**Lab - 5 Datasheet**

**Circuit Analysis – I**

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| --- | --- |
| Student Name(s) |  |
| Date Lab Performed: |  |

## **Task 1: Construct the Complex DC Circuit and Measure all Branch Voltages**

Use a DMM to measure the branch voltages of the circuit in Fig. 1 as specified in Table 1.

**Table 1 - Branch Voltages of Complex DC Circuit (Fig. 1)**

|  |  |  |
| --- | --- | --- |
| **Branch Voltage Term** | **Branch Voltage Value** | **Nodal Voltage Expression** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Note:** The measured value must be measured using the DMM and not read from the power supply unit’s display.

## **Task 2: Write an Expression for Each Branch Voltage in terms of Nodal Voltages**

Fill in each cell of the Nodal Voltage Expression column of Table 1 with an expression that represents the Branch Voltage Term in terms of the relevant nodal voltage(s).

## **Task 3: Measure all Branch Currents**

Use a DMM to measure the branch currents of the circuit in Fig. 1 as specified in Table 2.

**Table 2 - Branch Currents of Complex DC Circuit (Fig. 1)**

|  |  |  |
| --- | --- | --- |
| **Branch Current Term** | **Branch Current Value** | **Mesh Current Expression** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Note:** The measured value must be measured using the DMM and not read from the power supply unit’s display.

## **Task 4: Write an Expression for Each Branch Current in terms of Mesh Currents**

Fill in each cell of the Mesh Current Expression column of Table 2 with an expression that represents the Branch Current Term in terms of the relevant mesh current(s).

### **Task 5: Error Calculations**

Calculate the % error for the nodal voltages and mesh currents measured and fill in Table 3 and Table 4, respectively.

**Table 3 – Error Calculations for Nodal Voltages of Complex DC Circuit (Fig. 1)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Nodal Voltage Term** | **Theoretical Value** | **Measured Value** | **% error** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

**Note:** The theoretical voltage values are obtained from Table 3 of the Prelab-5 Worksheet.

**Table 4 – Error Calculations for Mesh Currents of Complex DC Circuit (Fig. 1)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Mesh Current Term** | **Theoretical Value** | **Measured Value** | **% error** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

**Note:** The theoretical current values are obtained from Table 3 of the Prelab-5 Worksheet.

Within the given space, show step-by-step **% error calculations** for , :

**Note:** You will still need to do % error calculations for the other parameters and complete Tables 3 – 4, but you do not need to show all calculations here. Show % error calculations only for and .

|  |
| --- |
|  |

## **Task 5:**

**Conclusions:** (min 150 words. Max 300 words)

**Lab-5 Datasheet Submission Requirements**

* Make sure to write a thoughtful conclusion in the **Conclusions** section summarizing your key observations and learnings from this lab. Conclusions should be at least **150 words** long. Conclusions section is worth 5 points (the lab is worth total 100 points – Prelab: 30 pts, Hands-on Lab: 70 pts).
* **File format:** Once this Datasheet is complete, **save/convert** this word file **as a .pdf file** having a filename as: “Lab-5 Datasheet\_FirstName of Student 1\_FirstName of Student 2.pdf”. For example, if name of the two students performing the lab in a group are Tom Cruz and Morgan Freeman, respectively, then the Lab-5 Datasheet file should have the following name: “Lab-5 Datasheet\_Tom\_Morgan.pdf”.
* Check with your lab instructor about specific instructions on how to submit your Lab-5 Datasheet for assessment and grading.