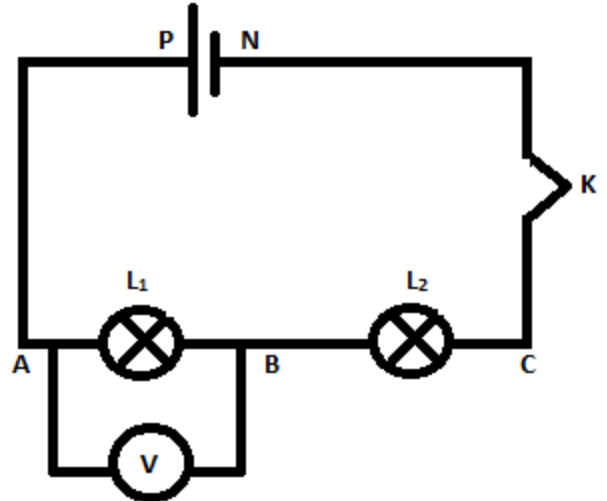


First Question: (8 pts)

DC Voltage

The given diagram represents an electric circuit consists of a dry cell that provide a constant voltage 12 V, 2 lamps, a switch K, connecting wires and a voltmeter that indicates +9V. The current sent by the dry cell is 500 mA.

1. Determine the voltage U_{CN} across the closed switch K.
2. Indicate the voltages U_{PA} .
3. Specify whether the voltmeter measures the value of U_{AB} or U_{BA} .
4. Deduce the voltage U_1 across the lamp L_1 .
5. Calculate the voltage U_{BC} across the lamp L_2 .
6. Determine the currents carried by the lamps L_1 and L_2 .
7. Indicate on the diagram an ammeter that gives negative indication of the current sent by the dry cell.



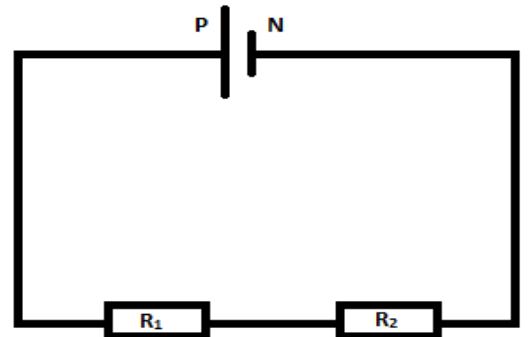
Second Question: (5 pts)

Grouping Resistor in Series

Consider the circuit given by the adjacent figure.

Given: The dry cell maintains a constant voltage $U_{PN} = 12\text{ V}$; $R_1 = 100\ \Omega$ and $R_2 = 200\ \Omega$.

- 1) Find the resistance of the resistor equivalent to the two resistors.
- 2) Calculate the current sent by the dry cell.
- 3) Calculate the voltage U_1 across the resistor R_1 .
- 4) Calculate the voltage U_2 across the resistor R_2 .



Third Question: (6 pts)

Grouping Resistor in Parallel

Consider the circuit given by the adjacent figure.

Given: The current sent by the dry cell $I = 1\text{ A}$; $R_1 = 40\ \Omega$ and $R_2 = 10\ \Omega$.

- 1) Indicate the direction of the current in each branch.
- 2) Find the resistance of the resistor equivalent to the two resistors.
- 3) Calculate the voltage U_{PN} across the generator.
- 4) Calculate the current I_1 across the resistor R_1 .
- 5) Calculate the current I_2 across the resistor R_2 .

