Title: **Loaded Voltage Divider** Lab: 17

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

Name ANSWER KEY Grade 19pts. Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Objectives**

1. Student shall calculate loaded voltage divider circuit quantities using the characteristics of a series and a parallel circuit and a given *load*.
2. Student shall construct the circuit and analyze the results.

**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 Kit |  |
| Calculator |  |

**Theory**

A loaded voltage divider is an active series-parallel circuit that produces an output load voltage (EL) that is a fraction of its input voltage (ES). Voltage division is the result of distributing the input voltage among the components of the divider. A simple example of a loaded voltage divider is two resistors connected in series, with the input voltage applied across the resistor pair and the output load emerging from the connection between them. Resistive loaded voltage dividers are commonly used to supply a reduced voltage to a specific load from a higher given source voltage.

**Circuit**



Where;

**Instructions**

Calculations

1. Compute the following values based on the Ohm’s Wheel and the information given on the pervious page.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | P | I | R | E |
| R1 | 76.409mW | 18.667mA | 220Ω | 4.1V |
| RB | 40mW | 2mA | 10kΩ | 20V |
| RL | 333.333mW | 16.667mA | 1.2kΩ |
| Total | 449.742mW | 18.667mA | 1.291kΩ | 24.1V |

Measurements

1. Construct the circuit on the previous page. Take measurements and complete the table below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | P | I | R | E |
| R1 |  |  |  |  |
| RB |  |  |  |  |
| RL |  |  |  |  |
| Total |  |  |  |  |

Evaluations

1. What would be the effect of increasing the value of RB on IT?
   1. Go Up
   2. Go Down
   3. Stayed the same
2. What would be the effect of increasing ES on EL?
   1. Go Up
   2. Go Down
   3. Stayed the same
3. What would be the effect of increasing RL on EL?
   1. Go Up
   2. Go Down
   3. Stayed the same