Lab Report – 02

EEE -1103 (Electrical Circuit Lab)

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Experiment No.2:

Name of the Exp: Finding the current of the following circuit.

Objective: To find the total current of the given circuit in fig.1 using Ohm's law theoretically and experimentally for the given circuit.

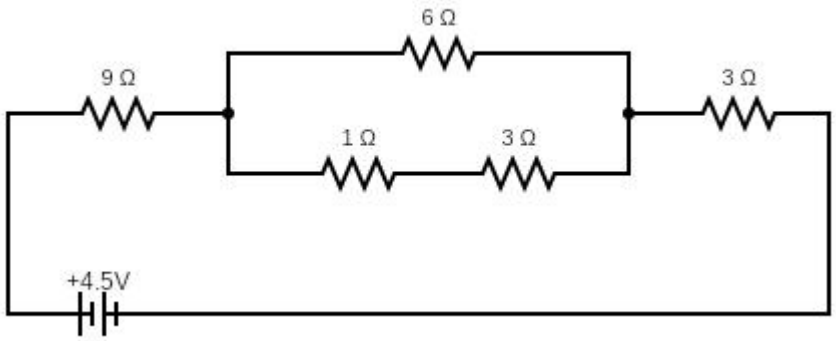

Fig.1

Theory: In this experiment we are using the well-known Ohm's law. Ohm's law states that *"the current through a resistor is directly proportional to the voltage across the two points"*

That is, $I = \frac{V}{R}$

Apparatus:

1. DC power supply
2. Resistors
3. Digital multi meter
4. Bread board
5. Connection wire

Procedure:

1. Check the values of the resistor using multi-meter (ohm section of multi-meter). Record the values in Table -1.
2. Give the connection as per the circuit diagram shown in Fig.1.
3. Set a particular value in DC power supply.
4. Measure the current in the circuit and record their values in Table -2.
5. Sum up the voltmeter readings i.e., voltage drops that should be equal to applied voltage.
6. Repeat the same for different voltages if needed.
7. Verify Ohm's law for each set of data.

Model Calculation: **(**For theoretical and measured value**)**

Theoretical:

Here, $V = 4.5V$, $R_1 = 9\Omega$, $R_2 = 6\Omega$, $R_3 = 1\Omega$, $R_4 = 3\Omega$, $R_5 = 3\Omega$

we need to find, $I = ?$

Step 1: at first, we need to simplify the circuit. We can do that by merging all the resistance let's start that with R_3 and R_4

→ since R_3 and R_4 in series so,

$$R_3 + R_4 = 1\Omega + 3\Omega = 4\Omega$$

→ Now R_2 and $R_{(3+4)}$ are in parallel so,

$$\frac{1}{R_2} + \frac{1}{R_{(3+4)}} = \frac{1}{6\Omega} + \frac{1}{4\Omega} = \frac{4+6}{6\times 4} = \frac{6\times 4}{4+6} = 2.4\Omega$$

→ Now R_1 , $R_{(2+3+4)}$ and R_5 are in series so,

$$R_1 + R_{(2+3+4)} + R_5 = 9\Omega + 2.4\Omega + 3\Omega = 14.4\Omega$$

Here we've found the total resistance, $R_T = 14.4\Omega$

Now we can come in the main calculation of determining the current which is,

$$I = \frac{V}{R_T} = \frac{4.5}{14.4} = 0.3125A$$

Measured:

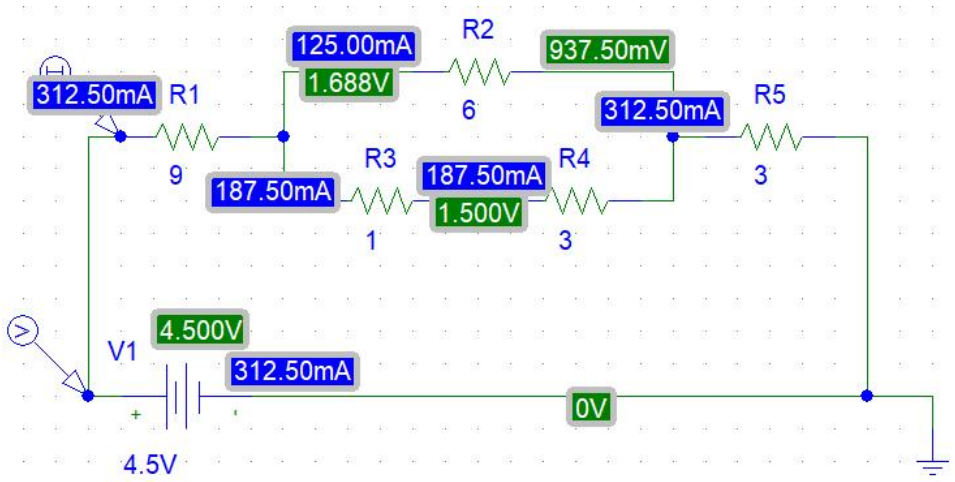

Fig 2.

We find that the measured value for current flowing through is

$$I = 312.50mA = 0.3125A$$

Result:

The result for theoretical and measured value is given below:

Table 1:

Resistors	R_1	R_2	R_3	R_4	R_5
Ohm meter reading	9Ω	6Ω	1Ω	3Ω	3Ω

Table 2:

Serial No.	V(v)	I(A)	
1		TV	MV
	4.5	*0.3125*	*0.3125*

The theoretical and measured value for this circuit is the same so we can say the main current through the circuit is, $I = 0.3125A$

Precautions:

1. Check for proper connections before switching ON the power supply.
2. Take care of the reading the apparatus.
3. The terminal of the resistance should be properly connected.