

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

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# Exp.5

## Kirchhoff Current Law



## Theory:

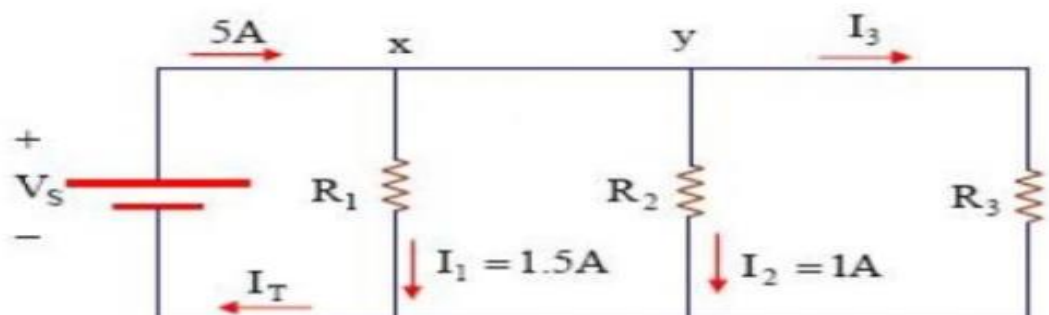
Kirchhoff's law is one of the most important laws that study and analyze electrical circuits, as the law is used to analyze simple and complex electrical circuits that contain more than one branch, so that the law summarizes that the sum of the currents entering the circuit is equal to the sum of the 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 current law

That the value of the current or electric charge that enters a specific node in the circuit is equal to the value of the current that leaves it, in other words, that means that the sum of the algebraic currents at any branching point is zero, or that the sum of the algebraic currents entering a particular node is equal to the sum of the algebraic currents emerging from it



## Linking method:

- 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 test board.
5. Set the multimeter (AVO) to the current measurement mode.
6. Set the voltage source to (Volts 2).
7. Measure the source current  $I_s$  and then record it in the designated box in the results table.
8. Measure the current passing through the resistor  $1R$  ( $I_1$ ) and then record it in the designated box in the table.

Results.

9. Measure the current passing through the resistor  $2R$  ( $I_2$ ) and then record it in the designated box in the table.

Results.

10. Calculate the total currents coming out of node (A) and then record it in the box designated for that in

Results table

## Discussion:

- Why is Kirchhoff's first law based on the principle of conservation of electric charge??
- Is Kirchhoff's law valid for all electrical circuits?