

Name: _____ Lab Section: _____ Date: _____

OVERVIEW:

This laboratory introduces the concepts of parallel DC circuits. You will need a dc power supply, a Fluke 189 Digital MultiMeter (DMM), and four resistors. Your instructor will also instruct you with the proper operation of each. You will measure and record voltages and currents in a parallel dc circuit. From these measurements you will verify Kirchhoff's Current Law (KCL) and apply the Current Divider Rule (CDR).

CAUTIONS:

- Record all data in ink. Do not erase. Make corrections by drawing a line through the incorrect data and write the correct data next to the deleted data.
- Do not energize a circuit until your instructor or lab assistant checks it.
- Remove all power from a circuit before attempting to measure resistance in the circuit with an ohmmeter. Remember to disconnect the resistance from the circuit.
- Remove all power before making changes in a circuit.

PROCEDURE:

Your ability to measure and record your data in a neat and organized manner is important. Start a habit of being professional by using a lab notebook and generating tables.

1. Prepare the dc power supply for use by setting the current limit to 25 mA.
2. Measure and record the resistance of the following four resistors. Compare these measurements to the nominal values including their relative difference.

Resistor	Measured Value (K Ω)	Nominal Value (K Ω)	Relative Difference (%)
R ₁		6.8	
R ₂		10	
R ₃		27	
R ₄		33	

3. Connect the circuit in Figure 1.

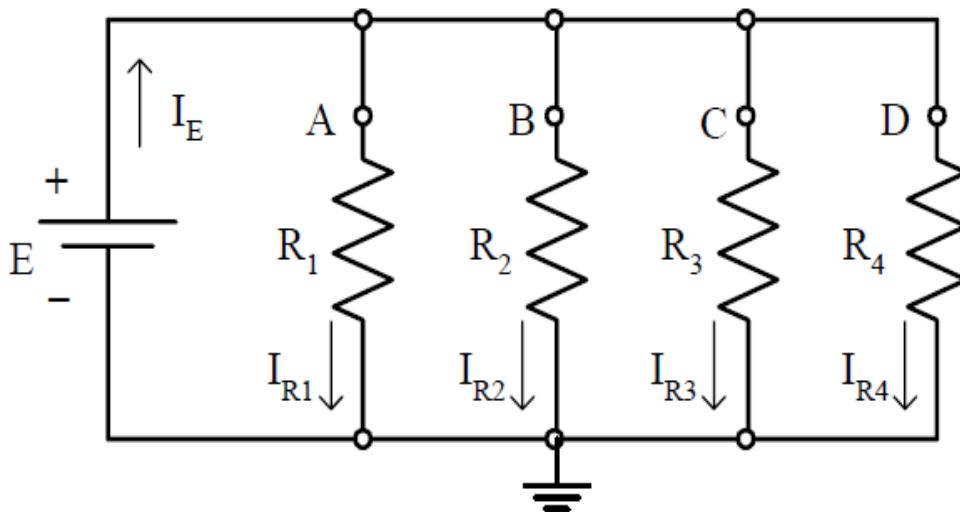


Figure 1. Parallel dc Circuit

- Now connect your power supply to the circuit. Set your power supply to 10 V after the circuit is connected. Remember to verify your voltage with the DMM.
- Measure and record the currents I_E , I_{R1} , I_{R2} , I_{R3} , and I_{R4} . Compare these to calculated values determined by using the nominal values of resistance.

	I_E	I_{R1}	I_{R2}	I_{R3}	I_{R4}
Measured					
Calculated Using Nominal Values					
Relative Difference					

- Compare the your current measurements to calculated values using the measured values of resistance.

	I_E	I_{R1}	I_{R2}	I_{R3}	I_{R4}
Measured					
Calculated Using Measured Values					
Relative Difference					

7. Do your measured currents verify Kirchoff's Current Law? Show your calculations and relative difference.

8. Measure and record the voltages V_A , V_B , V_C , and V_D . Compare all four of these voltages to E.

	V_A	V_B	V_C	V_D
Measured				
E				
Relative Difference				

9. Place a wire from point A to ground. Properly measure and record the resulting short current. Explain your measurement.

REPORTING:

Once you have completed your measurements, have your lab instructor check and sign off on your work. Clean up your bench, turn off and unplug all equipment at your bench, return all equipment to its proper location, clean all trash and debris off your bench and deposit it in the trash receptacle.

Turn in this completed lab worksheet at the end of lab.

Approved by: _____ **Date:** _____