

Al-Mustaqbal University
Department of Medical Instrumentation Techniques Engineering
Class: First stage
Subject: Basic Electrical Engineering Lab

Lecturer: Assistant Lecturer: **Shahla Yassin ,Ali Ibrahim**



Exp.4

Kirchhoff Voltage Law



Theory:

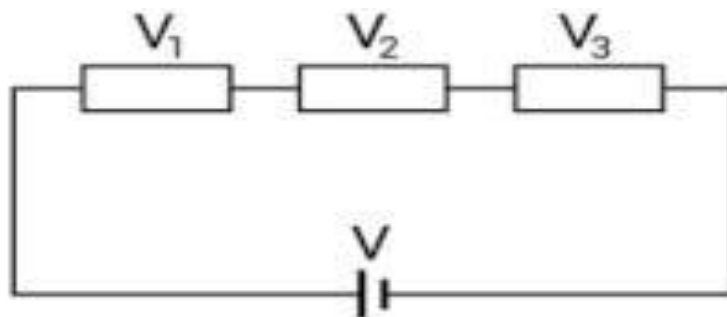
Kirchhoff's law is one of the most important laws that study and analyze electrical circuits, as the law is used to analyze simple and complex electrical circuits that contain more than one branch, so that the law summarizes that the sum of the currents entering the circuit is equal to the sum of the outgoing currents, and therefore when zeroing the equation, the sum of the currents becomes equal to zero with taking into account the path of the current, and this also applies to the voltage; The voltage of the resistors in the circuit is also zero

Kirchhoff's laws:

- Kirchhoff voltage law
- Kirchhoff current law

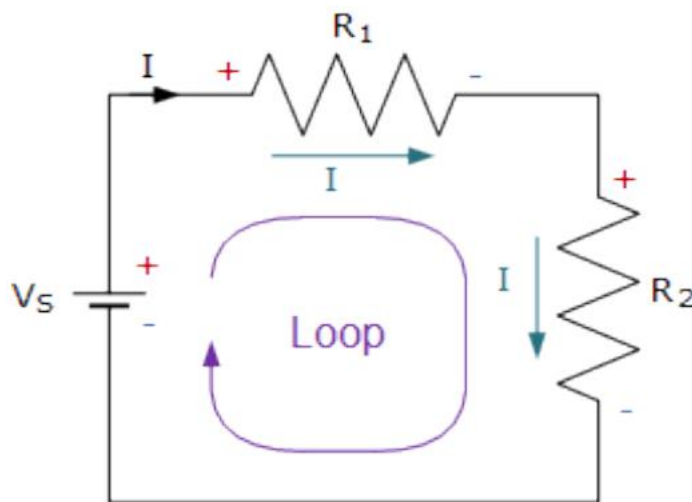
Kirchhoff voltage law

It is concerned with electric potential, and it is also known as Maxwell's third law, as it states that the sum of the algebraic efforts involved in any closed loop is equal to zero, which confirms the principle of energy conservation in electrical circuits



$$V = V_1 + V_2 + V_3$$

- 1 Implementing laboratory safety and security procedures.
2. Prepare the voltage source, test it, and determine its validity.
3. Prepare the AVO device, test it, and determine its validity.
4. Preparing materials and raw materials - resistors and board bread.
5. Set the multimeter (AVO) to voltage measurement mode.
6. Set the voltage source to 12 Volts.
7. Connect the electrical circuit as shown in the following figure using resistors (1 k Ω)



Fig(2)

Discussion:

- Any of Kirchhoff's laws is based on the principle of energy conservation, and which is based on the principle of saving the electric charge?
- What are the most prominent benefits of the Kirchhoff Law?