


Course Code: CSE 124  
Course Title: Basic Electrical Engineering Lab  
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Batch & Section: 62nd (A)

Lab Classes	Topics Covered	Date	Teacher's Signature
Lab 1	Verification of Ohm's Law	19-05-25	
Lab 2			
Lab 3			
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## EXPERIMENT NO: 01

### NAME OF THE EXPERIMENT:

VERIFICATION OF OHM'S LAW

### OBJECTIVE:

Our objective is to –

- Verify Ohm's Law
- Know the relationship between current, voltage and resistance connected to a circuit.

### THEORY:

The Ohm's law states that, the voltage across a resistor is directly proportional to the current flowing through the resistor, when temperature is constant.

Therefore,

$$V = IR$$

where,

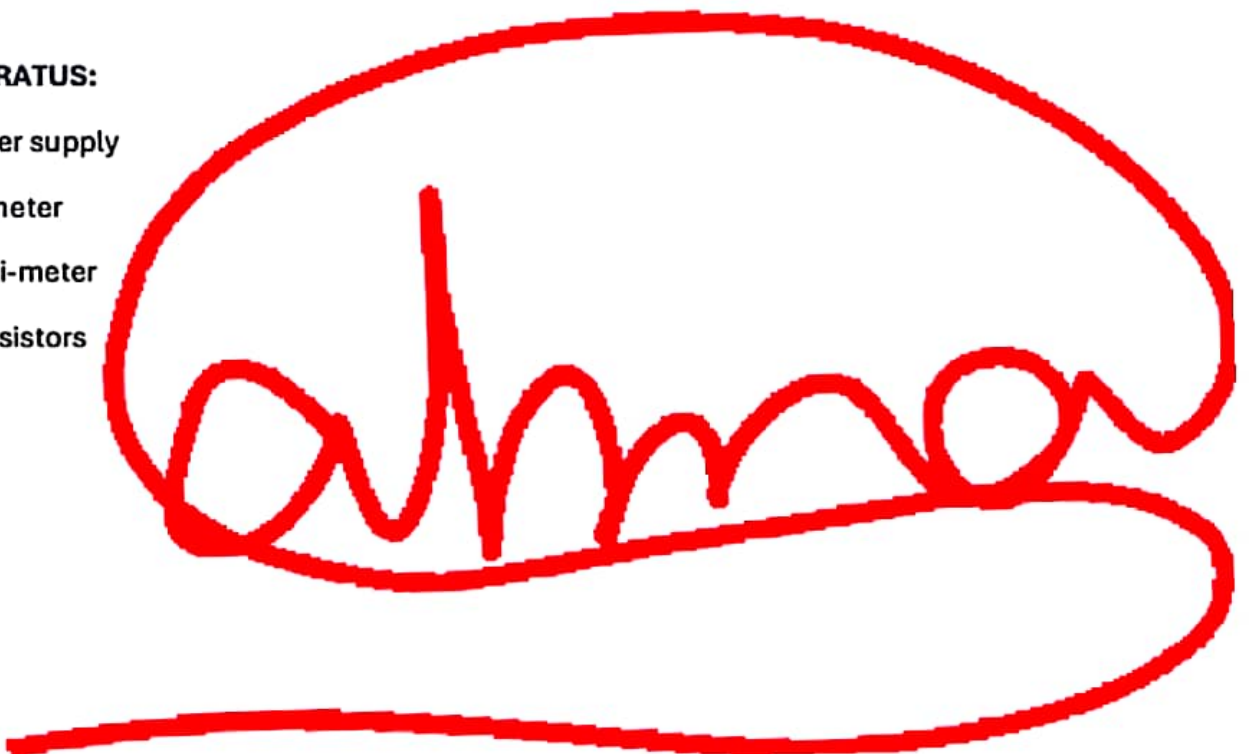
V = Voltage

I = Current Flow

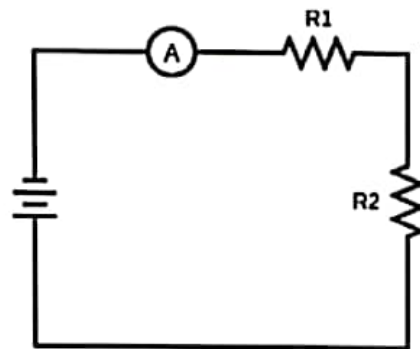
R = Resistance

### APPARATUS:

- Power supply
- Ammeter
- Multi-meter
- 2 Resistors



**CIRCUIT DIAGRAM:**



From figure, we can write equivalent resistance

$$R_{eq} = R_1 + R_2$$

$$\text{Circuit current, } I = V / R_{eq}$$

So,

$$\text{Voltage across } R_1 = V_1 = I * R_1$$

$$\text{Voltage across } R_2 = V_2 = I * R_2$$



**DATA TABLE:**

Source Voltage	R1 (Ω)	R2 (Ω)	V1 (Volt)	V2 (Volt)	I (mA)
10	462	460	5.1	5.1	10.7
5			2.67	2.66	5.9
15			7.76	7.74	16.1

**CALCULATION:**

Using Ohm's Law,

For source voltage 10V,

$$V1 = IR1$$

$$= 10.7 \times 462$$

$$= 4.943 \text{ V} \sim 5.1 \text{ V}$$

$$V2 = IR2$$

$$= 10.7 \times 460$$

$$= 4.922 \text{ V} \sim 5.1 \text{ V}$$

For source voltage 5V,

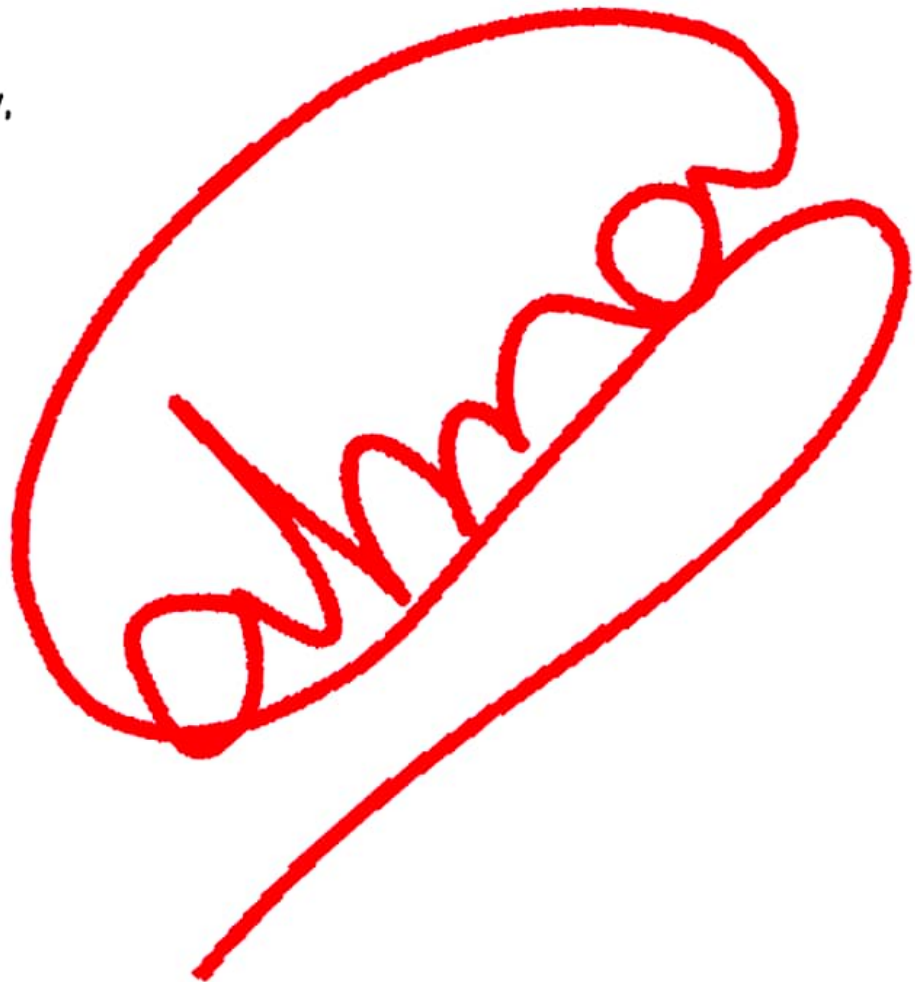
$$V1 = IR1$$

$$= 5.9 \times 462$$

$$= 2.725 \text{ V} \sim 2.67 \text{ V}$$

$$V2 = IR2$$

$$= 5.9 \times 460$$



$$= 2.714 \text{ V} \sim 2.66 \text{ V}$$

For source voltage 10V,

$$V_1 = IR_1$$

$$= 16.1 \times 462$$

$$= 7.438 \text{ V} \sim 7.76 \text{ V}$$

$$V_2 = IR_2$$

$$= 16.1 \times 460$$

$$= 7.406 \text{ V} \sim 7.74 \text{ V}$$



#### DISCUSSION:

To verify the Ohm's law, at first, we measured the current flow through the resistors

This part should be unique for everyone, so it's private.

too small to ignore.

#### PROBLEM:

1. Among which things does Ohm's Law give a relationship?

Solution: The Ohm's law defines the relationship between current, voltage and the resistance of a circuit. It states that, the voltage is directly proportional to the current when resistance is constant.

2. Input current to a transistor is  $20\mu\text{A}$ . Applied voltage is  $24\text{mV}$ . Find input resistance.

Solution: From Ohm's law,

$$V = IR$$

$$\text{or, } R = V / I$$

$$R = 24\text{mV} / 20\text{ }\mu\text{A}$$

$$R = 1200\text{ }\Omega \quad (\text{Ans})$$

3. Plot "I vs. V" curve for Ohm's Law using experimental values.

Solution: Here is the plot of Current vs Voltage of the experimental circuit:

