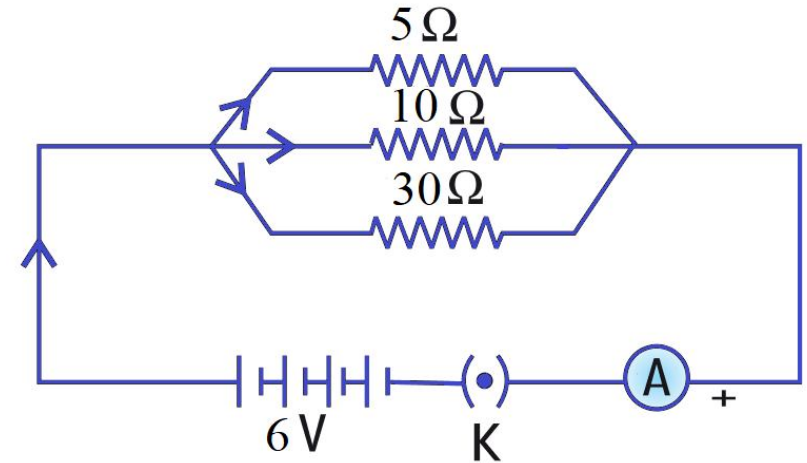
$$I_3 = \frac{V}{R_3} = \frac{6}{30} = 0.2\ \text{A}.$$

(iv) Find the total current in the circuit.

- (a)  $1.2\ \text{A}$       (b)  $1.5\ \text{A}$       (c)  $1\ \text{A}$       (d)  $2\ \text{A}$

The total current through the circuit is

$$\begin{aligned} I &= I_1 + I_2 + I_3 \\ &= 1.2 + 0.6 + 0.2 = 2\ \text{A} \end{aligned}$$



(v) Find the total resistance of the circuit.

(a)  $2 \Omega$

(b)  $4 \Omega$

(c)  $3 \Omega$

(d)  $5 \Omega$

$$\begin{aligned}\frac{1}{R_p} &= \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \\ &= \frac{1}{5} + \frac{1}{10} + \frac{1}{30} \\ &= \frac{6 + 3 + 1}{30} = \frac{10}{30} = \frac{1}{3}\end{aligned}$$

$$\therefore R_p = 3 \Omega$$

