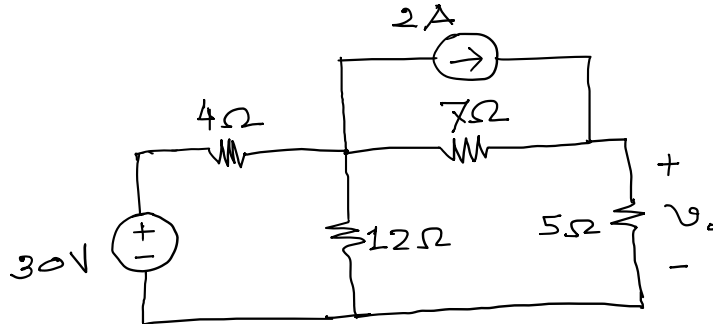


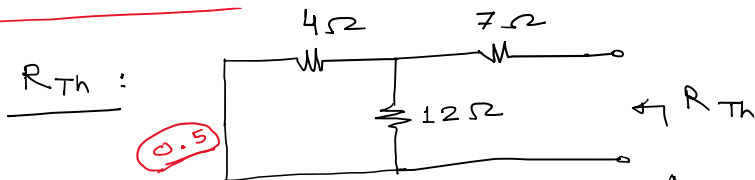
Marks = 5

Time = 20 minutes

1. Calculate the voltage v_o in the following circuit using the Thevenin theorem.

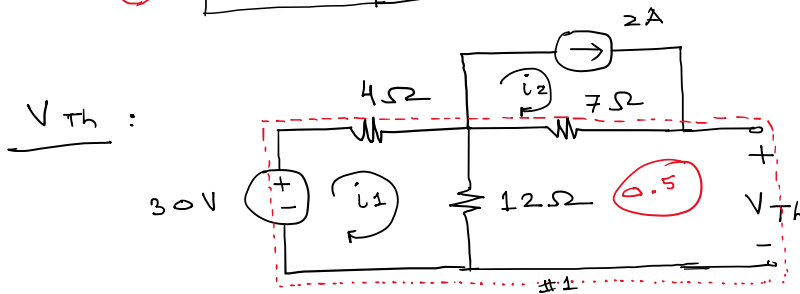


SOLUTION:



$$R_{Th} = 7 + \frac{4 \times 12}{4 + 12} = 10 \Omega$$

1



$$i_1 = \frac{30}{4 + 12} = 1.875 A$$

$$i_2 = 2 A$$

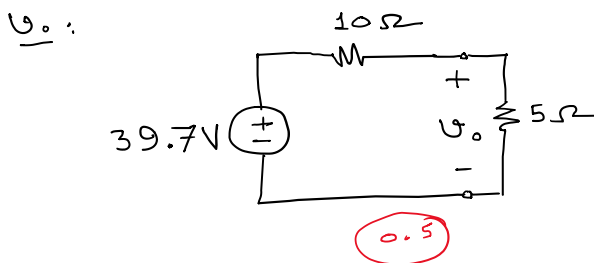
KVL at loop #1,

$$-30 + 4i_1 - 7i_2 + V_{Th} = 0$$

$$\Rightarrow V_{Th} = 30 - 4 \times 1.875 + 7 \times 2$$

2

$$= 36.5 V$$



$$v_o = \frac{36.5}{10 + 5} \times 5 = 12.17 V$$

0.5