EXPERIMENT 3
APPLICATION OF THEVENIN AND NORTON THEOREMS

3.1 Objective

In this experiment, the application of Thevenin and Norton Theorems will be studied. Node and Mesh Analysis methods will be utilized.

3.2 Equipment List

- Multimeter,
- CADET,
- Carbon Resistors (two 1 kΩ, 1.8 kΩ, 3.3 kΩ, 33 kΩ,)

3.3 Preliminary Work

1.
i. Analyze the circuit given in Figure 1 using the Thevenin theorem and calculate the Thevenin equivalent voltage (E_{TH}) and resistance (R_{TH}) between a and b terminals, where R_1=3.3 kΩ, R_2=33 kΩ, R_3=R_4=1 kΩ

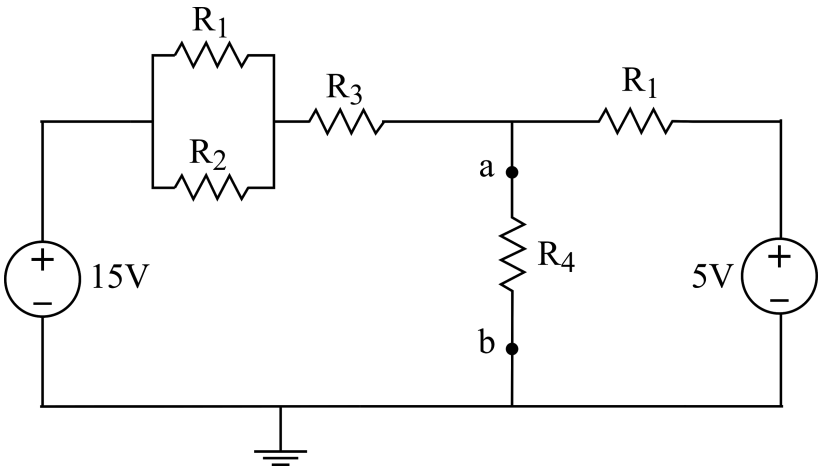


Figure 1

ii. Draw the Thevenin equivalent of the circuit in Figure 1 and calculate voltage and current values on R_4**.**

2.

i. Analyze the circuit given in Figure 2 using the Norton theorem and calculate the Norton equivalent current (I_N) and resistance (R_N) between a and b terminals where R_1=3.3kΩ, R_3=1kΩ, R_5=1.8kΩ.

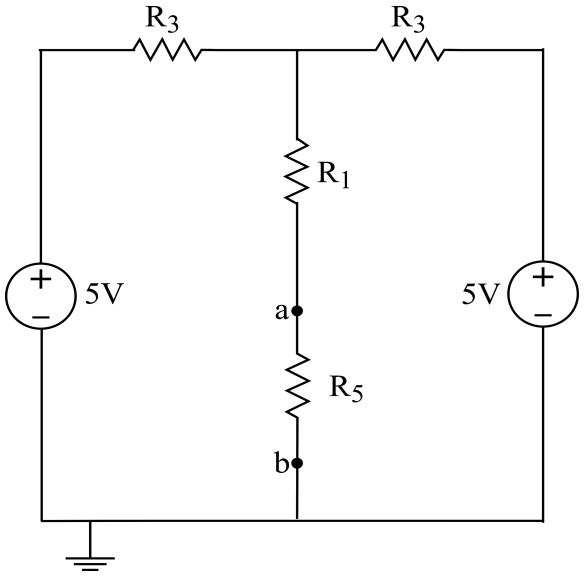


Figure 2

ii. Draw the Norton equivalent of the circuit in Figure 2 and calculate voltage and current values on R_5**.**

3.4 Experimental Work

Important Notice: Before finishing each work, show your workbench to conducting assistant for the signature.

1. Set the circuit in Figure 1 and measure the Thevenin equivalent voltage (E_{TH}) between a and b terminals after disconnecting R_4 from the circuit, as shown in Figure 3.

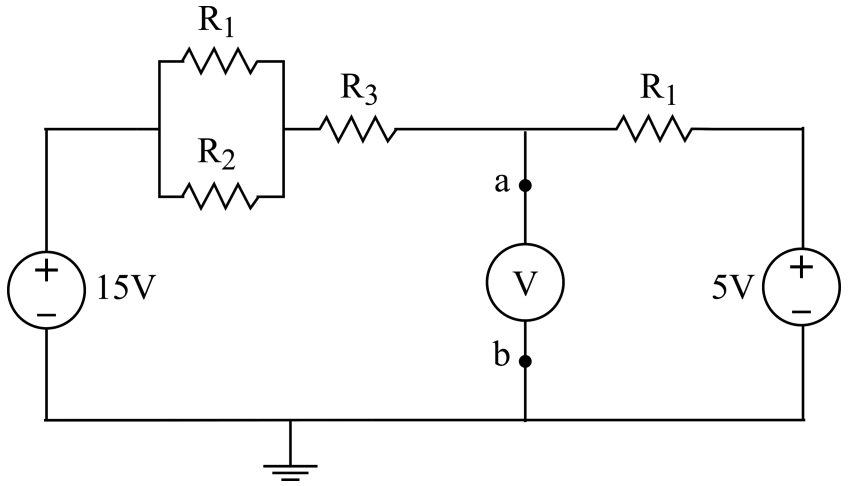


Figure 3

2. Set the circuit in Figure 1 and measure the Thevenin equivalent resistance (R_{TH}) between a and b terminals after short-circuiting all sources, as shown in Figure 4.

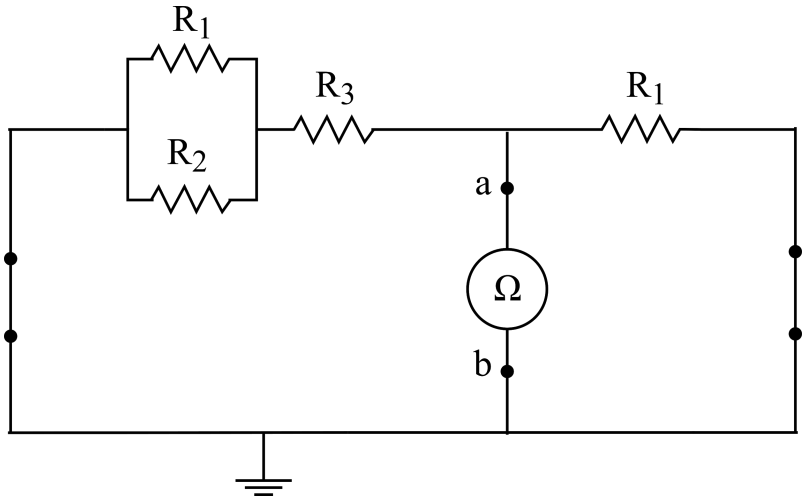


Figure 4

3. Set the circuit in Figure 1 and measure the voltage and current values on R_4.

4. Set the Thevenin equivalent circuit in Figure 5 and measure the voltage and current values on R_4. Compare your results with the previous step.

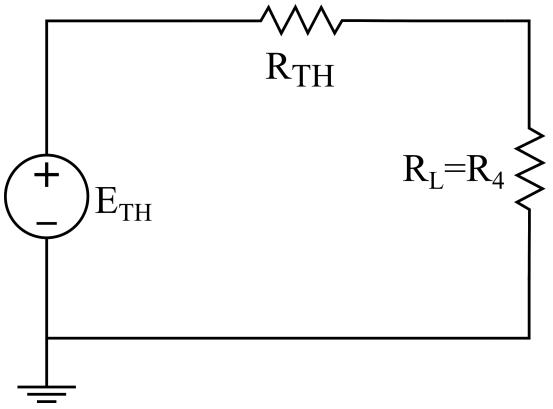
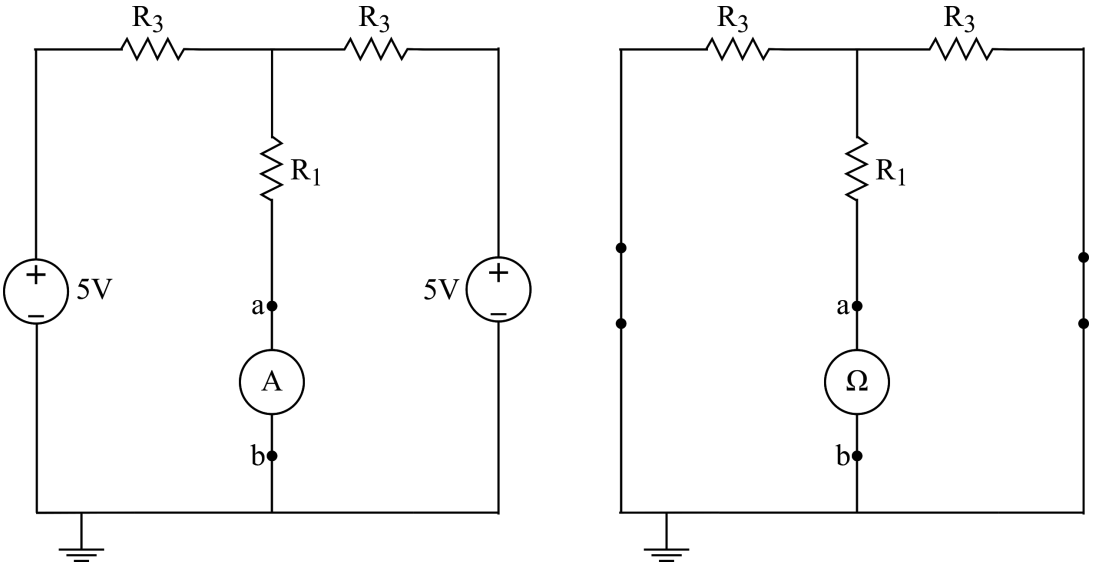


Figure 5

5. Set the circuit in Figure 2. Measure the Norton equivalent current (I_N) and equivalent resistance (R_N) between a and b terminals as shown in Figure 6.a and Figure 6.b, respectively. Compare your results with your calculations.



(a) **(b)**

Figure 6

6. Set the circuit in Figure 2. Measure the voltage and current values on R_5. Compare your results with your calculations.

7. Briefly discuss experimental results from Norton and Thevenin equivalent circuits.

EXPERIMENT 3
REPORT SHEET

Name & Surname :

Date :

Experimental Work:

1&2.

	Calculated	**Measured**
E_{TH}		
R_{TH}		

RA Signature:

3&4.

	Thevenin Equivalent Circuit		**Actual Circuit**	
	Calculated	**Measured**	**Calculated**	**Measured**
V_{R4}				
I_{R4}				

RA Signature:

5.

	Calculated	**Measured**
I_N		
R_N		

RA Signature:

6.

	Calculated	Measured
V_{R5}		
I_{R5}		

RA Signature:

7. Conclusion: