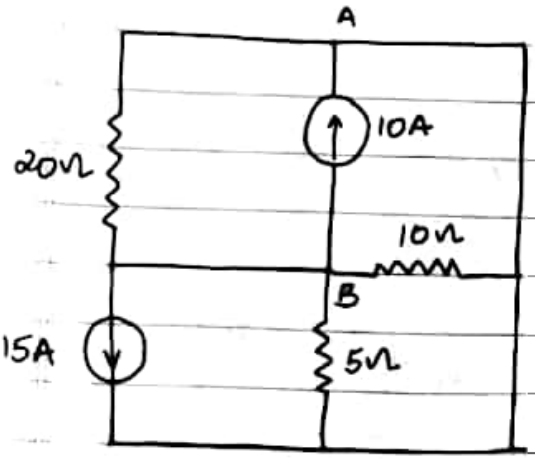
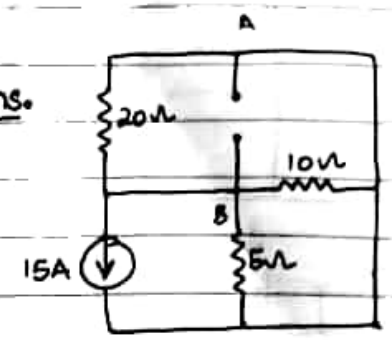
Assignment -1
Electrical Science - I (15B11EC111)

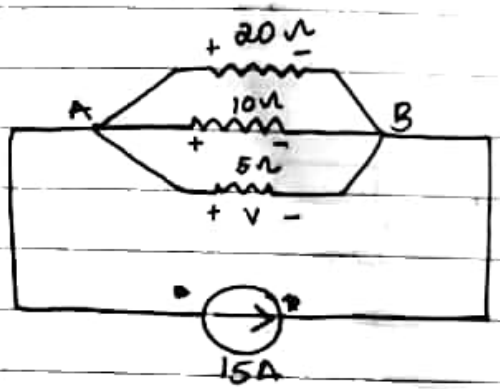
Q-1 [CO1] Determine the voltage drop across 10 ohm resistance in the circuit.



Ans.



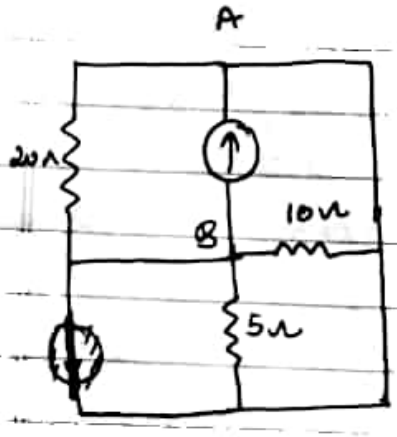
|||



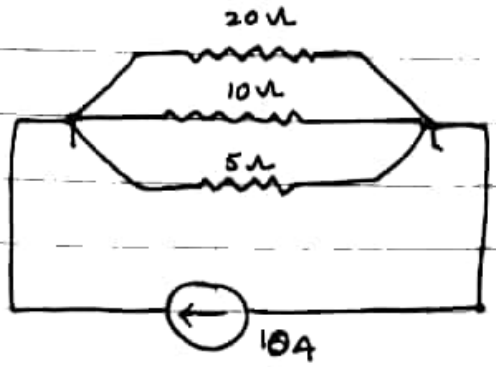
$$\frac{1}{Req} = \frac{1}{10} + \frac{1}{20} + \frac{1}{5} = \frac{2+1+4}{20} = \frac{7}{20} \quad Req = \frac{20}{7}\ \Omega$$

$$V = iR$$

$$= \frac{15 \times 20}{7} = \frac{300}{7}\ V.$$



≡

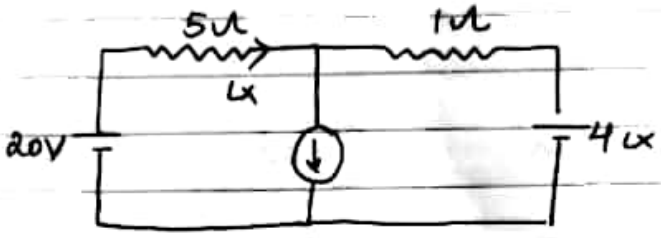


$$\frac{1}{Req} = \frac{20}{7} \quad Req = \frac{20}{7}\ \Omega$$

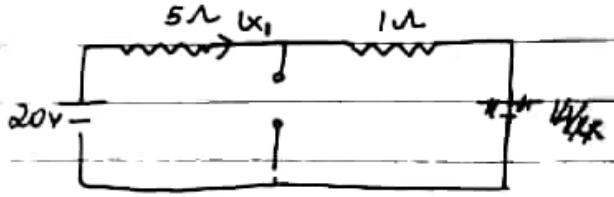
$$V = iR = -10 \times \frac{20}{7} = -\frac{200}{7}\ V$$

$$V = +\frac{100}{7} = \boxed{14.28\ V}$$

4 [CO2] Find the current I_x by superposition principle.

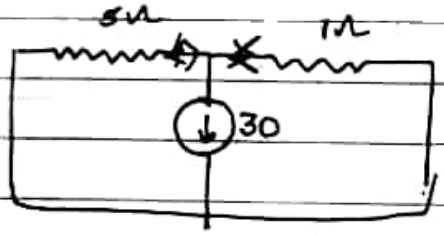


I



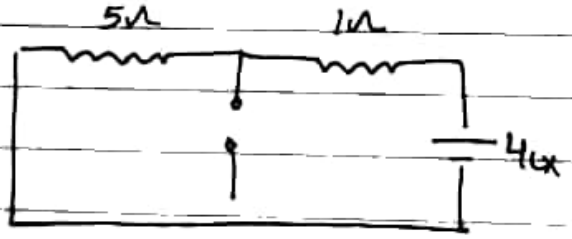
$$I_{x_1} = \frac{20}{6} A$$

II



$$I_{x_2} = + \frac{30 \times 1}{6} = +5A$$

III



$$I_{x_3} = -\frac{4I_x}{6}$$

$$I_x = \frac{20}{6} + 5 - \frac{4I_x}{6}$$

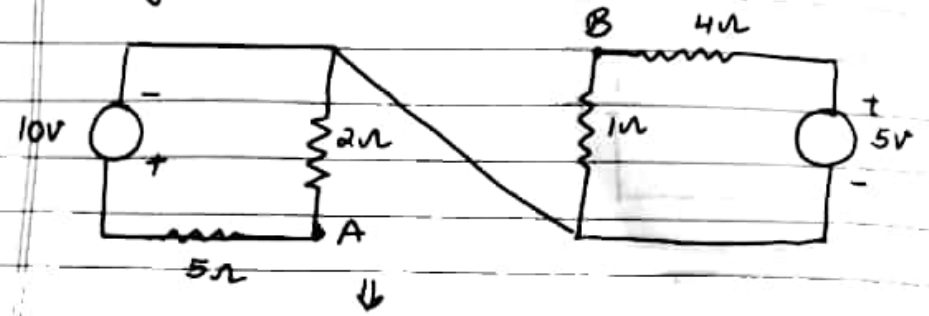
$$\frac{10I_x}{6} = \frac{50}{6}$$

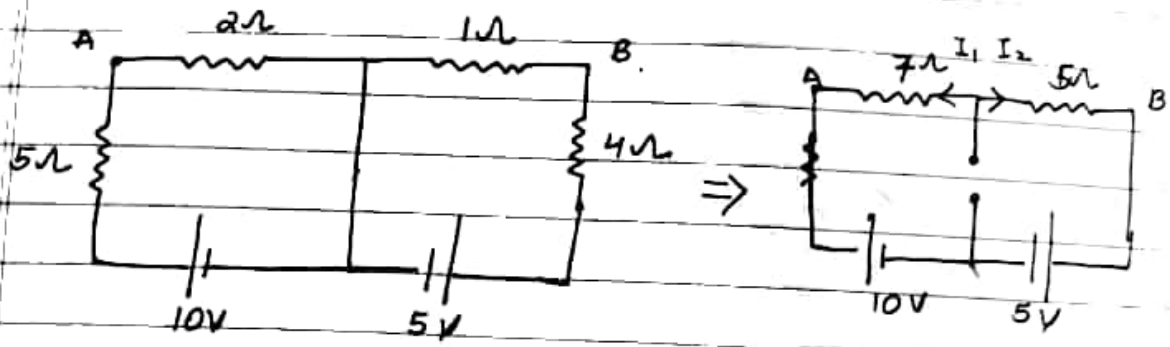
$$I_x = 5A$$

Date ___/___/_____

Saathi

3 [CO2] Determine the Thevenin's equivalent circuit across terminal AB for the circuit.



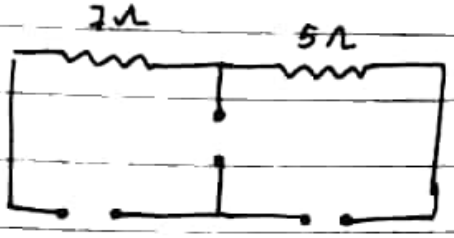


$$\frac{V_{th}-10}{7}+\frac{V_{th}-5}{5}=0$$

$$5V_{th}-50+7V_{th}-35=0$$

$$12V_{th}-85=0$$

$$V_{th}=\frac{85}{12}\ V$$



$$\frac{1}{R_{th}}=\frac{1}{7}+\frac{1}{5}=\frac{7+5}{35}=\frac{12}{35}$$

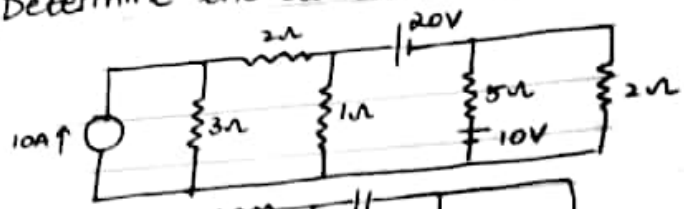
$$R_{th}=\frac{35}{12}\ \Omega$$

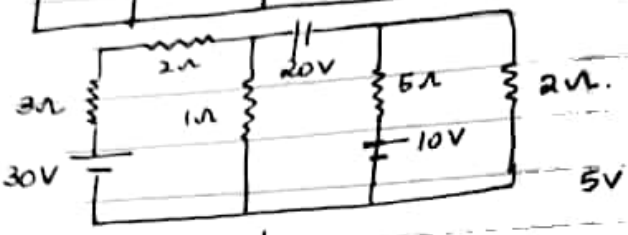
$$I=\frac{V_{th}}{R_{th}}=\frac{85\times 12}{12\times 35}=2.4\ A$$

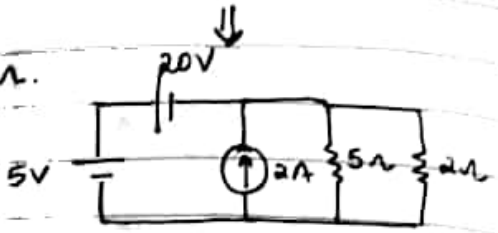
Q-2 [CO1] Determine the current in 5ohm resistor for the circuit

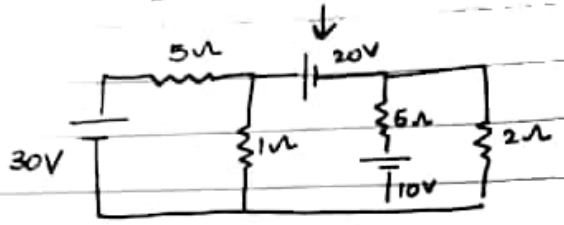
3 [CO2

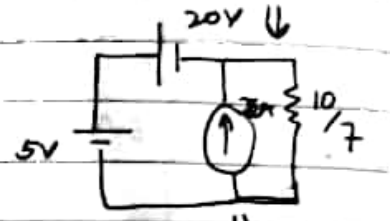
Ans-2

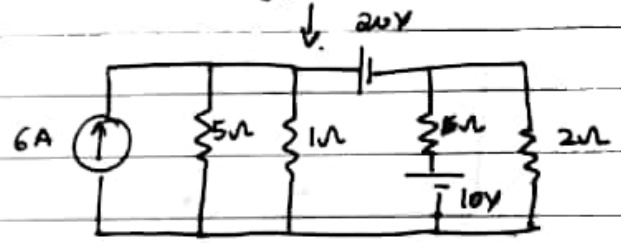


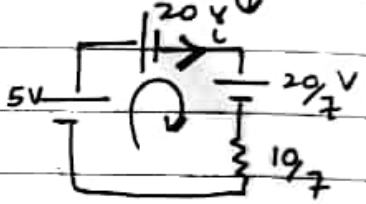


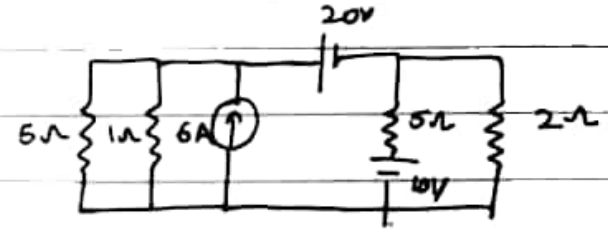












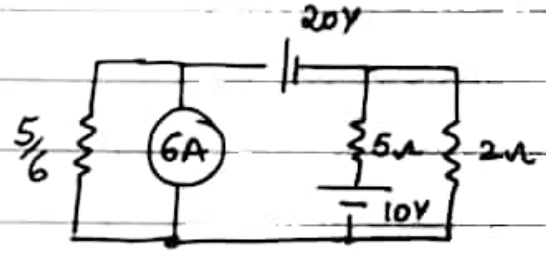
$$-5+20+\frac{20}{7}-\frac{10}{7}i=0$$

$$15+\frac{20}{7}-\frac{10}{7}i=0$$

$$105+20-10i=0$$

$$125-10i=0$$

$$i=12.5$$



$$I_{5ohm}=\frac{12.5\times 2}{7}$$

$$I_{5ohm}=3.5\,A$$