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Experiment 3:
Voltage Dividers and Thevénin's Theorem

In-Lab Report

A. Voltage divider circuits

Build the circuit and then record the measured values in the Table below, the bleeder current I_1, the voltages V_B and V_A, and the load resistance R_L for each of the load conditions in part A.

Measured Values					
V(V)	I_L (mA)	I_1 (mA)	V_B (V)	V_A (V)	R_L (Ω)
10	0	2.644	6.76	3.234	infinite
10	2	2.323	5.032	2.5109	2.519k
10	4	1.423	3.433	1.712	0.8595k
10	6	0.765	1.795	0.914	0.3065k

B. Voltage Divider Design

Connect the circuit. Measure the required voltages and currents and record them in a table.

Measured Values	
V_L(V)	4.369
I_L(mA)	2.860
$I_{bleader}$(mA)	1.935

C. Thevénin's Theorem

- Connect the circuit of Fig. C.3 and measure the open-circuit voltage between points A and B of this circuit.

Measured Value	
V_{TH}(V)	5.510

- With the 15 V source in Fig. C.3 replaced by a short -circuit, measure the resistance between the AB terminals with the digital multimeter.

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Measured Value	
$R_{TH}(\Omega)$	2.3606k

- Connect the load resistances of 1 KΩ and 4.7 KΩ in turn in the circuit of Fig.C.3 and measure the corresponding load voltages.

Measured Values	
	$V_{load}(V)$
1 KΩ	1.32
4.7 KΩ	3.65

- Find R_{TH} using the matched-load method; that is, use a 5 KΩ potentiometer as a variable resistance between the AB terminals of the circuit of Fig. C.3. Vary the resistance until load voltage drops to half of the measured V_{TH} (open-circuit voltage.) Then disconnect the load resistance and measure its resistance with the multimeter.

Measured Value	
$R_{TH}(\Omega)$	1.627k

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