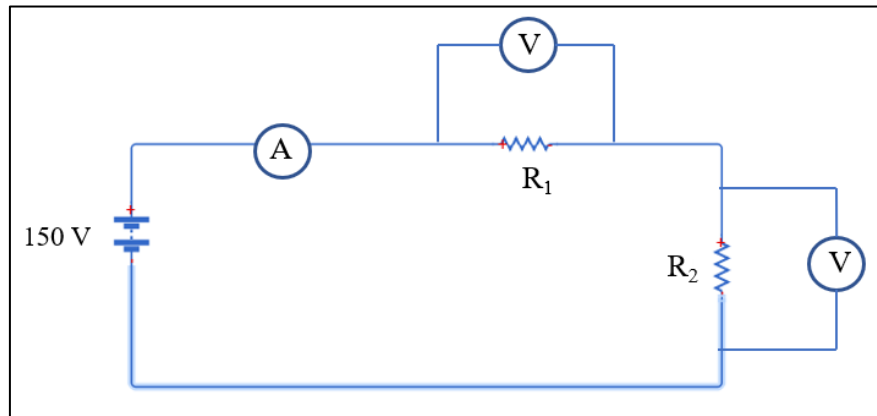


EXPERIMENT 1

Aim: To study Ammeter and Voltmeter for current and voltage measurement in circuit.

Apparatus: DC Power Supply, Ammeter (0-1A), Voltmeter (0-150V), Rheostats, Multimeter

Circuit Diagram:



Brief Theory:

The current flowing through the circuit and voltage dropped across any resistor can be measured by using Ammeter and Voltmeter respectively. The ammeter is connected in series with the resistor whereas voltmeter is connected in parallel with the resistor.

To calculate current and voltage mathematically, we need to understand Ohm's Law. Ohm's law deals with the relationship between current, voltage and ideal resistance. It states that, "the current (I) through a conductor between two points is directly proportional to the voltage (V) across the two points."

$$\text{i.e. } I \propto V$$

Introducing the constant of proportionality i.e. resistance (R) we arrive at basic form of Ohm's law.

$$I = \frac{V}{R} \quad \text{or} \quad V = IR$$

For series resistive circuit, if one knows the voltage supplied to the circuit and total resistance of circuit then using Ohm's law, one can calculate the current flowing through the circuit. Similarly, if one knows the current value passing through the resistor then using Ohm's law one can calculate the voltage dropped across that resistor.

To calculate the total resistance for series resistive circuit one can, use below formula:

$$R_T = R_1 + R_2 + \dots + R_n$$

Procedure:

- 1) Connect the circuit as shown in the diagram.
- 2) Set the values of rheostats to $R_1=145\Omega$ and $R_2=50\Omega$.
- 3) Turn ON the DC Power Supply and measure the supply given to circuit using Multimeter.
- 4) Measure the current in circuit by connecting Ammeter in series with the resistor.
- 5) Measure the voltage in circuit by connecting Voltmeter across the resistor.

Observation Table:

$R_1=145\Omega$, $R_2=50\Omega$, $V = 150\text{volts}$

	Observed Values	Calculated Values
Current through circuit, I	<u>0.84 Amperes</u>	
Voltage across R_1, V_1	<u>125 Volts</u>	
Voltage across R_2, V_2	<u>40 Volts</u>	

Calculations:

Question:

- 1) For series resistive circuit with 150volts DC supply, $R_1 = 130\Omega$ and $R_2 = 60\Omega$. Calculate the current flowing through the circuit and voltage dropped across both the resistors.

Results:

- 1) Current through circuit, $I = \underline{\hspace{2cm}}$ Amperes
- 2) Voltage across R_1 , $V_1 = \underline{\hspace{2cm}}$ Volts
- 3) Voltage across R_2 , $V_2 = \underline{\hspace{2cm}}$ Volts

Conclusion: