

Experiment date : 30-12-2024

Experiment No: 01

Experiment Name: familiarization with different equipment of EEE circuit lab.

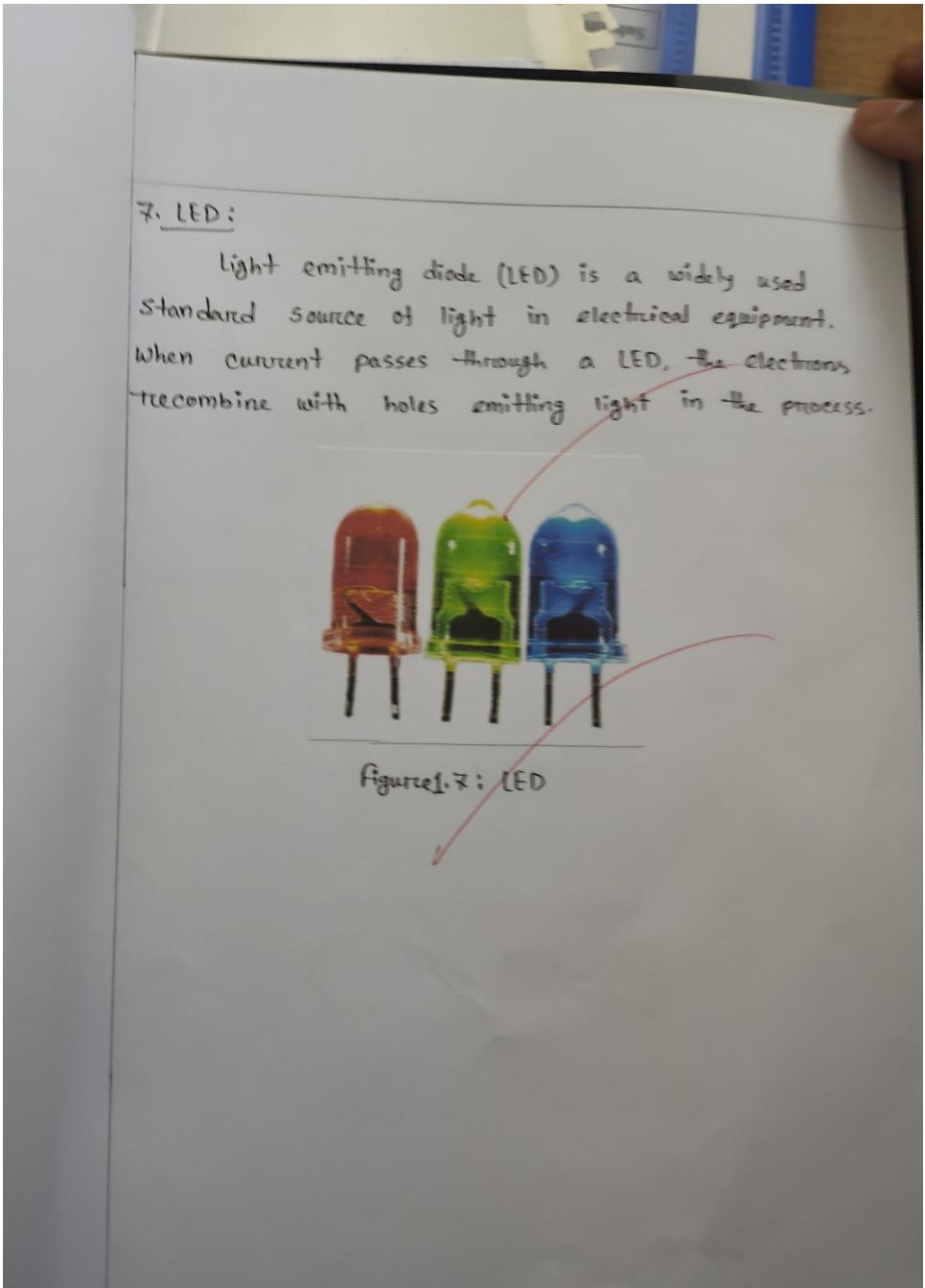
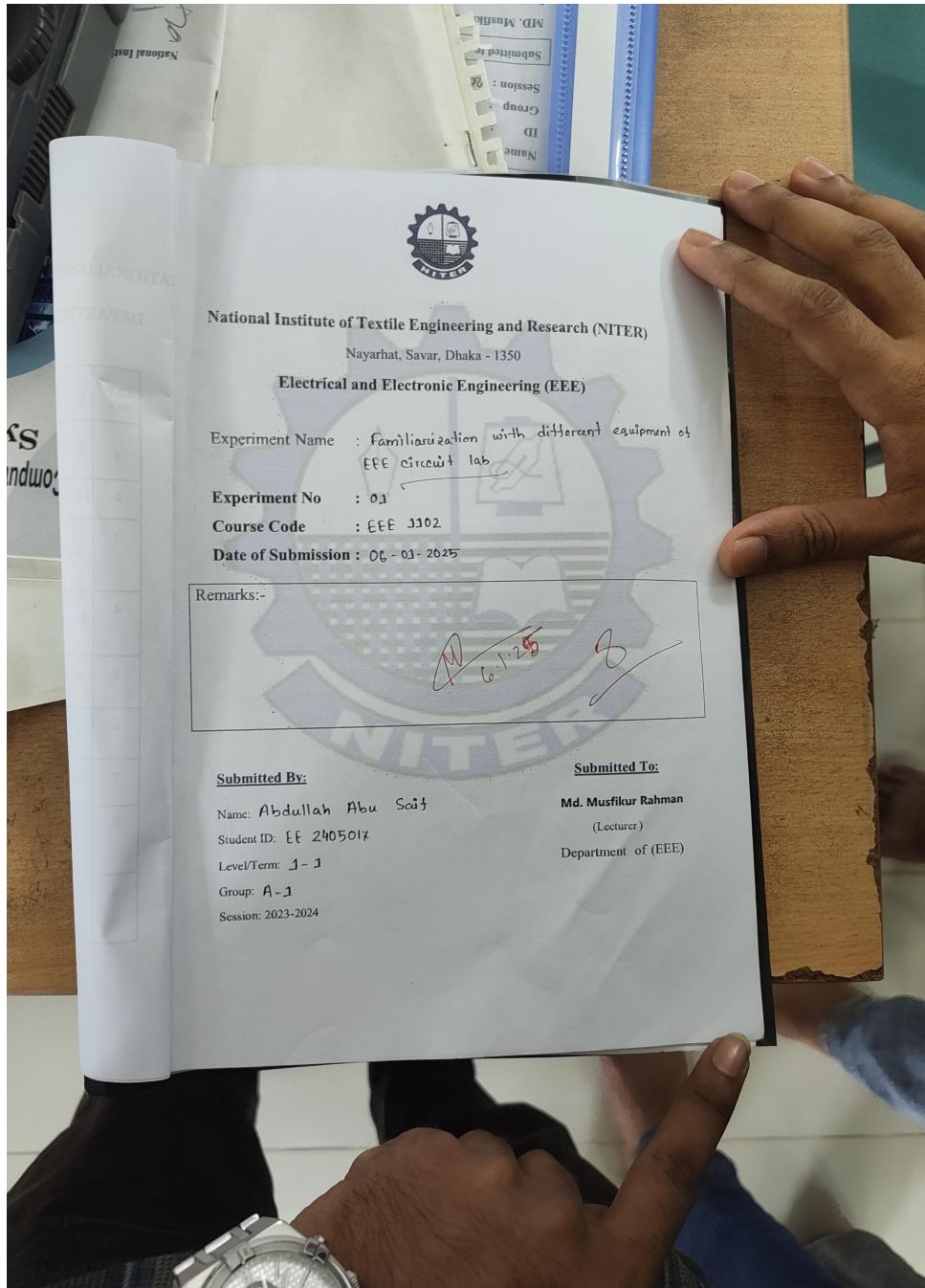
Introduction: There are two types of elements in an electric circuit - active elements and passive elements. An active element supplies ~~area~~ energy. A voltage source or a battery is an active element. The emf of a battery is measured using the unit Volt (V). A passive element absorbs energy. The resistance of a resistor is measured using the unit Ohm (Ω). There are two fundamental circuit variables - current through circuit element and voltage across a circuit element. The current through a circuit element is measured using the (A) and voltage across a circuit element is measured using the unit volt (V).

Digital Training Board:

analog training system is an ideal all types of electric circuits.



Figure 2.10: Digital and Analog Training Board



i. DC Voltage Source:

DC current is defined as a directional current. In case of DC current the electrons on the current flow in one direction. It does not change its direction like AC current. Normally we use battery and other electric cell as DC voltage source. It is portable as well as DC voltage source we can use without connecting main power line.



Figure 1.8: DC voltage source

ii. Oscilloscope:

An oscilloscope is a type of electronic instrument that graphically displays varying electrical voltages as two dimensional plot of one or more signals as function of time. An oscilloscope can display alternating current or pulsating direct current wave front having a frequency as low as approximately 3Hz or as high as several MHz.



figure 1.11 : Oscilloscope

5. Voltmeters:

A voltmeter is an instrument that measures the difference in electrical potential between two points in an electric circuit. An analog voltmeter moves a pointer across a scale in proportion to the circuit's voltage.

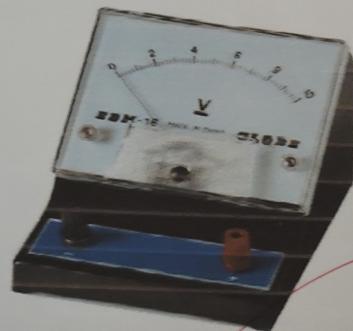


Figure 1.5: voltmeter

12. Function Generators:

A Function Generator is usually a piece of electronic test equipment or software used to generate different types of electric waveforms over a wide range of frequencies. Some of the most common waveform produced by the function generators are the sine, square, triangular shapes. These waveforms can be either repetitive or single shot. Integrated circuits used to generate waveforms may also be described as function generator ICs.



Figure 1.12: Function Generator

Objective:

1. To observe the various parameters of the electric circuit.
2. To observe the different instrument which are usually need for measurement.
3. To understand the use of the instrument and components in experiment.
4. To be familiar with the equipments of electric circuit lab.

Name of different equipment :

1. Resistor
2. Inductors
3. Capacitors
4. Multimeters
5. Voltmeters
6. Ammeters
7. LED
8. DC voltage source.
9. Bread Board
10. Trainer Board (Analog & Digital)
11. Oscilloscope
12. Function Generators
13. Transformer

13. Transformer:

Transformer is a device that transfers electric energy from one alternating current to one or more other circuits, either increasing (stepping up) or reducing (stepping down) the voltage. A transformer transfers of electric energy from one circuit to another. Transfer of electrical power through electromagnetic induction. And also electric power transfer without any change in frequency.

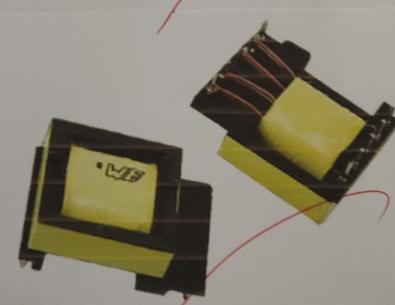


Figure 1.13: Transformer

Conclusion:

In this lab, we studied about some of the basic lab equipments that can measure resistance, voltage, capacitance and current respectively. It also helps us to gather idea on these devices how they can work.

1. Bread Board:

A bread board is solderless basic circuit board. It is used to make temporary circuit by connecting of electric circuit. It doesn't require any soldering. In case of bread board, we can easily ~~effect~~ any component in bread board. For this reason, bread board is widely popular.

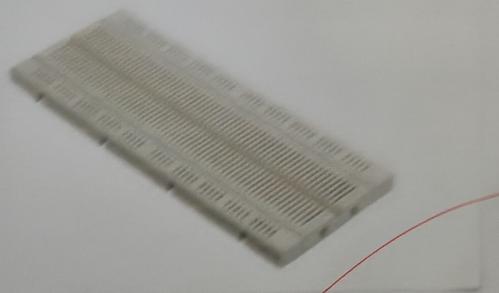


Figure 1.1: Bread board

2. Inductor:

An inductor is a passive electronic component that temporarily stores energy in a magnetic field when electric current through the inductor's coil. An inductor has the functions of developing electromotive force in the direction that reduces fluctuation when a fluctuating current flows and storing electric energy as magnetic energy.

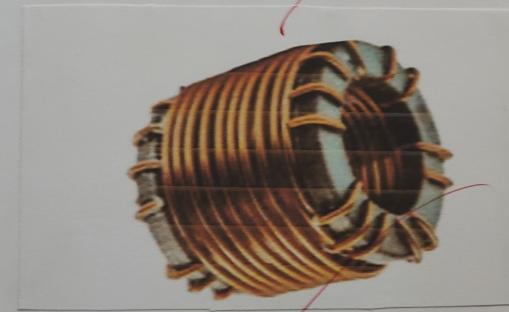


figure 1.2 : Inductor

3. Capacitor:

A capacitor is a two terminal electrical device that can store energy in the form of an electric charge.

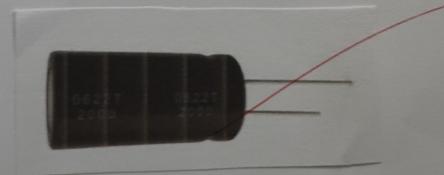


Figure 1.3 : Capacitor

4. Multimeters:

A multimeter is an important instrument for electric measurement. It can measure current flow and voltage both. It can also measure resistance. A multimeter also known as volt-ohm meter. It can measure various electrical properties because its unit is equipped with voltmeters, ammeter and ohmmeter functionally.



figure 1.4 : Multimeters

6. Ammeter:

An ammeter measures the electric current in a circuit. The name is derived from the name for the SI unit for electric current, amperes (A).

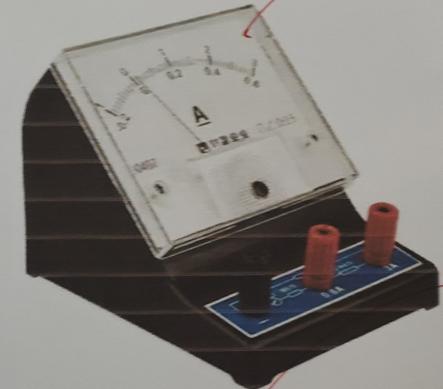


figure 1.6 : Ammeter.

Equipment of electrical circuit lab:

1. Resistors:

A resistor is a two terminal electric circuit component. Generally, it is used to reduce the current flow. It is also used to many purpose such as to signal levels, to divide voltage, to terminate transmission line. Resistors values are normally shown in colors, hand bonds. Each colors represent different value.

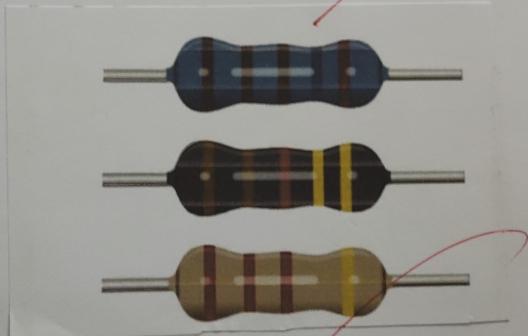


Figure 2.1: Resistors