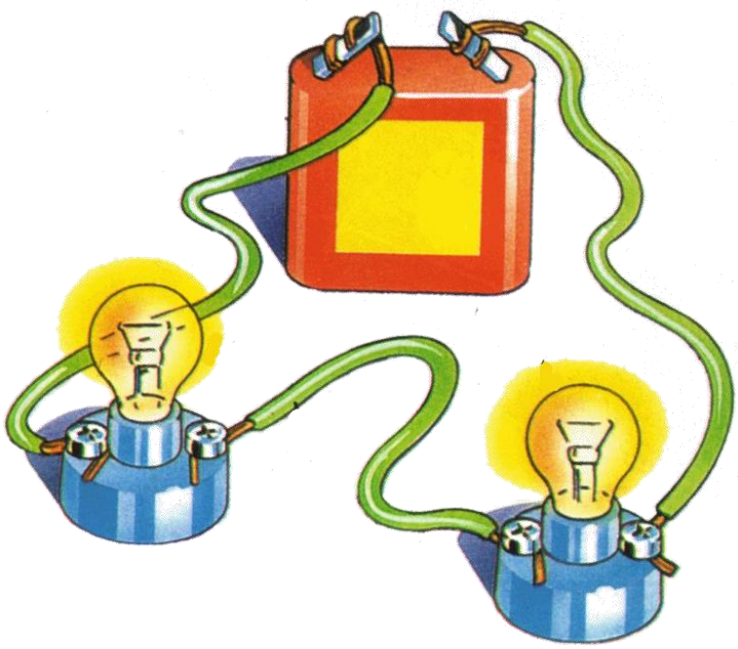
Al-Mustaqbal University
Department of Medical Instrumentation Techniques Engineering
Class: First stage
Subject: Basic Electrical Engineering Lab
Lecturer: Assistant Lecturer:Shahla Yassin ,Ali Ibrahim

Basic Electrical Engineering Lab

Exp.1



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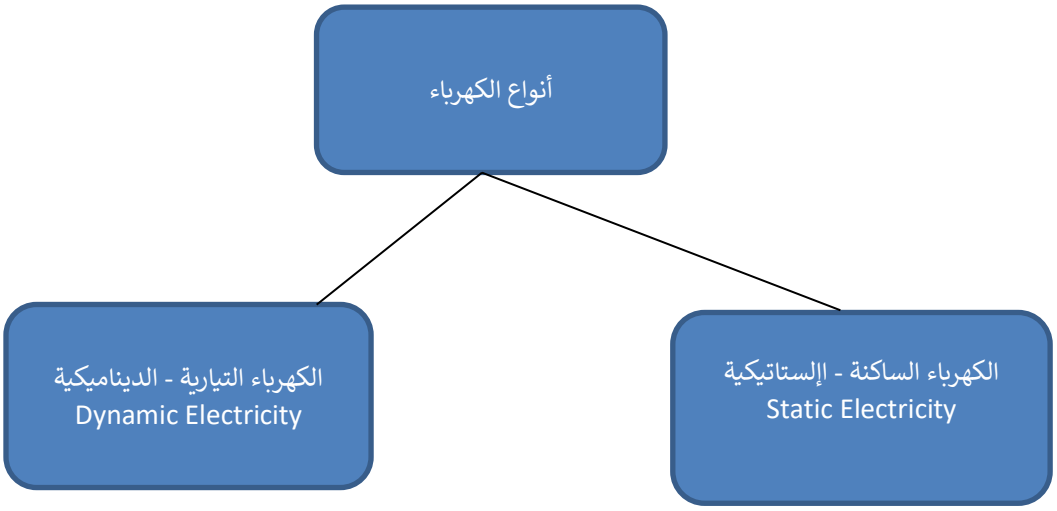
Objectives:

In this section, we provide a general introduction to the types of electricity and how they are produced, as well as the types and characteristics of electric current

Whether it is direct current (DC) or alternating current (AC), then in the third part of this section we will discuss the principles

The basic principles of electricity and a description of the basic electrical quantities and quantities.



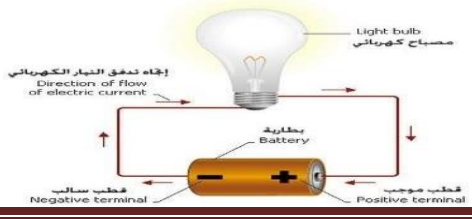
Current:

It is the flow of electrical charges that flow through a conductor when there is a potential difference or battery

Types of electric current:

1-DC current:

It is the current that flows in only one direction, either positive or negative. The following figure shows how it works DC current.



2- AC current:

Abbreviated as (AC), it is the current in which there is a continuous change in value over time, moving from positive to positive

Negative current, therefore it is also called alternating current. It is a type of dynamic electricity.

The following figure shows how alternating current works in a simple circuit.

Basic electrical quantities

Electrical quantities and quantities, whether of alternating current or direct current, are subject to electrical measurements using measuring devices

Suitable for high sensitivity and great accuracy, these electrical quantities and quantities include**:**

1- Electrical charge.

2- Potential difference.

3- Electric current.

4- The intensity of the electric current.

5- Amp.

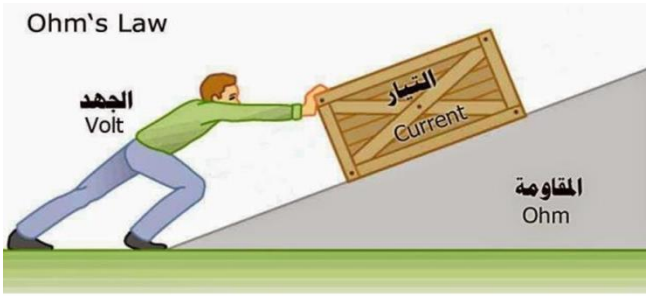
6- Coulomb.

7- Voltage

8- Electromotive force.

9- Electrical resistance.

10- Electrical conductivity of the material.



11- Electrical capacity.

12- Electrical work

Electrical Charge:

It is a property carried by subatomic particles (smaller than an atom), and it is the source of the electromagnetic force in

By nature, particles carry a negative, positive, or neutral charge, and electrons carry a negative charge.

Protons are positive charges, and neutrons are neutral charges, and the unit of charge measurement is the coulomb, which is symbolized by:

For the shipment with symbol (Q)

Difference Potential:

The potential difference between two points in an electrical circuit is called voltage or electrical pressure, and it is what causes current to pass

The electric current from one point to the other is symbolized by the symbol (V) or by the symbol (E). Voltage is also known as

It is the energy expended to move a unit of charge against the field between two points, and the unit of voltage is the volt.

It is symbolized by the symbol (V)

الكمية الكهربائية	رمز الكمية	وحدة القياس	رمز الوحدة
شدة التيار	I	أمبير	A
الجهد	V	الفولت	V
المقاومة	R	أوم	Ω
القدرة	P	واط	W
الشغل الكهربائي	W	جول	J

THE MOST IMPORTANT MEASURING DEVICES:

1-Voltmeter

This device is used to measure the voltage difference between two terminals of an electrical load or to measure a voltage source. And this is communicated

The device is in parallel with the source or electrical load, with the condition for the electric current to flow, i.e. it must be

The electrical circuit whose voltage is to be measured is closed. This device contains a selection switch to select the type of voltage

Is it an alternating voltage (AC) or a direct voltage (DC) that is being measured.

2-Ammeter

This device is used to measure the intensity of the electric current passing through an electrical load or electrical circuit and conduct this

The device with the load to be measured in series, taking into account that the circuit is closed. This device contains

Selection key to select the type of current to be measured, whether it is alternating current (AC) or direct current (DC).

3-Electrical resistance measuring device – Ohmmeter

This device is used to measure the resistance of electrical loads and to ensure the safety of these loads. This device is connected

With the loads whose resistance is to be measured in parallel, taking into account the absence of electric current flow, that is

The circuit is open.

4-Multimeter - meter AVO

This device combines the most important devices (ammeter, voltmeter, ohmmeter), and this device contains a switch

A choice through which the type of quantity to be measured and the appropriate grading (range) are selected. Recently, it has become

Multimeter digital is the most commonly used type.