Ohm's Law and Basic Measurements

Names: _____ and _____

SHOW ALL UNITS WHERE APPLICABLE!

Part 1

Get 10 resistors of the same value

1. List the colors on the resistor. _____ _____ _____ _____

2. What is the value of the resistor? _____

3. Use the multimeter to measure and record the values of each of the resistors in the table below.

4. Calculate the percent difference between the value for R you measured, and the theoretical value based on the color code. Write your answer in the table below.

$$\%error = \frac{Experimental - Theoretical}{Theoretical} \times 100\% \tag{1}$$

no.	Value	%error	no.	Value	%error
1.			6.		
2.			7.		
3.			8.		
4.			9.		
5.			10.		

Part 2

Given the voltage divider shown below

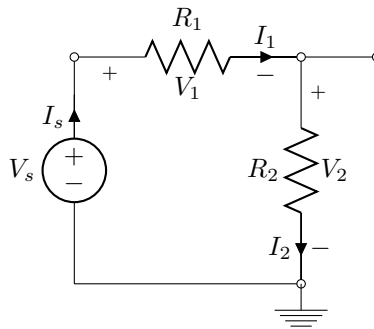Figure 1: Voltage divider

1. What is the relationship between I_1, I_2, and I_s? _____

2. Compute I_s as a function of V_s, R_1 and R_2.

3. If $R_1 = R_2$, what is V_2 and a function of V_s? _____

4. Build the circuit with $V_s = 5$V and $R_1 = R_2$, measure V_2. _____

5. Add a resistor in parallel to R_2 that is the same value, and measure V_2. _____

6. Add a resistor in parallel to R_2 that is at least 5 times the value, and measure V_2. _____

7. Can voltage divider circuit be used to supply a desired constant voltage V_2 to another circuit? If yes, under what conditions?

Part 3

1. What is a DC-DC converter?

2. What is the difference between linear and switching voltage regulators?