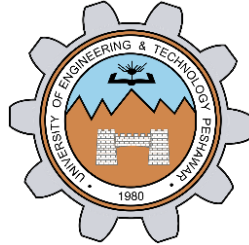


## INTRODUCTION TO LAB EQUIPMENT

### LAB REPORT # 01



**Spring 2023**

**CSE103L Circuits & Systems-I Lab**

Submitted by: **Naveed Ahmad**

Registration No: **22pwcse2165**

Class Section: **B**

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

Student Signature: \_\_\_\_\_

Submitted to:

**Dr. Muniba Ashfaq**

Mar 4, 2023

Department of Computer Systems Engineering  
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- **EQUIPMENT**

- Breadboard
- Multimeter
- Resistor
- Voltage source

- **OBJECTIVES**

In lab #1 we learnt about breadboard, multimeter, resistor and voltage source, how to use these equipment, how to make connection on breadboard, how to measure voltage, resistance etc. by mean of multimeter.

## Bread Board

A breadboard is a device used for prototyping electronic circuits. It consists of a plastic board with numerous small holes that are connected internally by metal strips. These holes allow electronic components to be easily inserted and connected without the need for soldering.

The breadboard is typically divided into two sections, each containing rows of interconnected holes. The top and bottom rows of each section are usually used for power and ground connections, while the other holes are used for connecting components.

Breadboards are often used by hobbyists and engineers to quickly and easily test circuit designs before they are built into a final product. They are also useful for educational purposes, as they allow students to learn about electronics without the need for advanced equipment or specialized knowledge.

Overall, breadboards are a versatile tool for prototyping and testing electronic circuits, and are an essential component of any electronics lab or workshop.



*Fig 1 bread board*

## MULTIMETER

A multimeter, also known as a volt-ohm meter (VOM), is an electronic measuring instrument that combines several measurement functions in one device. It is commonly used by electricians, electronic technicians, and hobbyists to measure voltage, current, resistance, and other electrical quantities.

A typical multimeter has two probes, one red and one black, that are connected to the device under test. The user selects the desired measurement function (e.g. voltage, current, resistance) and range using the dial on the front of the device, and then reads the measured value on the digital or analog display.

There are two main types of multimeters: analog and digital. Analog multimeters use a needle to indicate the measurement value on a scale, while digital multimeters display the value in numerical digits on an LCD screen.

In addition to basic measurement functions, many multimeters also offer additional features such as continuity testing, diode testing, and temperature measurement. Some advanced multimeters also offer features such as data logging, Bluetooth connectivity, and programmable settings.



*Fig 2 multimeter*

## RESISTOR

A resistor is an electronic component that is used to resist the flow of electric current in a circuit. It is a passive component, which means that it does not require any external power source to function. Resistors are widely used in electronic circuits to control the flow of current, to limit the amount of current that passes through a particular component, or to reduce the voltage level of a signal.

The resistance of a resistor is measured in ohms ( $\Omega$ ), and it determines how much current will flow through the resistor when a voltage is applied across it. Resistors are typically made of materials that have a high resistance to the flow of current, such as carbon, metal, or ceramic.

Resistors come in many different shapes and sizes, and they can be fixed or variable. Fixed resistors have a specific resistance value that cannot be adjusted, while variable resistors can be adjusted to change their resistance value. Some common types of resistors include carbon composition resistors, metal film resistors, and wirewound resistors.

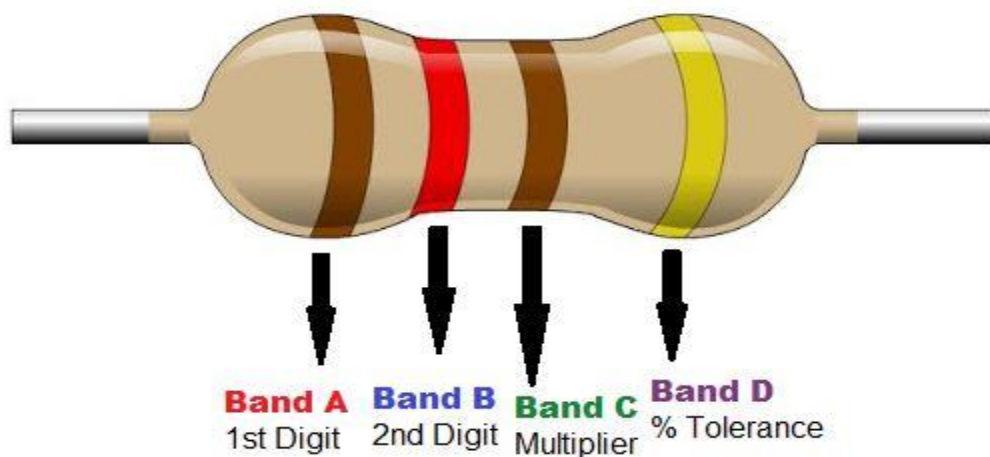


Fig 3 resistor

## VOLTAGE SOURCE

A voltage source is an electronic component or device that generates a specific voltage level between two terminals or nodes, and maintains that voltage level regardless of the amount of current flowing through it or the load connected to it.

Voltage sources are often used in electronic circuits to power and control other components, such as resistors, capacitors, and transistors.

There are two main types of voltage sources: DC (direct current) and AC (alternating current) voltage sources. A DC voltage source maintains a constant voltage level, while an AC voltage source generates a periodic waveform that oscillates between positive and negative voltage levels.

Voltage sources can be found in a wide range of electronic devices, from small battery-powered devices to large power grids that supply electricity to entire cities.

Common examples of voltage sources include batteries, power supplies, generators, and solar panels.



*Fig 4 voltage source*

### OBSERVATION AND CALCULATION;

S no	Actual value	Measure value	Resistance ( $\Omega$ )	Current (A)	%error= $\left\{ \frac{\text{Actual value} - \text{Measure value}}{\text{Actual value}} \right\} \times 100$ .
1	+5	+5.27	7 $\Omega$	0.714 A	+5.41%
2	-5	-5.27	7 $\Omega$	0.714 A	-5.41%
3	+10	+10.25	47 $\Omega$	0.212 A	+2.5%
4	-10	-10.25	47 $\Omega$	0.212 A	-2.5%
5	+15	+15.46	42 $\Omega$	0.35 A	+3.06%

## LAB RUBRICS: (Circuits & Systems-I Lab)

Criteria & Point Assigned	Outstanding 4	Acceptable 3	Considerable 2	Below Expectations 1
<b>Attendance and Attentiveness in Lab</b>  PLO10	Attended in proper Time and attentive in Lab	Attended in proper Time but not attentive in Lab	Attended late but attentive in Lab	Attended late not attentive in Lab
<b>Equipment / Instruments Selection and Operation</b>  PLO1, PLO2, PLO3, PLO5,	Right selection and operation of appropriate equipment and instruments to perform experiment.	Right selection of appropriate equipment and instruments to perform experiment but with minor issues in operation	Needs guidance for right selection of appropriate equipment and instruments to perform experiment and to overcome errors in operation	Cannot appropriately select and operate equipment and instruments to perform experiment.
<b>Result or Output/ Completion of target in Lab</b> PLO9,	100% target has been completed and well formatted.	75% target has been completed and well formatted.	50% target has been completed but not well formatted.	None of the outputs are correct
<b>Overall, Knowledge</b> PLO10,	Demonstrates excellent knowledge of lab	Demonstrates good knowledge of lab	Has partial idea about the Lab and procedure followed	Has poor idea about the Lab and procedure followed
<b>Attention to Lab Report</b> PLO4,	Submission of Lab Report in Proper Time i.e. in next day of lab., with proper documentation.	Submission of Lab Report in proper time but not with proper documentation.	Late Submission with proper documentation.	Late Submission Very poor documentation