Lab 2. CURRENT AND VOLTAGE IN A CIRCUIT

1. Notice

- Students must pay attention and follow all the regulations.
- Be careful with all devices.
- Check the functionalities of all components, wires, and boards.
- **Investigate and use a multimeter together with other devices carefully. If you make any of them broken, get punished immediately.**

2. Goals

- Verify Ohm's law and Kirchhoff's law of current and voltage in a circuit.
- Investigate the relationship between current and voltage in a circuit.

3. Excercises

Excerise 1. Investigate the current and voltage properties of a circuit in Figure 1 by utilizing Ohm's law, with R_1 = 10 kΩ, R_2 = 1 kΩ, R_3 = 10 kΩ, R_4 = 1 kΩ, R_5 = 330 Ω, Vs = 5V.

Requirements:

a) Compute the current and voltage for each resistor theoretically.
b) Implement the equivalent circuit in a board. Verify the implemented circuit carefully before setting the power supply Vs = 5V.
c) Using a multimeter to measure the current and voltage dropped across each resistor. Measure twice and record the corresponding values. Compare the numerical and theoretical results, then draw some main observations and conclusions.

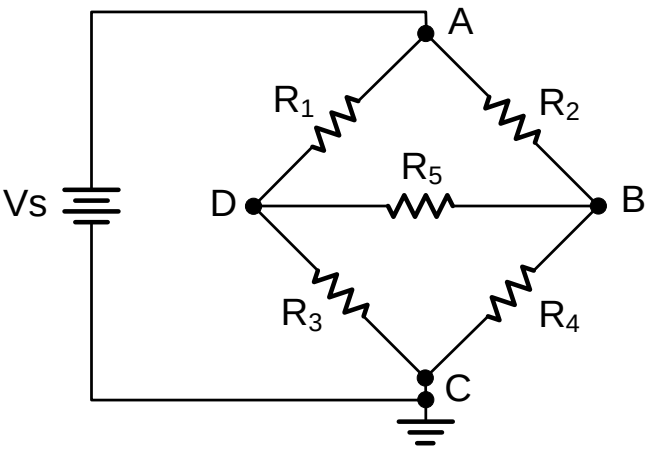

Figure 1. The considered circuit to investigate Ohm's law

Excercise 2. Investigate the current and voltage properties of the circuit in Figure 2 by utilizing the Kirchhoff's laws, with R_1 = 1 kΩ, R_2 = 330 Ω, R_3 = 1 kΩ, R_4 = 330 Ω, R_5 = 10 kΩ, R_6 = 1 kΩ, R_7 = 330 Ω, R_8 = 330 Ω, Vs = 5V.

Requirements:

a) Implement the equivalent circuit on a board. Verify the implemented circuit carefully before setting the power supply Vs = 5V.
b) Investigate Kirchhoff's law on the current at the nodes A, B, C, D, E. Use a multimeter to measure the current at all the nodes. Record the results in a table.
c) Investigate Kirchhoff's law on the voltage for the circuits V_1, V_2, V_3, V_4. Use a multimeter to measure the voltage dropped across each resistor and record the results in a table.

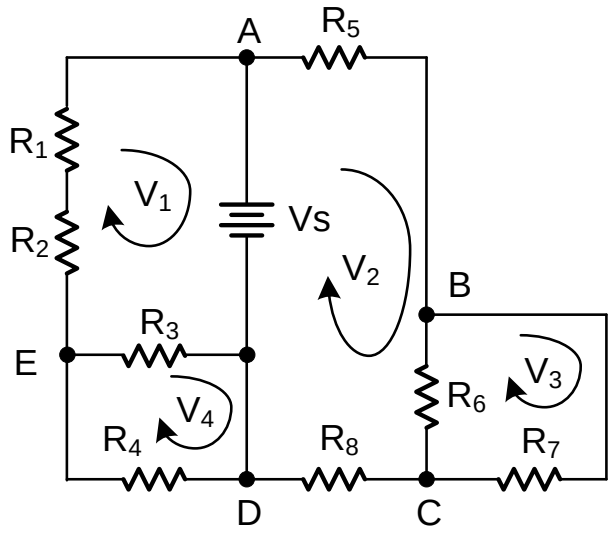

Figure 2. The considered circuit to investigate Kirchhoff's laws

Components and devices needed for the lab:

Component	**Description**	**Amount**
Resistor	330 Ω/1 kΩ/10 kΩ	5/5/3
DC Voltage	5-12V	1
Circuit board		1
Wires		Few
Multimeter		1