



Experiment No.1

Electronic Devices and Components

1. Objectives

To get familiar with working knowledge of the following Instruments.

2. Theory

There are many electronic components in addition to several devices which are used to calculate the voltage, current, or to generate a sine wave, triangle wave and so on, which are listed below:

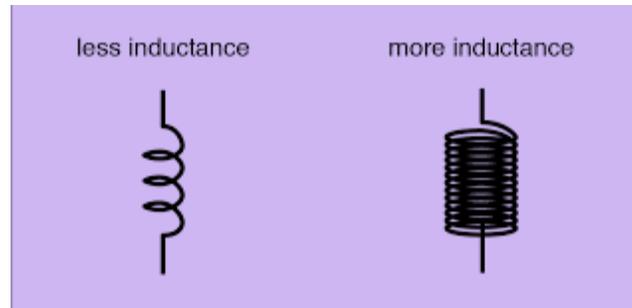
1) Resistance

Resistance is a measure of the opposition to current flow in an electrical circuit. Resistance is measured in ohms, symbolized by the Greek letter omega (Ω). Ohms are named after Georg Simon Ohm (1784-1854), a German physicist who studied the relationship between voltage, current and resistance.



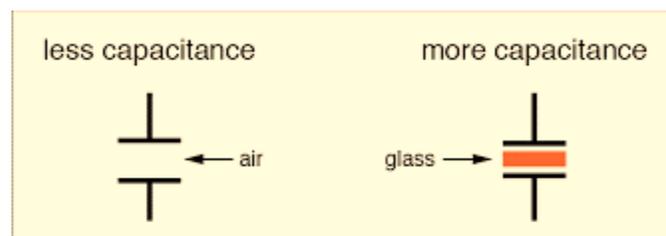
2) Inductance

In electromagnetism and electronics, inductance is the tendency of an electrical conductor to oppose a change in the electric current flowing through it. The flow of electric current creates a magnetic field around the conductor.



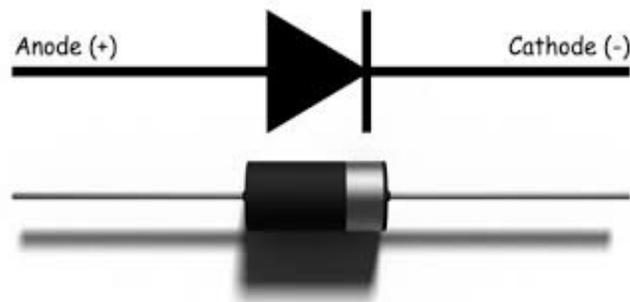
3. Capacitance

Capacitance is the ability of a body to hold an electrical charge. In numerical terms: it is the ratio of the amount of electric charge stored on a conductor to a difference in electric potential.



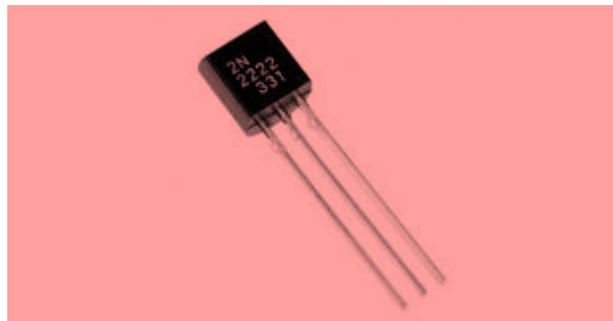
4. Diode

A diode is a semiconductor device that essentially acts as a one-way switch for current. It allows current to flow easily in one direction, but severely restricts current from flowing in the opposite direction.



5. Transistor

A transistor is a semiconductor device used to amplify or switch electronic signals and electrical power. It is composed of semiconductor material usually with at least three terminals for connection to an external circuit.





6. Ohmmeter

An ohmmeter is an electrical instrument that measures electrical resistance (the opposition offered by a substance to the flow of electric current). Micro-ohmmeters (microhmmeter or micro ohmmeter) make low resistance measurements.



7. Voltmeter

A voltmeter is an instrument used for measuring electric potential difference between two points in an electric circuit. Analog voltmeters move a pointer across a scale in proportion to
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the voltage of the circuit; digital voltmeters give a numerical display of voltage by use of an analog-to-digital converter.





9. **Multimeter**

A multimeter or a multitester, also known as a **VOM** (volt-ohm-milliammeter), is an electronic measuring instrument that combines several measurement functions in one unit. A typical multimeter can measure voltage, current, and resistance. Analog multimeters use a micro-ammeter with a moving pointer to display readings.



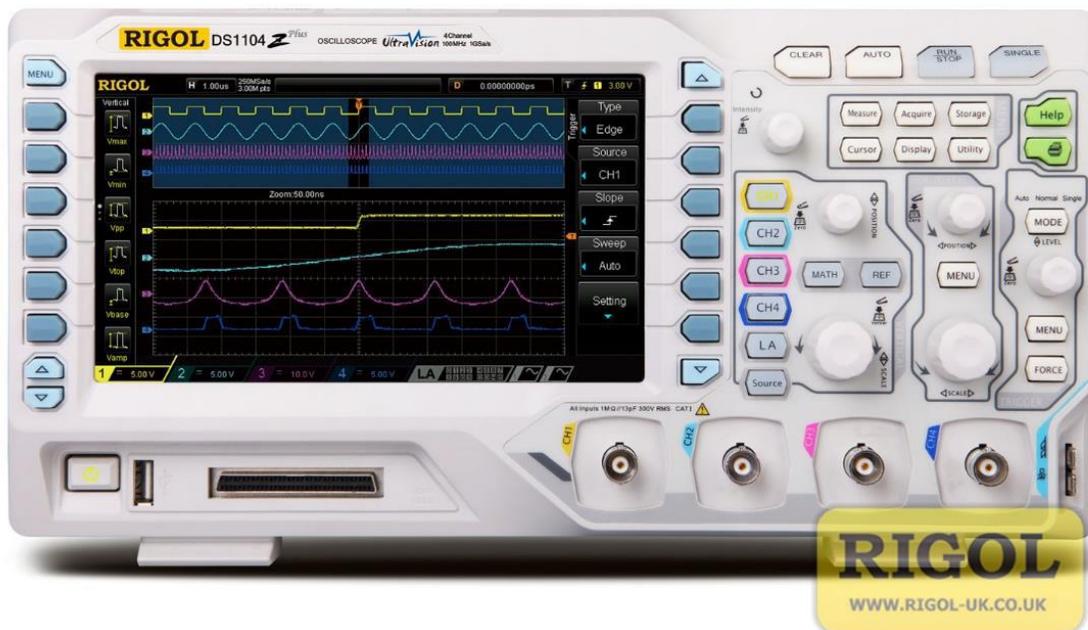
10. **Power Supply**

A power supply is an electrical device that supplies electric power to an electrical load. The primary function of a power supply is to convert electric current from a source to the correct voltage, current, and frequency to power the load.



11. Oscilloscope

An oscilloscope, previously called an oscillograph, and informally known as a scope or o-scope, **CRO** (for cathode-ray oscilloscope), or **DSO** (for the more modern digital storage oscilloscope), is a type of electronic test instrument that graphically displays varying signal voltages, usually as a calibrated two-dimensional plot of one or more signals as a function of time. The displayed waveform can then be analyzed for properties such as amplitude, frequency, rise time, time interval, distortion, and others.



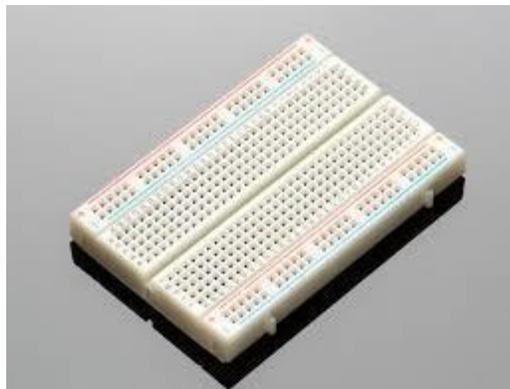
12. Function Generator

A function generator is usually a piece of electronic test equipment or software used to generate different types of electrical waveforms over a wide range of frequencies. Some of the most common waveforms produced by the function generator are the sine wave, square wave, triangular wave and saw-tooth shapes.



13. Bread Board

A breadboard is a construction base for prototyping of electronics. Originally the word referred to a literal bread board, a polished piece of wood used for slicing bread.



3. Discussion

- What is resistance, inductance, and capacitance?
- For what Ammeter, Voltmeter, Ohmmeter, and Multimeter use?
- Talk about Power Supply, Function Generator, and Oscilloscope.