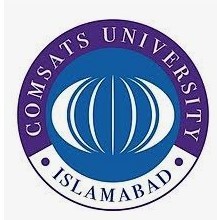
**Electric Circuit Analysis I EEE-121**

Lab 02



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| --- | --- |
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#### Measurement Section:Task-1

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **V**  **(volts)** |  | **R = 1.8K Ω** | | **R = 2.2K Ω** | | | **R = 4.71K Ω** | | |
| **I (mA)**    **Measured** | **I (mA)**    **Calc**  **ulated** | **I (mA)**    **Simulated** | **I (mA)**    **Measured** | **I (mA)**    **Calc**  **ulated** | **I (mA)**    **Simulated** | **I (mA)**    **Measured** | **I (mA)**    **Calc**  **ulated** | **I(mA)**    **Simulated** |
| **0.5** | 0.307 | 0.27 | 0.27 | 0.23 | 0.20 | 0.20 | 0.123 | 0.106 | 0.106 |
| **1.0** | 0.590 | 0.56 | 0.56 | 0.495 | 0.45 | 0.45 | 0.220 | 0.212 | 0.212 |
| **1.5** | 0.872 | 0.83 | 0.83 | 0.709 | 0.68 | 0.68 | 0.341 | 0.318 | 0.318 |
| **2.0** | 1.130 | 0.11 | 1.11 | 0.930 | 0.90 | 0.90 | 0.435 | 0.424 | 0.424 |
| **2.5** | 1.380 | 1.38 | 1.38 | 1.154 | 1.13 | 1.13 | 0.555 | 0.530 | 0.530 |
| **3.0** | 1.690 | 1.66 | 1.60 | 1.396 | 1.36 | 1.36 | 0.665 | 0.636 | 0.636 |
| **3.5** | 1.926 | 1.94 | 1.94 | 1.629 | 1.60 | 1.60 | 0.774 | 0.743 | 0.743 |
| **4.0** | 2.341 | 2.22 | 2.22 | 1.856 | 1.82 | 1.82 | 0.876 | 0.894 | 0.894 |
| **4.5** | 2.610 | 2.50 | 2.50 | 2.190 | 2.24 | 2.24 | 0.998 | 0.955 | 0.955 |
| **5.0** | 2.900 | 2.78 | 2.78 | 2.490 | 2.27 | 2.27 | 1.094 | 1.060 | 1.060 |

**Table 1**

## Post-Lab Tasks:

1. Plot the values Measured in the lab with voltage on x-axis and current on y-axis on graph paper.

1. Answer the following Questions?

1. *What is the advantage of using LTSPICE in circuit analysis?*

*ANSWER:*

**LTspice provides schematic capture to enter an electronic schematic for an electronic circuit, an enhanced SPICE type analog electronic circuit simulator, and a waveform viewer to show the results of the simulation. We can calculate the value of current passing through a circuit easily because in this circuit software can draw a circuit with the required resistance and then we calculate the current passing through the circuit easily without any error.**

1. *What would happen if a wire having no resistance at all (0 Ω) was connected directly across the terminals of a 6 volt battery? How much current would result, according to Ohm’s Law?*

**6 V**

**+**

**-**

### *ANSWER;*

### **As ohm law states that:**

**V=IR**

**That would be a short short circuit According to ohm’law infinite current would flow through the wire after some time wire would melt due to infinite current passing through the circuit**.

1. *How would you place a DC current source with downward direction on LTSPICE schematic?*

*ANSWER:*

* **Click the component button in the toolbar.**
* **A new “select component symbol” window will open.**
* **Click OK.**
* **Place it on the schematic using left click**

1. *When you simulate the circuit in LTSPICE, the magnitude of current through all elements is same; however, negative sign appears with current through voltage source. What is the reason?*

*ANSWER:*

**In conventional current , we take positive terminal from where current enters and negative as from where current leaves, for the voltage source the current leaves from positive terminal and enters from negative terminal. The sign will be negative due to passive convention that’s why negative sign appears with**

## Critical Analysis / Conclusion

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| --- |
| **From doing an experiment practically I conclude that using simulation software such as LTSPICE can make our work easier because in this software we can easily make a circuit and if error occurred they are corrected at that time before doing physically and in this software , we don’t need physical equipments for testing and also concluded that if voltage is increased across a fixed resistor current flowing through it will increases mean we can see verification of ohm’s law by using simulation software.**  **SIMULATION SOFTWARE(LTSPICE) can make our work easier and 100% accurate and and we can use it free of cost.** |