**LAB REPORT NO 7**

**Complex Circuit Analysis Using PSPICE**

**INTRODUCTION**

In this lab we will find and apply kvl and kcl to the complex circuit to find and verify these laws also calculate current entering and leaving the circuit also find total voltage and voltage drop across each resister will be equal. We have to verify the ohms law at each and every point in the circuit where needed.

**OBJECTIVES**

There are several benefits of kirchoff’s current law kirchoff’s voltage law and ohm’s law some of them are given below.

1. Discuss how Kirchhoff’s Current Law and voltage law applies to Series and Parallel Circuits.
2. Calculate Current drops in Parallel Circuit.
3. Calculate Voltage drops in Series Circuit.

**STATEMENT**

This law is also called Kirchhoff's first law, Kirchhoff's point rule, or Kirchhoff's junction rule (or nodal rule).

The principle of conservation of electric charge implies that:

At any node (junction) in an electrical circuit, the sum of currents flowing into that node is equal to the sum of currents flowing out of that node.

**Ohm’s law:**

Ohm's law states that the current through a conductor between two points is directly proportional to the voltage across the two points. Introducing the constant of proportionality, the resistance, one arrives at the usual mathematical equation that describes this relationship.

Mathematical Expression:

**V = I R**

**PROCEDURE**

Following steps will be followed while doing this experiment.

* Open a Pspice manager software while clicking on that particular icon.
* Then make a workspace where you want to save your files.
* Then click on run schematic button new windows will open in which you can design an circuit diagram.
* In the above figures we can see that we have found the node voltages and mesh current.
* Then place resisters of specific value with desired design making loops and nodes.
* Then apply mesh current law and node voltage law we will find the value of each and every point.
* For conformation new window will open which will show the message with zero error.
* After that we could imagine and predict that sum of valtages is equal to Vs and all the current is equal to Is.

**OBSERVATIONS AND CALCULATIONS**

**FOR CURRENT**

After all calculation we get the final result which is shown below in table.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Node** | **I1** | **I2** | **I3** | **I4** | **I5** | **I6** | **Ienter** | **Ileaving** | **Ie=Il** |
| 1 | 1.4 | 0.6 | 0.3 | 0.3 | 0.2 | 0.2 | 1.4 | 1.4 | 1.4 |
| 2 | 0.6 | 0.3 | 0.2 | 0.3 | 1.4 | 0.2 | 1.4 | 1.4 | 1.4 |

**FOR VOLTAGE**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Mesh** | **V1** | **V2** | **V3** | **V4** | **Ve** | **VI** | **Ve=Vl** |
| 1 | 1.46 | 1.46 | 1.46 | 5 | 5 | 5 | Equal |

**CONCLUSION**

The voltage across the resistance can be found by subtraction of low voltages to high voltages

The entering current is equal to the sum of current out through a node.

The voltage enter is also equal to the voltage out.