NAME _____

EET 1150 Lab 7
Series-Parallel Circuits

OBJECTIVES:
> - Measure resistance, currents, and voltages in series-parallel circuits, and verify that the measured values agree with theoretical predictions.
> - Verify that Kirchhoff's laws, the voltage-divider rule, and the current-divider rule apply to series-parallel circuits.

PROCEDURE:

> 1. Select the resistors shown in Table A. Measure and record their actual resistances. **Throughout this lab, round all predicted values, measured values, and percentage errors to three significant digits.**

TABLE A: **Resistor Values**

Resistor I.D.	Nominal Value	Actual Value
R_1	4.7 kΩ	
R_2	1.5 kΩ	
R_3	2.2 kΩ	
R_4	5.6 kΩ	
R_5	10 kΩ	
R_6	1 kΩ	

> 2. The following pages contain diagrams of three series-parallel circuits. Use your knowledge of series-parallel circuits to predict the quantities listed in the table below each circuit diagram. Then build each circuit and measure the quantities. Record your measured values, along with percentage errors.
> 3. After completing all measurements, answer the questions listed below.

TECHNICAL CONCLUSION: Re-read the objectives at the beginning of this lab. For each objective, briefly state what you've learned from the lab. Include some discussion of how far off (percentage errors) your measured values were from your predicted values.
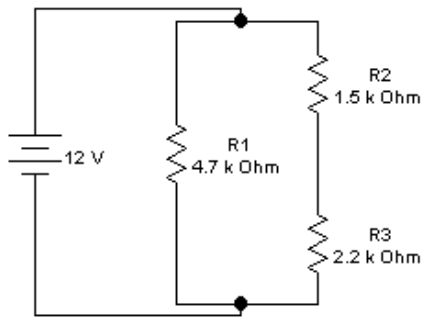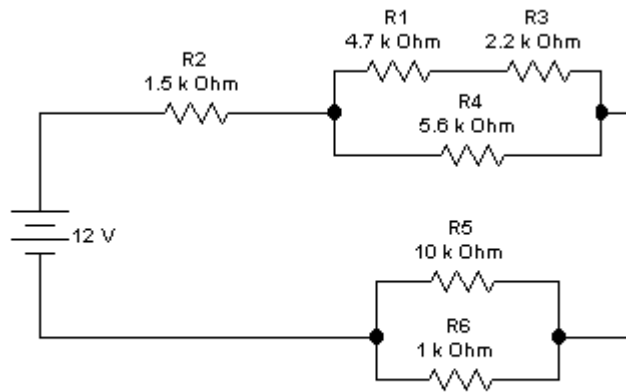
Circuit 1
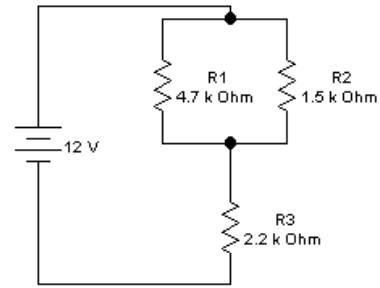
Circuit 2

TABLE B: Currents and Voltages in Circuit 1

Quantity	Calculated Value	Multisim Value	Measured Value	DMM Range Used	%Error(Col.2&4)
R_T					
I_T					
I_1					
I_2					
I_3					
V_1					
V_2					
V_3					

TABLE C: Currents and Voltages in Circuit 2

Quantity	Calculated Value	Multisim Value	Measured Value	DMM Range Used	%Error(Col.2&4)
R_T					
I_T					
I_1					
I_2					
I_3					
V_1					
V_2					
V_3					

Circuit 3

TABLE D: Currents and Voltages in Circuit 3

Quantity	Calculated Value	Multisim Value	Measured Value	DMM Range Used	%Error(Col.2&4)
R_T					
I_T					
I_1					
I_2					
I_3					
I_4					
I_5					
I_6					
V_1					
V_2					
V_3					
V_4					
V_5					
V_6					

QUESTIONS: (Type your answers on another sheet.)
1. Based on your data for Circuit 3, is the **voltage-divider rule** satisfied in this circuit? Explain, giving **one specific example** of how this rule either is or is not satisfied in that circuit, using actual *measured* values, not predicted values. As part of your answer, show your calculation, and discuss the percentage error between your calculated and measured values.
2. Repeat Question 1 for the **current-divider rule.**
3. Repeat Question 1 for **Kirchhoff's Voltage Law.**
4. Repeat Question 1 for **Kirchhoff's Current Law.**