Lab -6

Pre-Lab Report

Circuit diagram whose Thevenin's equivalent to be determined

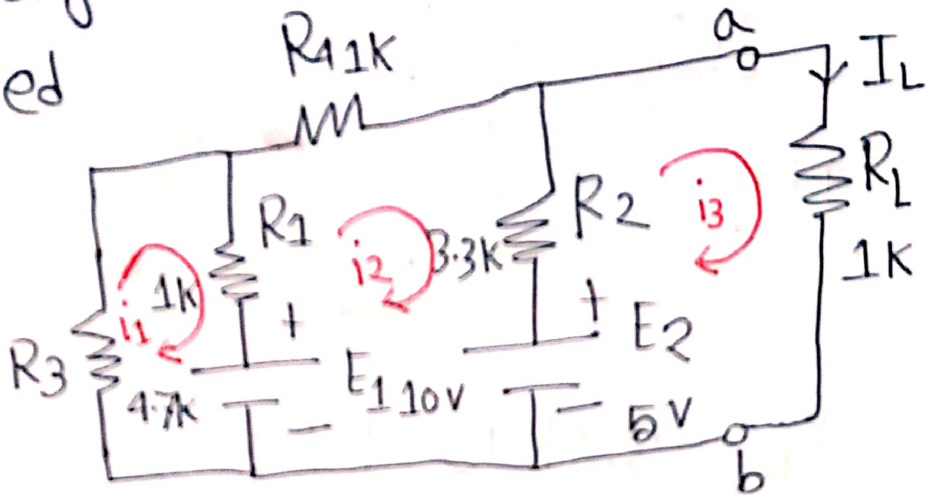


Figure 1

Applying KVL at mesh 1, 2 and 3.

$$(5.7k)\, i_1 - (1k)\, i_2 = -10$$

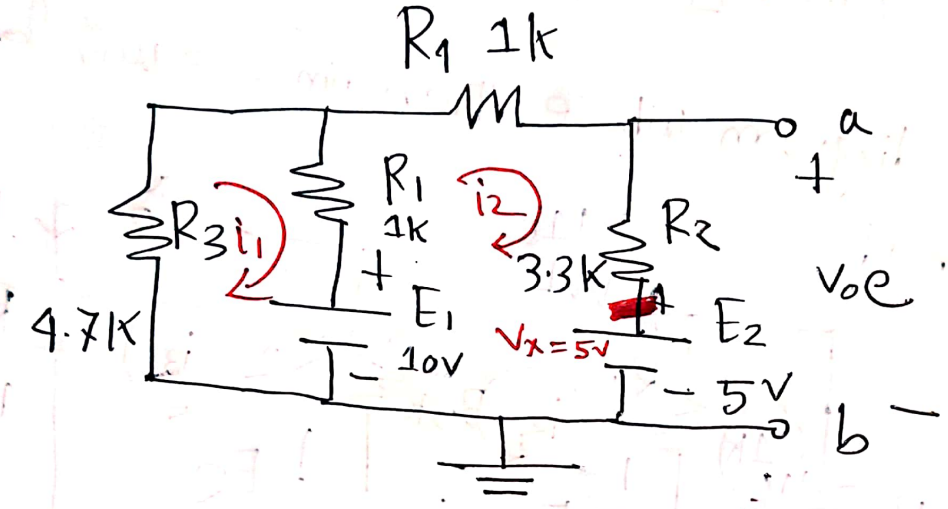
$$-(1k)\, i_1 + (5.3k)\, i_2 - (3.3k)\, i_3 = 10 - 5$$

$$(-3.3k)\, i_2 + (4.3k)\, i_3 = 5$$

so, $i_3 = 3.26mA$ [using calcES calculator]

$i_3 = I_L = 3.26mA$

Figure 2: Circuit diagram to measure the open circuit voltage.



$$E_{Th} = 3.3k\, i_2 + 5V$$

Applying KVL at mesh 1 and 2.

$$(5.7k)\, i_1 - (1k)\, i_2 = -10$$

$$-(1k)\, i_1 + (5.3k)\, i_2 = 10 - 5$$

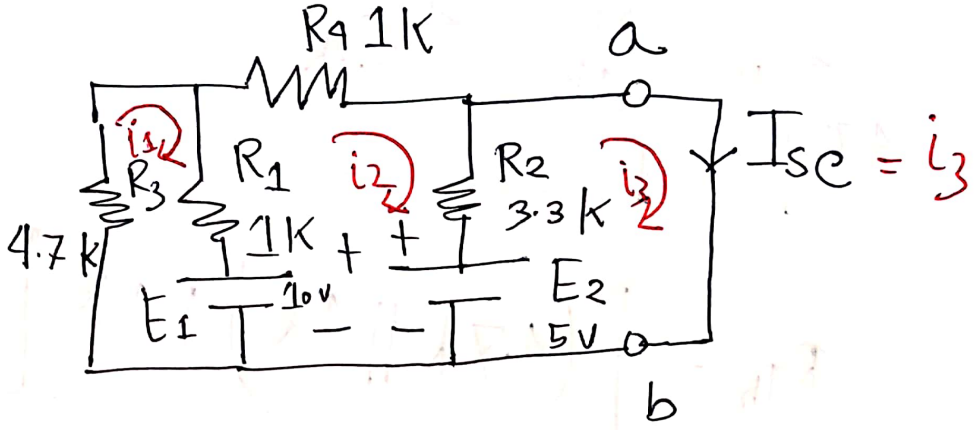
$$i_2 = 0.633mA$$

$$E_{Th} = 3.3k * (0.633m) + 5$$

(10^3 and 10^{-3})

$$= 7.089V$$

Figure-3 Circuit diagram to measure the Shord .circuit current



Applying Mesh analysis

$$(5.7K)i_1 - (1K)i_2 = -10$$

$$(-1K)i_1 + (5.3K)i_2 - (3.3K)i_3 = 10-5$$

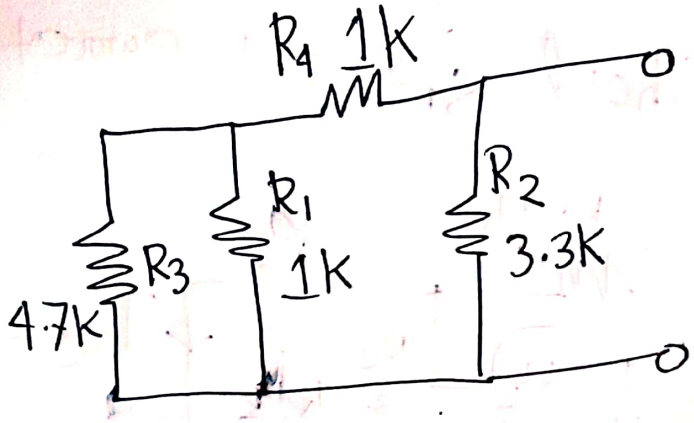
$$-(3.3K)i_2 + (3.3K)i_3 = 5$$

$$i_3 = 6.034\,mA$$

$$R_{Th} = \frac{V_{oc}}{I_{sc}} = \frac{7.089}{6.034\,m}$$

$$= 1174.843\,\Omega$$

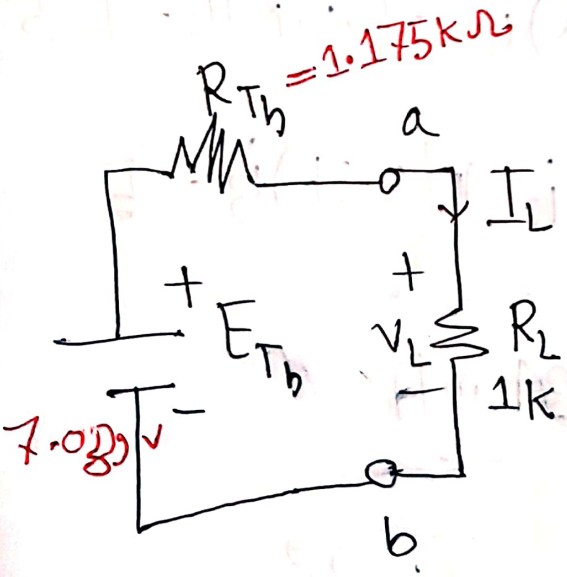
$$= 1.175\,K\Omega$$



$$R_{Th} = \left[(4.7k \,||\, 1k) + 1k \right] \,||\, 3.3k$$

$$= 1.824k \,||\, 3.3k$$

$$= 1.175 \text{ k}\Omega$$



$$I_L = \frac{7.089}{1.175k + 1k}$$

$$= \frac{7.089}{2.175k}$$

$$= 3.26 \text{ mA}$$

Figure4. Circuit diagram to verify Thevenin's Theorem