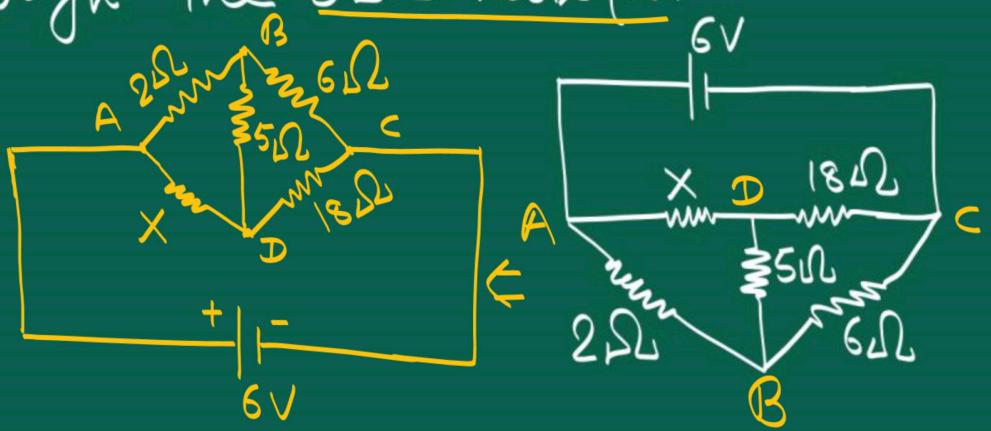


(Q) Find out the magnitude of resistance X in the circuit shown in fig. when no current flows through the 5Ω resistor.

10%
=

Wheatstone
bridge is
balanced.



$$\frac{R_1}{R_2} = \frac{R_3}{R_4}$$

$$\frac{2}{6} = \frac{x}{18}$$

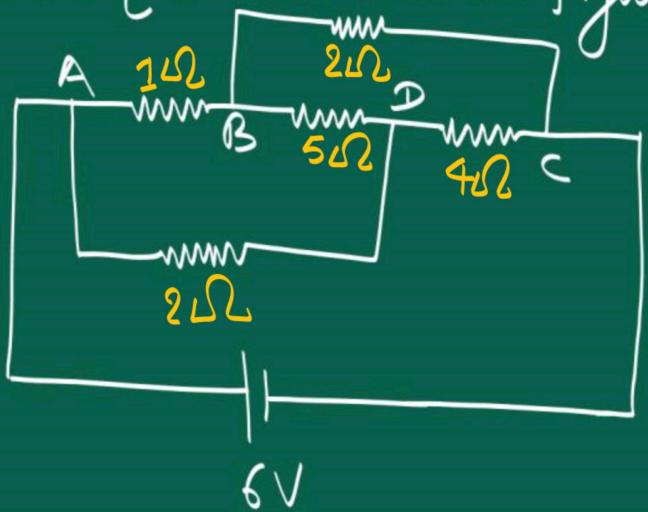
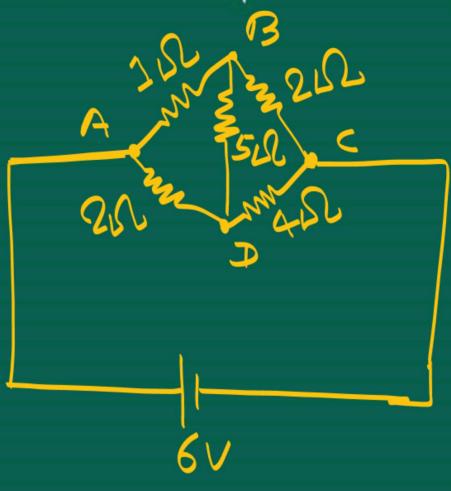
$$2 \times 18 = 6x$$

$$x = \frac{2 \times 18}{6}$$

$$x = 6 \Omega \text{ Ans}$$

(Q.) Calculate the current drawn from the battery by the network of resistors shown in figure.

$$80\text{ m}$$

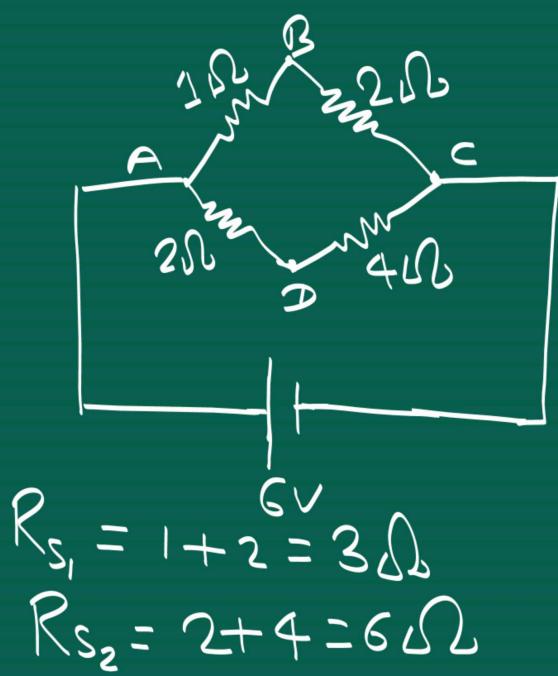


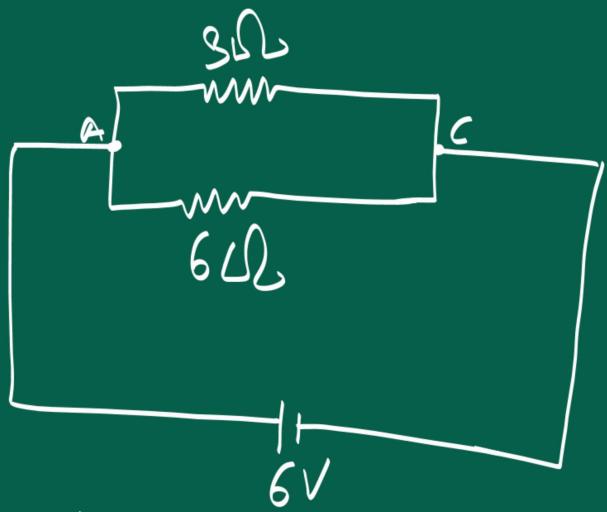
$$\frac{R_1}{R_2} = \frac{R_3}{R_4}$$

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

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

This bridge is balanced





$$\frac{1}{R_{eq}} = \frac{1}{3} + \frac{1}{6} = \frac{6+3}{3 \times 6}$$

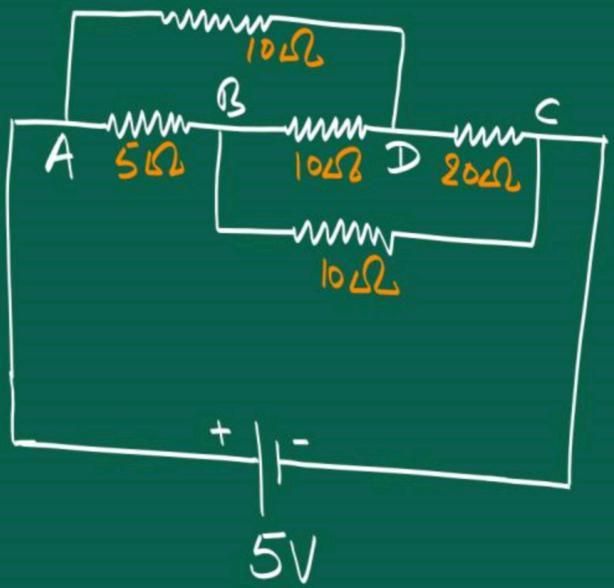
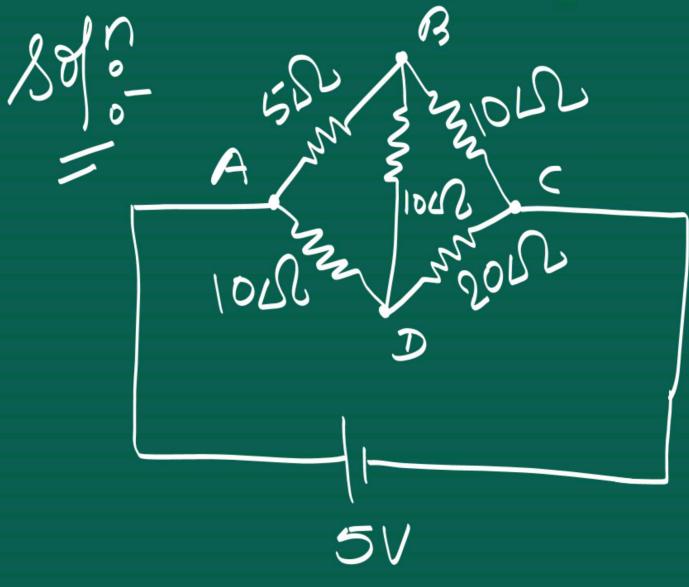
$$\frac{1}{R_{eq}} = \frac{1}{18}$$

$$R_{eq} = 18\Omega$$

$$V = IR$$

$$I = \frac{V}{R} = \frac{6}{18} = 3A$$

$\langle Q \rangle$ The current I drawn from the 5V source will be

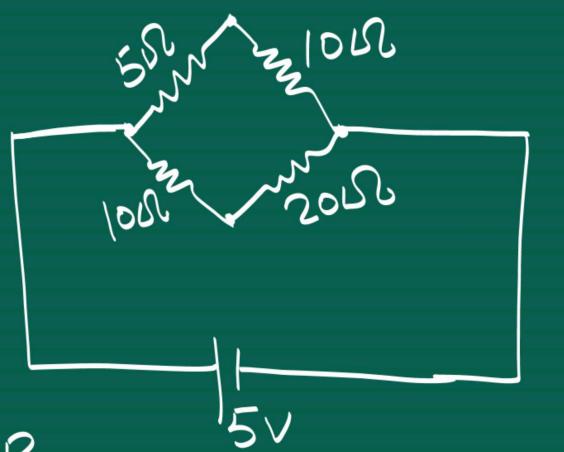


$$\frac{R_1}{R_2} = \frac{R_3}{R_4}$$

$$\frac{\phi}{\phi_2} = \frac{10}{20}$$

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

This bridge is balanced.



$$R_{S1} = 5 + 10 = 15 \Omega$$

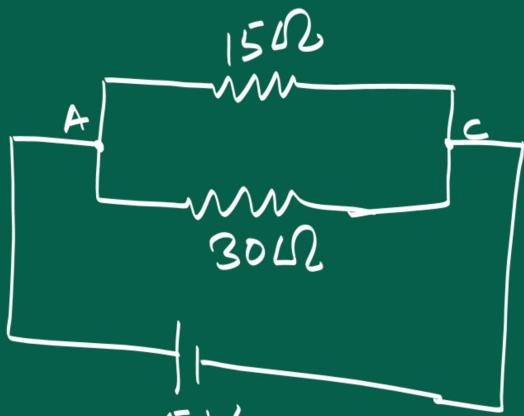
$$R_{S2} = 10 + 20 = 30 \Omega$$

$$\frac{1}{R_{eq}} = \frac{1}{15} + \frac{1}{30}$$

$$\frac{1}{R_{eq}} = \frac{30+15}{15 \times 30}$$

$$\frac{1}{R_{eq}} = \frac{45}{15 \times \cancel{30}} \quad \cancel{10}$$

$$\left. \begin{array}{l} \frac{1}{R_{eq}} = \frac{1}{10} \\ R_{eq} = 10\Omega \end{array} \right|$$



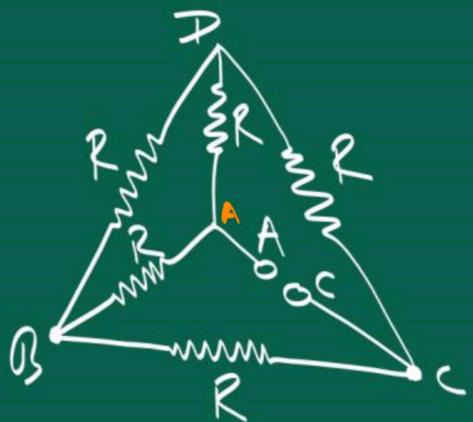
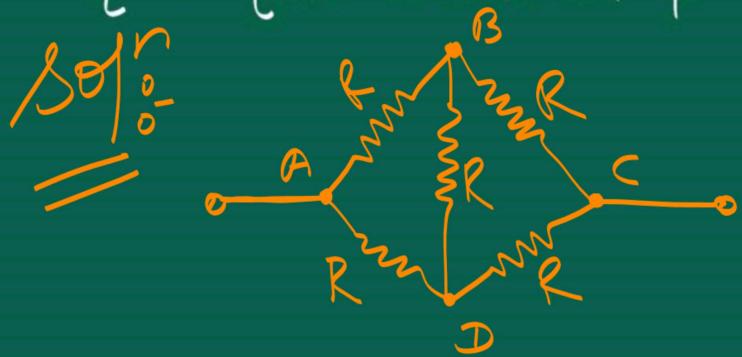
$$V = IR$$

$$I = \frac{V}{R} = \frac{5}{10}$$

$$I = 0.5 A$$

~~Ans~~

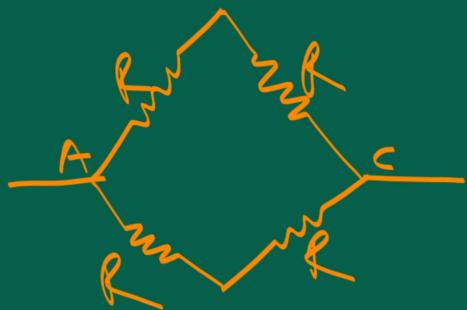
(Q) Each of resistances in the network shown in fig. equals R . Find the resistance between two terminals A & C.



$$\frac{R_1}{R_2} = \frac{R_3}{R_4}$$

$$\frac{R}{R} = \frac{R}{R}$$

This bridge is balanced

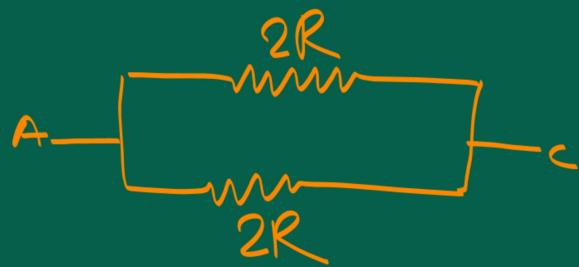


$$R_{S_1} = R + R = 2R$$

$$R_{S_2} = R + R = 2R$$

$$\frac{1}{R_{eq}} = \frac{1}{2R} + \frac{1}{2R}$$

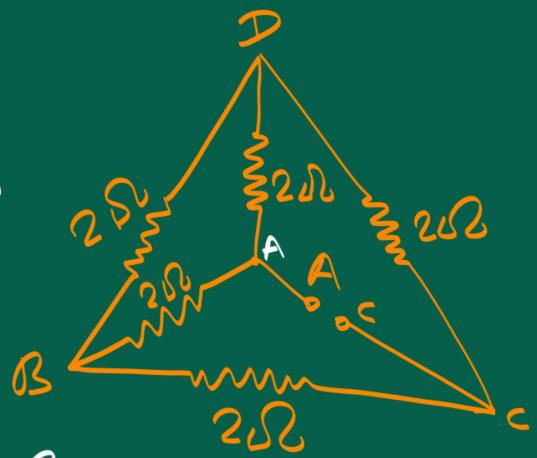
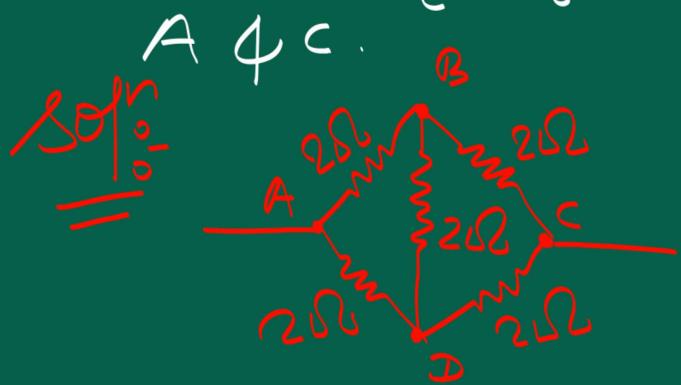
$$\frac{1}{R_{eq}} = \frac{2R + 2R}{2R \times 2R}$$



$$\frac{1}{R_{eq}} = \frac{2R}{2R \times 2R}$$

$$R_{eq} = R \Omega \quad \text{Ans} \quad \underline{\underline{=}}$$

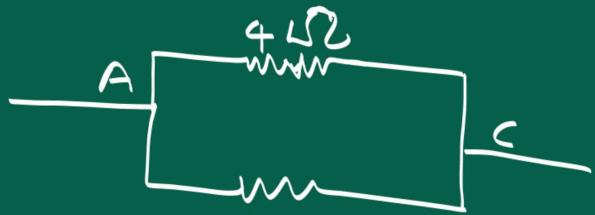
(Q) Find the Resistance
between two terminals



$$\left| \begin{array}{l} \frac{R_1}{R_2} = \frac{R_3}{R_4} \\ \frac{2}{2} = \frac{2}{2} \end{array} \right| \text{This bridge is balanced}$$

$$R_{S_1} = 2 + 2 = 4 \Omega$$

$$R_{S_2} = 2 + 2 = 4 \Omega$$



$$\frac{1}{R_{eq}} = \frac{1}{4} + \frac{1}{4} = \frac{1}{2}$$

$$R_{eq} = 2 \Omega$$