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ROLL NO: F-24

EXPERIMENT: No. 01

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- **Aim**: To study ammeter and voltmeter for current and voltage measurement in circuit.

- **Apparatus**:
1. DC Power Supply
2. Ammeter (0-1A)
3. Voltmeter (0-150V)
4. Rheostats
5. Multimeter

- **Theory**:

- Ohm's Law - the current (I) through a conductor between two points is directly proportional to the voltage (V) across the two points.

$$V = IR$$

- **Procedure**:

1. Connect the circuit as shown in the figure.
2. Set the values of rheostat 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.

- **Calculations**:

$$R_{net} = R_1 + R_2 = 195\,\Omega$$

$$\therefore I = \frac{V}{R_{net}} = \frac{150}{195} = 0.77\,A$$

Sundaram

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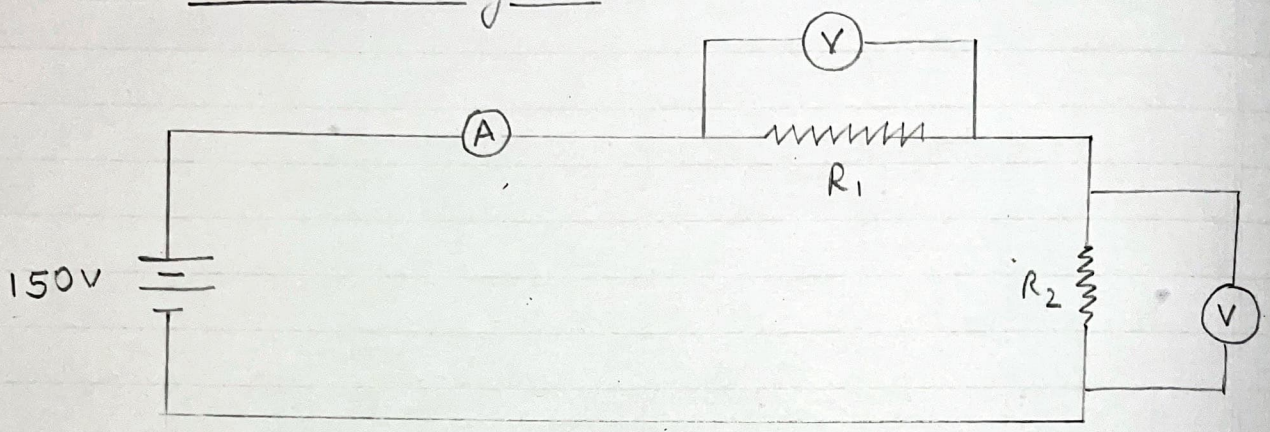
Circuit Diagram



$R_1 = 145\,\Omega$, $R_2 = 50\,\Omega$, $V = 150$ V

Observation Table

	Observed Values	Calculate Values
Current through circuit, I	0.84 A	0.77 A
Voltage across R_1, V_1	125 V	111.54 V
Voltage across R_2, V_2	40 V	38.46 V

∴ Voltage across resistor R_1, $V_1 = IR_1$

$V_1 = 111.54\ V$

and, Voltage across resistor R_2, $V_2 = 38.46\ V$

- **Question:** For series resistive circuit with 150V DC supply $R_1 = 130\ \Omega$ & $R_2 = 60\ \Omega$. Calculate the current flowing through the circuit and voltage dropped ~~using~~ across both the resistors.

Answer: $R_{net} = 130 + 60 = 190\ \Omega$

$\therefore I = \frac{V}{R_{net}} = \frac{150}{190} = 0.79\ V$

∴ Voltage across resistor R_1, $V_1 = IR_1 = 102.63\ V$

and, voltage across resistor R_2, $V_2 = IR_2 = 47.37\ V$

- **Results:**

1. Current through circuit, $I = 0.77\ A$
2. Voltage across R_1, $V_1 = 111.54\ A$
3. Voltage across R_2, $V_2 = 38.46\ A$

- **Conclusion:**

- The observed and calculated values differ by small values.
- Ammeter & Voltmeter practically affect the current and voltage across the circuit elements.