Solution for the Practice Problem

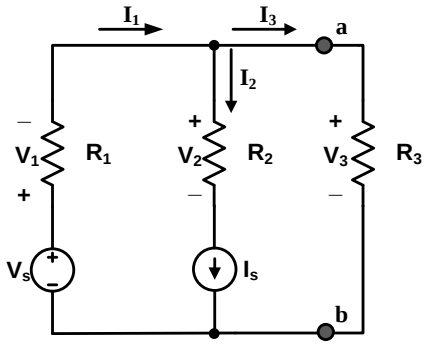
COURSE : ECS204 Basic Electrical Engineering Laboratory

1. Measure the exact values of R_1 to R_3.

R_1 = 0.820 kΩ

R_2 = 1.200 kΩ

R_3 = 2.200 kΩ



2. Connect the circuit in Figure 1. Record the exact values of V_S and I_S.

V_S = 15.00 V I_S = 12.00 mA

3. Measure voltage and current in the following table.

Only V_S is active				Only I_S is active				Both V_S and I_S are active			
I_1	4.97	V_1	4.07	I_1	8.74	V_1	7.17	I_1	14.00	V_1	11.24
I_2	0	V_2	0	I_2	12.00	V_2	14.40	I_2	12.00	V_2	14.40
I_3	4.97	V_3	10.93	I_3	-3.26	V_3	-7.17	I_3	1.71	V_3	3.76

- All current values are in mA. All voltage values are in V.

Remarks

- We use a power supply to create the current source I_S. The voltage V_{S2} of this power supply is adjusted so that the current (measured by the DMM) to it is I_S.
- The value of V_{S2} is 10.641 V for the case when both V_S and I_S are active. When only I_S is active, the power supply voltage V_{S2} should be 21.568 V.

4. Find the Thevenin equivalent circuit at R_3 by considering R_3 as a load.

V_{TH} = **5.16 V** R_{TH} = **0.820 kΩ**

- Remark: The value of V_{S2} (the voltage of the voltage source for the fake current source) should be 9.24 V.

5. I_N = **6.29 mA**

- Remark: The value of V_{S2} (the voltage of the voltage source for the fake current source) should be 14.4 V.

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