Lab Report 01

Course Title: Electrical Circuits Laboratory

Course Code: EEE 202 lab

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Experiment Name: Familiarization with resistor's color code and verification of Ohm's Law

Objectives:

This experiment is intended to

To determine the value of a selection of resistors using three different methods:

a. Using the color codes (to give the nominal value)
b. Using the digital Ohmmeter.
c. To verify the Ohm's Law.

Learning Outcome:

Students will be able to calculate the value of resistor and they will get practical understanding of Ohm's law.

Theory:

Ohm's Law: At Constant temperature current through a conductor is directly proportional to voltage applied across it.

$I \alpha V$

Or, $I = GV$

Where, V = Voltage across the conductor & I = Current through the conductor

Where, $G = \frac{1}{R}$ Conductance of the Conductor

And R = Resistance of the Conductor

$I = \frac{V}{R}$

Or, $R = \frac{V}{I}$

According to the Law $R = \frac{V1}{I1} = \frac{V2}{I2} = \frac{V3}{I3} = \frac{V4}{I4} = \frac{V5}{I5}$

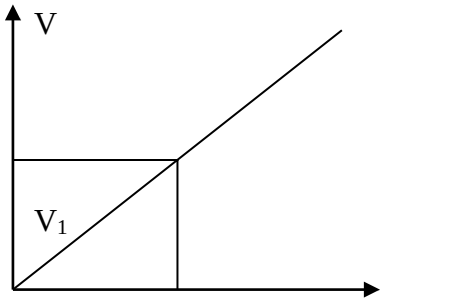
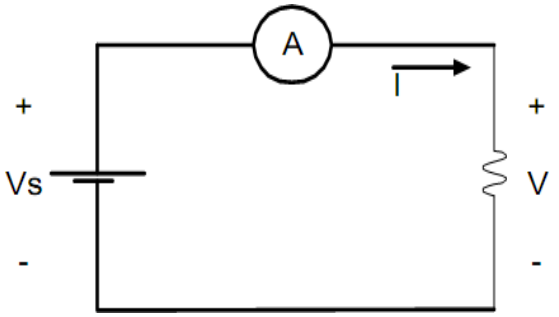


Figure 2.

List of Equipment:

1. DC Power Supply(12V)
2. Resistors: 100 Ω , 470 Ω , 1 KΩ, 2.2KΩ, 3.3 KΩ and 10 KΩ
3. DC Voltmeter(0-450 V)
4. DC Ammeter(0-10 A)
5. Connecting wires

Circuit Diagram:



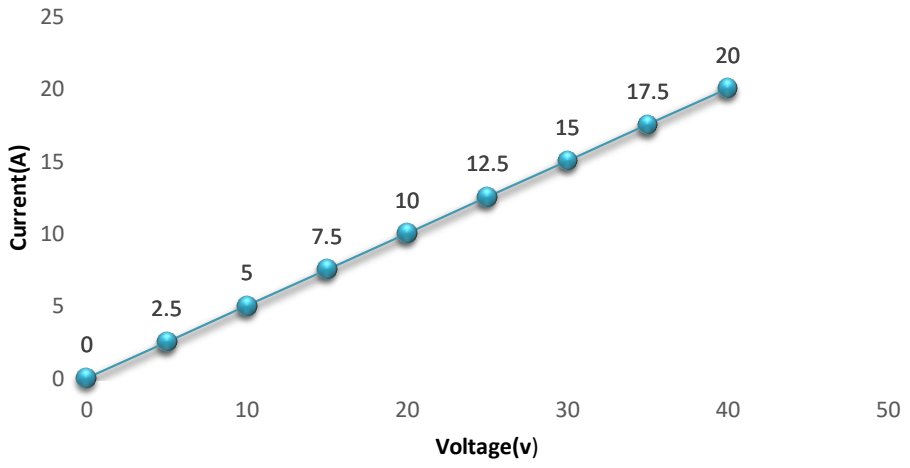
Data table-2:

Voltage	Current	Resistance $v\ (R = t$
0	0	0
5	2.5	2.5
10	5	5
15	7.5	7.5
20	10	10
25	12.5	12.5
30	15	15
35	17.5	17.5
40	20	20

Calculation:

Calculate $\frac{V1}{I1}, \frac{V2}{I2}, \frac{V3}{I3}$.

Graph:



Result:

From the above calculation we can see that, the resistance is 2Ω for different voltage and current values. Hence current and voltage hold a direct relationship for resistive components. This verifies ohm's law.

Discussion:

There's only less percentage difference in getting the resistance. Some of the resistors used in the experiment changes when measured using the multitester. This is maybe because of its tolerances. However, the percentage difference in voltage has a high result due to the supply used in the experiment. The supply used was not regulated and also we used analog multi-tester. Reading measurements using analog multi-tester may not be accurate. In current, there's zero percentage result in series connection. The theoretical value and the experimental value have match. (in series form, current of all the resistors used are the same). While in parallel and in seriesparallel, the percentage difference has a high result.