Notes   Class – 5
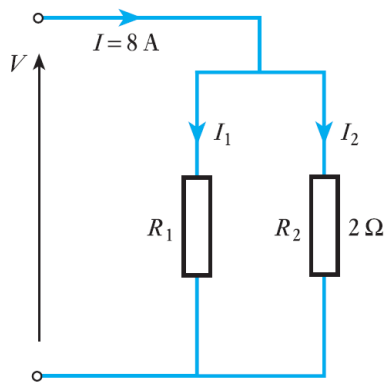
1. A current of 8 A is shared between two resistors in the network shown in Fig. Calculate the current in the 2 Ω resistor, given that
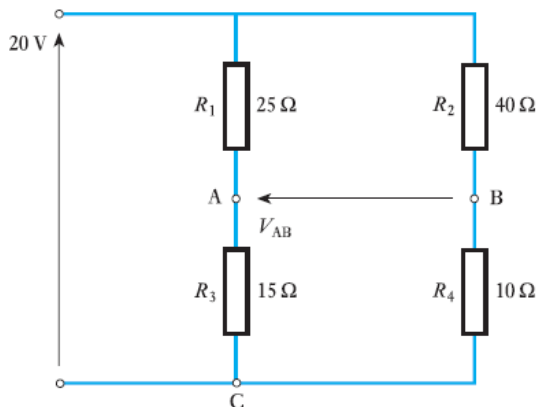
(a) $R1 = 2\ \Omega$;

(b) $R1 = 4\ \Omega$.

Solution

(a) $I_2 = I\dfrac{R_1}{R_1 + R_2} = 8 \times \dfrac{2}{2+2} = \textbf{4.0 A}$

(b) $I_2 = I\dfrac{R_1}{R_1 + R_2} = 8 \times \dfrac{4}{4+2} = \textbf{5.3 A}$

2. Calculate V_{AB} for the network shown in Fig

Solution

For branch A, let V_{AC} be the voltage at A with respect to C:

$$V_{AC} = \frac{R_3}{R_1 + R_3} \cdot V = \frac{15}{25 + 15} \times 20 = 7.5 \text{ V}$$

For branch B:

$$V_{BC} = \frac{R_4}{R_2 + R_4} \cdot V = \frac{10}{40 + 10} \times 20 = 4.0 \text{ V}$$

Applying Kirchhoff's second law to loop ABC:

$$0 = V_{AB} + V_{BC} + V_{CA} = V_{AB} + V_{BC} - V_{AC}$$

$$V_{AB} = V_{AC} - V_{BC} = 7.5 - 4.0 = 3.5 \text{ V}$$