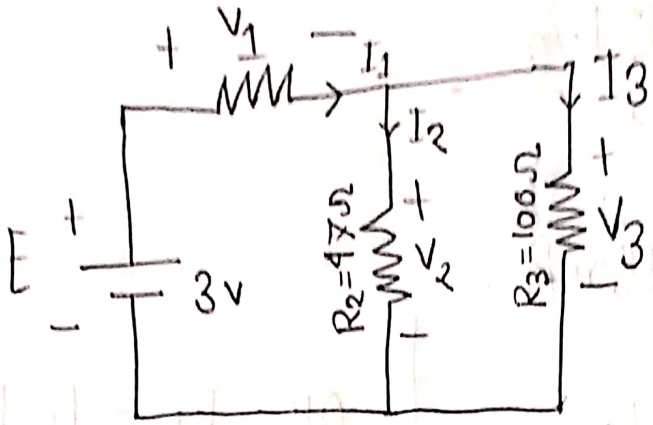
Lab-2 (Pre-Lab Report)

Question 1:



Theoretically calculate the values of V_1; V_2, V_3, I_1, I_2 and I_3 of the circuit $E = 3V$

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we know,

Ohm's Law $V = IR$

$E = I_1 R_{eq}$

$R_p = 47 \parallel 100 = 31.973\,\Omega$

$$I_1 = \frac{E}{R_1 + R_p} A = \frac{3}{100 + 31.973} A = 22.73\,mA$$

Using CDR

$$I_2 = \frac{R_3 \times I_1}{R_2 + R_3}$$

$$= \frac{100 \times 22.73}{47 + 100}$$

$$I_2 = 15.46\,mA$$

$$I_3 = \frac{R_2 \times I_1}{R_2 + R_3}$$

$$= \frac{47 \times 22.73}{47 + 100}$$

$$= 7.268\,mA$$

or, $I_1 = I_2 + I_3$

$\Rightarrow I_1 - I_2 = I_3$

$\Rightarrow I_3 = 22.73 - 15.46$

$\therefore I_3 = 7.268\,mA$

$V_1 = I_1 R_1 = 100 \times 22.73 \times 10^{-3} = 2.273\,V$

$V_2 = I_2 R_2 = 47 \times 15.46 \times 10^{-3} = 0.727\,V$

$V_3 = I_3 R_3 = 100 \times 7.268 \times 10^{-3} = 0.727\,V$

(2)

From the calculated values show that

(i) $V_2 = V_3$

(ii) KVL holds, that is, $E = V_1 + V_2$ and

(iii) KCL holds, that is, $I_1 = I_2 + I_3$

(i) Into this circuit R_2 and R_3 Resistors connected in Parallel.

we already know that Parallel Circuit voltage same. So, $V_2 = V_3$

Same value.

(ii) Applying KVL (Kirchhoff's voltage law)

$$E = 2.273 + 0.727$$

$$\Rightarrow 3v = 3.0\,v$$

$$3 = 3$$

(iii) Applying KCL (kirchhoff's current Law)

$$I_1 = I_2 + I_3$$

$$\Rightarrow 22.73_{mA} = (15.46 + 7.268)\,mA$$

$$\Rightarrow 22.73 = 22.73$$