Experiment 2: Series - Parallel DC circuit and verification of kinchhoff's Laws.

Circuit Diagram:

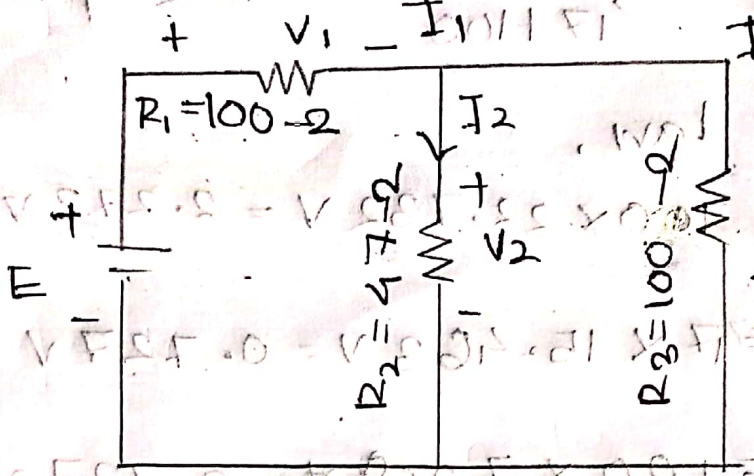


figure: Circuit for experiment

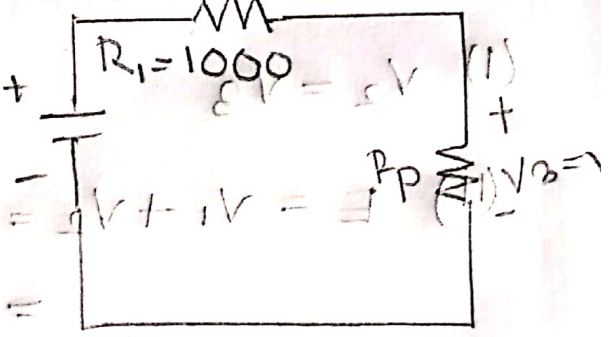
Pre-lab report questions:

(1) Simplify the circuit,

$R_p = R_2 \parallel R_3$

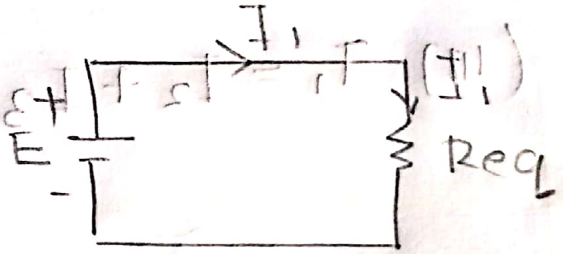
$= 47 \parallel 100$

$= 31.973\ \Omega$



$R_{eq} = R_p + R_1 = (100 + 31.973)\ \Omega$

$= 131.973\ \Omega$



$$I_1 = \frac{E}{R_1 + R_p} = 0.022732\ A = 22.732\ mA$$

Using CDR,

$$I_2 = \frac{R_3 \times I_1}{R_2 + R_3} = \frac{100 \times 22.732}{47 + 100} = 15.463 \text{ mA}$$

$$I_3 = \frac{R_2 \times I_1}{R_2 + R_3} = \frac{47 \times 22.732}{47 + 100} = 7.269 \text{ mA}$$

Using ohm's law,

$$V_1 = I_1 \times R_1 = 100 \times 22.732 \text{ V} = 2.273 \text{ V}$$

$$V_2 = I_2 \times R_2 = 47 \times 15.463 \text{ V} = 0.727 \text{ V}$$

$$V_3 = I_3 \times R_3 = 100 \times 7.269 \text{ V} = 0.727 \text{ V}$$

(Ans!)

Ans to the Ques: 2

From the calculated values,

(i) $V_2 = V_3$

(ii) $E = V_1 + V_2 = (0.727 + 2.273) \text{V}$

$= 3$

(iii) $I_1 = I_2 + I_3 = (15.463 + 7.269) \text{ mA}$

$= 22.732 \text{ mA}$

(Ans!)