Title: **Voltage Dividers** Worksheet: 14

Course: Electrical Applications Unit: Electrical Theory CLO: 3

Name ANSWER KEY Grade 17pts Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Objectives**

1. Student shall determine the voltage drop of any resistor within a voltage divider.
2. Student shall recognize the function of a voltage divider and how it is useful in control systems.
3. Student shall distinguish the characteristics of a voltage divider separate from that of a plane series circuit.

**Assessment**

Students shall demonstrate a comprehension of the objectives listed above by scoring a minimum of 75% on this Worksheet. Grading shall be based on an answer key.

**Theory**

The simplest voltage divider is a series circuit that contains two resistors and has a load of a specific voltage attached at the junction of the two resistors (see schematic below). In this circuit, the source voltage is divided in two, with the ratio of division being determined by the value of the resistors. To determine the voltage across either of the two resistors, the following formula can be applied.

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

To determine the size of either of the resistors in the circuit, the following formula can be applied;

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

If the source voltage is 10V, but the voltage required at point “A” is 8V, a voltage divider can be created to supply the required voltage. If the circuit has a total current of 250mA determine the resistor values using the above formulas.

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

Where;

**Instructions**

Use the schematic and information below to complete the following values.



Where;

Complete the table below for the parameters and calculated values listed above.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | P | I | R | E |
| R1 | 2.5W | 500mA | 10Ω | 5V |
| R2 | 20W | 500mA | 80Ω | 40V |
| Total | 22.5W | 500mA | 90Ω | 45V |

Use the above schematic and new information below, complete the following values.

Where;

Complete the table below for the parameters and calculated values listed above.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | P | I | R | E |
| R1 | 25W | 1A | 25Ω | 25V |
| R2 | 75W | 1A | 75Ω | 75V |
| Total | 100W | 1A | 100Ω | 100V |

1. If a load was added at point “A”, what would be the effect on the output voltage from point “A”?
   1. Increase
   2. Decrease
   3. Remain the same