Experiment #3

Circuit Analysis

EENG 275 - W01

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**Experiment Objectives**

* Check for Node Voltage Method
* Check for Mesh Current Method
* Check for Thevenin Theorem
* Check for Norton Theorem
* Check Superposition Theorem

**Equipment Used**

1- NYIT supplied Lab Kit

1- Digital Multi-meter (DMM)

1- DC Power Supply

1 -100 Ω Resistor 1- 510 Ω Resistor

1- 1 kΩ Resistor

1- 1.5 kΩ Resistor

1- 2.2 kΩ Resistor

1- 3.3 k Ω Resistor

1- 4.7 kΩ Resistor

1- 5.1 kΩ Resistor

1- 10 kΩ Resistor

1- 15 kΩ Resistor

2- 6.8 kΩ Resistor

**Results**

|  |  |
| --- | --- |
| V1 | 5v |
| V2 | 13.15v |
| V3 | 7.12v |
| I1 | 7.57A |
| I2 | 20.10A |
| I3 | 10.77A |

*Circuit of Figure 3 .1*

|  |  |
| --- | --- |
| Rth | 765 |
| Vth | 15.11v |
| Il | 0.01A |

*Circuit of Figure 3.2*

|  |  |
| --- | --- |
| Rn | 4770 |
| In | 0.01A |
| Il | 0.01A |

Circuit of Figure 3.3

|  |  |
| --- | --- |
| V1 | 1.4v |
| V2 | 2.1v |
| V3 | 8.52v |
| V4 | 1.57v |
| I1 | 1.41A |
| I2 | 1.41A |
| I3 | 1.41A |
| I4 | 3.10A |

Circuit of Figure 3.4

**Questions**

1. How does the measured value compare with the theoretical equivalent resistance you found?

- For figure 3.3 the theoretical equivalent resistance was smaller than the measured equivalent resistance.

2. More than likely, the two values don’t agree. What other sources of resistance might be present in your circuit? How might you test for them?

- The built-in resistance from the DMM and from the Breadboard, we can measure by the measured difference of resistance as it goes across a series of resistors in parallel or in series.

3. Are the two circuits really equivalent? If the circuits were both enclosed in a “black box”, would you be able to tell them apart based on your measurements?

- No, because the measurements differ between the measured and theorical.

**Conclusion**

There was a difference in measurements possibly due to inbuilt resistance of the DMM and the breadboard. Thus, if enclosed in a box or some other type of containment device it would be hard to identify the circuit given the difference in measurements.