

Circuits And System 1

CSE103L Circuits & Systems-I Lab

LAB REPORT # 4



Submitted to:

Engr. Faiz Ullah

Submitted by:

TAYYABA

Registration No:

19PWCSE1854

Semester: 2nd

Class Section: C

“On my honour, as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work.”

Student Signature: _____

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Department of Computer Systems Engineering

University of Engineering and Technology, Peshawar

VERIFICATION OF OHM'S LAW

Objectives

- To get familiar with breadboard
- To verify ohm's law using breadboard

Ohm's Law

Ohm's Law is the mathematical relationship among electric current, resistance, and voltage. The principle is named after the German scientist Georg Simon Ohm.

In direct-current (DC) circuits, Ohm's Law is simple and linear. Suppose a resistance having a value of R ohms carries a current of I amperes. Then the voltage across the resistor is equal to the product IR . There are two corollaries. If a DC power source providing E volts is placed across a resistance of R ohms, then the current through the resistance is equal to E/R amperes. Also, in a DC circuit, if E volts appear across a component that carries I amperes, then the resistance of that component is equal to E/I ohms.

Mathematically,

Ohm's Law for DC circuits can be stated as three equations:

$$E = IR$$

$$I = E/R$$

$$R = E/I$$

When making calculations, compatible units must be used. If the units are other than ohms (for resistance), amperes (for current), and volts for voltage), then unit conversions should be made before calculations are done. For example, kilohms should be converted to ohms, and microamperes should be converted to amperes.

APPARATUS

The apparatus used in this lab is consisted of

- Breadboard
- Connecting Wires
- Digital Multimeter
- Power Supply
- Resistors

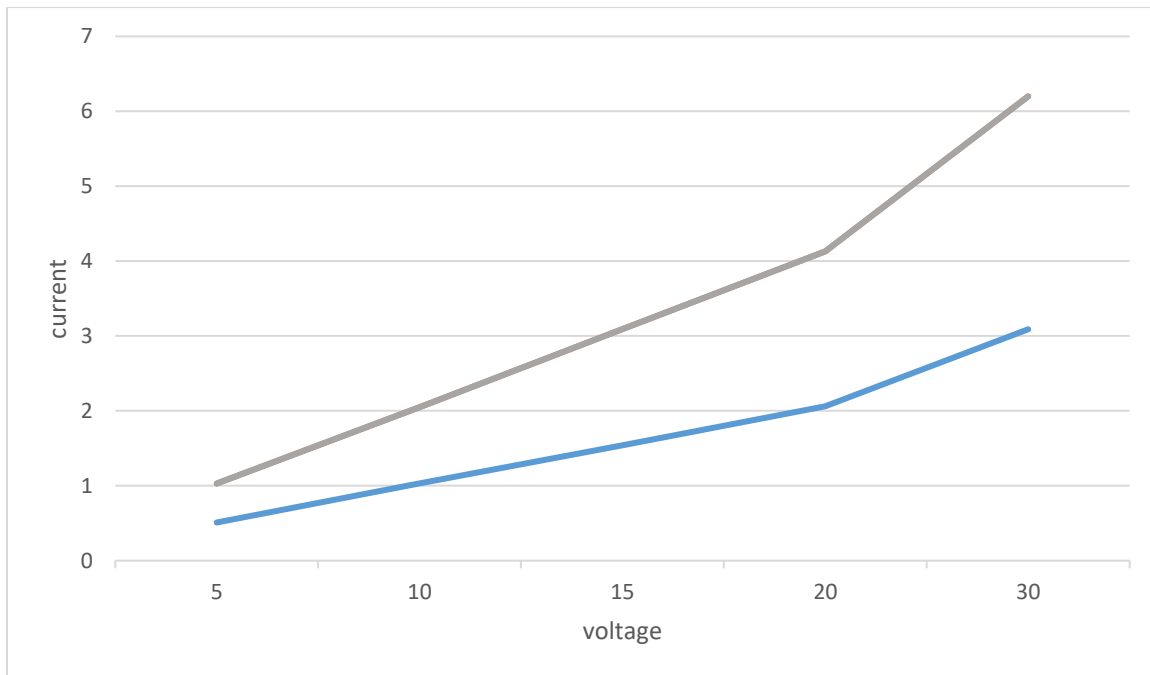
PROCEDURE

- Select the resistor and measure the value with the help of multimeter and color codes.
- Measure and write down the applied voltage by connecting digital multimeter across (parallel) power supply.
- When the values of resistance and voltage across resistance are known, find the actual value of current by using ohm's law.
- Vary voltage from the power supply, repeat step 3 and 4 and fill up the observation table.
- We also find the theoretical value of current by using ohm's law and for different voltages.
- Compare the practical and theoretical value and find out error if any also write reasons of error.
- Draw graph between measured values of current and applied voltage

OBSERVATIONS AND CALCULATIONS

Theoretical			Practical			Error
V	R	I	V	R	I	
5V	9.7K Ω	0.000515	6.12V	9.7K Ω	0.000525	1.9%
10V	9.7K Ω	0.00103	10.42V	9.7K Ω	0.00102	0.9%
15V	9.7K Ω	0.00154	17.85	9.7K Ω	0.00155	0.6%
20V	9.7K Ω	0.00206	22.1V	9.7K Ω	0.00207	0.4%
30V	9.7K Ω	0.00309	31.8V	9.7K Ω	0.00311	0.6%

GRAPH



CONCLUSION

It can also be seen from graph that increasing voltage, the current also increases and ohm's law is also verified. In this experiment breadboard is used and ohm's law is verified using breadboard.