LAB NO: 07

TO ANALYZE A DC CIRCUIT USING MESH ANALYSIS TECHNIQUE

OBJECTIVE:

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THEORY:

MESH:

The smallest loop around a subset of components in a circuit is called mesh.

Or

Mesh can also be defined as; Loop within in a loop.

Or

Mesh is a loop which doesn't contain any other loop in it.

MESH ANALYSIS:

Technique to find voltage drops around a loop using the currents that flow within the loop, Kirchhoff's Voltage Law, and Ohm's Law. Multi-source DC circuits may be analyzed using a mesh current technique. The process involves identifying a minimum number of small loops such that every component exists in at least one loop. Kirchhoff's Voltage Law is then applied to each loop. The loop currents are referred to as mesh currents as each current interlocks or meshes with the surrounding loop currents. As a result there will be a set of simultaneous equations created, an unknown mesh current for each loop. Once the mesh currents are determined, various branch currents and component voltages may be derived.

STEPS FOE MESH ANALYSIS:

1. Identify all of the meshes in the circuit.
2. Label the currents flowing in each mesh.
3. Label the voltage across each component in the circuit.
4. Write the voltage loop equations using Kirchhoff's Voltage Law.

5. Use Ohm's Law to relate the voltage drops across each component to the sum of the currents flowing through them.

6. Solve for the mesh currents

7. Once the mesh currents are known, calculate the voltage across all of the components**.**

APPARATUS:

- Digital multi-meter
- DC power supply
- Resistors
- Connecting wires

SCHEMATIC DIAGRAM:

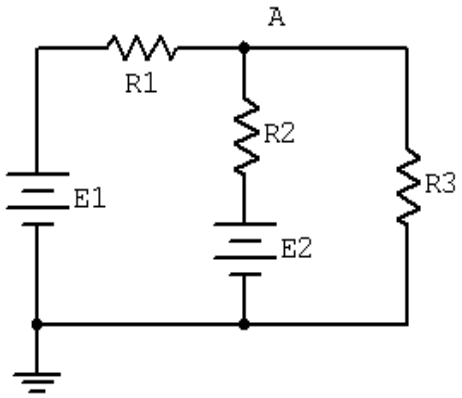

Figure 7.1: Circuit Diagram

PROCEDURE:

CALCULATIONS:

Parameters	Theoretical	Practical
V_A		
I_{R1}		
I_{R2}		
I_{R3}		

Table 7.1

CONCLUSION:

POST LAB QUESTIONS:

1. What is the difference between mesh and loop?

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2. What is meant by supermesh?

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3. What is mesh analysis used for?

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Teacher Remarks:

Obtained Marks: _____ / 10