Title: **Short Circuit** Lab: 6

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

Name ANSWER KEY Grade 24pts. Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Objectives**

1. Student shall evaluate the effects of a short circuit.
2. Student explain the effects of a short within a series circuit.

**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 |  |
| Resistor/Wire kit |  |
| Calculator |  |

**Instructions**

Using the figure below, answer the following problems.

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

Calculations

Use the values in the drawing above to calculate the expected values and record in the table below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | P | I | R | E |
| R1 |  | 1.714mA | 2.7kΩ | 4.629V |
| R2 |  | 1.714mA | 1kΩ | 1.714V |
| R3 |  | 1.714mA | 3.3kΩ | 5.657V |
| Total |  | 1.714mA | 7kΩ | 12V |

**Instructions**

Using the figure below, measure and calculate the following values.

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

Measurements

Build the circuit shown above and record the measured values below.

ER1 \_\_\_\_\_\_\_\_\_\_ ER2 \_\_\_\_\_\_\_\_\_\_ ER3 \_\_\_\_\_\_\_\_\_\_ IT \_\_\_\_\_\_\_\_\_\_

Insert a jumper wire around R2. This will effectively “short” R2. Measure and record the requested values below.

ER1 \_\_\_\_\_\_\_\_\_\_ ER2 \_\_\_\_\_\_\_\_\_\_ ER3 \_\_\_\_\_\_\_\_\_\_ IT \_\_\_\_\_\_\_\_\_\_

Evaluation

1. Where the values measured before shorting R2 and after shorting R2 different? Yes / No
2. What was the effect on the circuit current?

*It eliminated R2 from the circuit.*

1. What is the effect on the voltage drop across R2?

It went to 0V

1. What is the effective characteristic of a “short” on a series circuit?

*Decreases resistance which increases the total current.*