Title: **Ohm's Law** Lab: 2

Course: Electrical Applications Unit: Electrical Lab CLO: 2, 3, 4

Name ANSWER KEY Grade 13pts Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Objectives**

1. Student shall calculate electrical values of a simple circuit using Ohm’s Law
2. Student shall explain the process for measuring current and voltage with a multimeter.
3. Student shall measure current and voltage in a circuit using a multimeter.
4. Student shall describe the effects of altering circuit resistance and the resulting circuit current and power changes.

**Assessment**

Students shall demonstrate a comprehension of the objectives listed above by scoring a minimum of 75% on this Lab. Grading shall be based on instructor evaluation.

**Materials**

|  |  |
| --- | --- |
| Student Provided Materials | Department Provided |
| Proto-Board | Power Supply |
| Multimeter |  |
| 560Ω, 1.2kΩ Resistors |  |
| Calculator |  |

**Instructions**

Using the figure below, answer the following problems.

|  |  |  |
| --- | --- | --- |
|  |  |  |

Where;

Calculations

1. With R1 at 560Ω, calculate the current through the circuit. 17.857mA
2. Calculate the circuit power. 178.571mW
3. Change R1 to 1.2kΩ. Calculate the current flowing through the circuit. 8.333mA
4. How much power is dissipated in the circuit? 83.333mW

**Instructions**

|  |  |  |
| --- | --- | --- |
|  |  |  |

Where;

Measurements

Build the circuit shown above, using the 560Ω resistor as R1. Record the following measurements.

**WARNING:** Do not attempt to take any current readings without getting direction from the instructor first.

1. Measure and record the source voltage. \_\_\_\_\_\_\_\_\_\_
2. Measure and record the total circuit current. \_\_\_\_\_\_\_\_\_\_
3. Calculate the actual power dissipated by the circuit using current and voltage measurements. \_\_\_\_\_\_\_\_\_\_

Replace R1 with a 1.2kΩ resistor and record the following measurements.

1. Measure and record the total circuit current. \_\_\_\_\_\_\_\_\_\_
2. Calculate the actual power dissipated by the circuit using current and voltage measurements. \_\_\_\_\_\_\_\_\_\_

Evaluations

1. What factors are present that cause calculated and measured values to differ?

*Variances in source voltage output and/or resistance values*

1. Explain what happened to the current and power when the resistor was changed from the 560Ω to the 1.2kΩ resistor.

*Increasing the resistance makes the current go down.*

1. Explain the process for measuring current.

*Move red lead to the mA port and set meter to read milli-Amps. Open the circuit and place the multi-meter in series with the circuit.*

1. Explain the process for measuring voltage across a component.

*Move red lead to the V port and set meter to read volts. Ensure the circuit is a complete series circuit and place the multi-meter across the component(s)t to read volts.*