Answer

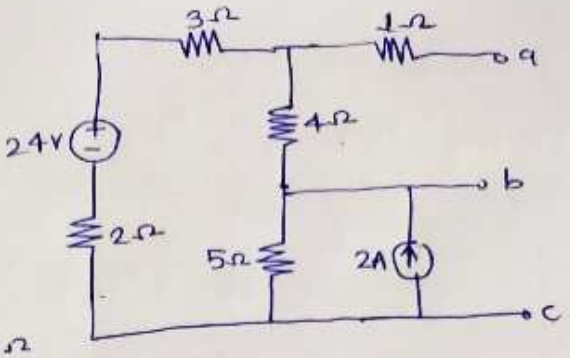
Thevenin Equivalent circuit:

Across ab:

- Remove all active sources to Find $R_{th} = R_{ab}$.

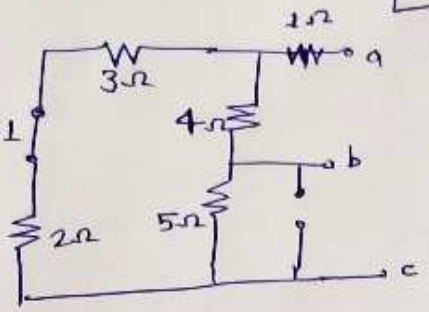
→ Voltage source – Short circuit

→ Current source (independent) – open circuit



$R_{ab} = R_{th}$

$R_{ab} = [(3+2+5) \,||\, 4] + 1$

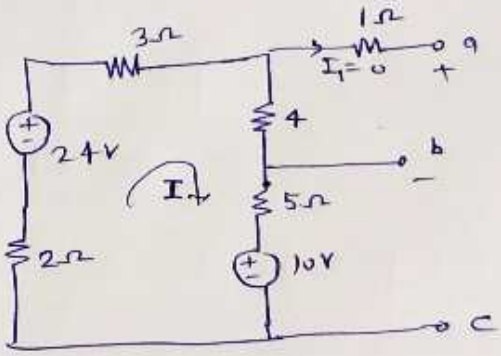


$R_{ab} = (10 \,||\, 4) + 1$

$= \frac{40}{14} + 1$

$= \frac{54}{14} = \frac{27}{7}$

$$\boxed{R_{ab} = \frac{27}{7} = 3.857\,\Omega}$$



$V_{ab} = ?$

- Convert current source into voltage source as shown

$V_s = I_s \cdot R_p = 2 \times 5 = 10V$.

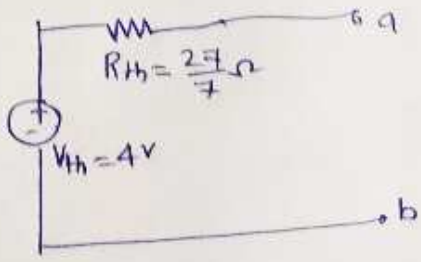
$R_s = 5\Omega$ (series)

$$I = \frac{24-10}{3+4+5+2} = \frac{14}{14} = 1A$$

$V_{ab} = I_1 \times 1 + 4 \times I = 0 \times 1 + 4 \times 1 = 4V$

$$\boxed{V_{ab} = V_{th} = 4\,V}$$

Hence equivalent circuit can be drawn as:



Hope it helps you out.

In case any doubt please feel free to ask.

I will be happy to help you.

Thanks!!

Note: part (b) is similar and can be solved following same steps as in part (a).

Likes: 0 **Dislikes: 0**
