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	2.777	6.613	3.312	infinity
10	2	2.085	4.971	2.49	2.5 kohms
10	4	1.406	3.346	1.67	831.3 ohms
10	6	0.704	1.673	0.838	301

B. Voltage Divider Design

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

Measured Values	
V_L(V)	4.44 V
I_L(mA)	3.004
$I_{bleader}$(mA)	2.026

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)	5.496 V

- 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.

Measured Value	
$R_{TH}(\Omega)$	2.37 Kohms

- 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	1.606
4.7 KΩ	3.656

- 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	
$R_{TH}(\Omega)$	2.28 kohm