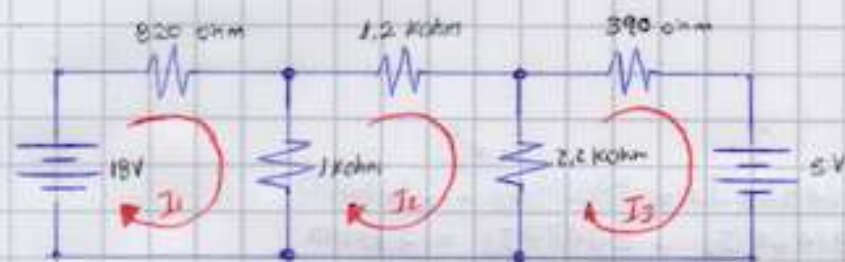


2.5) Procedimiento

2.5.1) Implemente el circuito que se presenta en la figura



2.5.2) Mida cada uno de los conductos de Kays y anote los resultados en la tabla 2.1

Utilizamos Ley de Ohm $\Rightarrow V = IR$ y la LK.

Malla ①



$$\sum V = 0$$

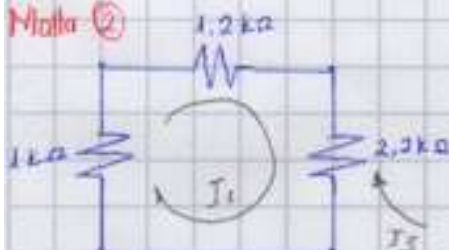
$$18 = V_1 + V_2$$

$$18 = 0,82 I_1 + 1(I_1 + I_2)$$

$$18 = 0,82 I_1 + I_1 - I_2$$

$$18 = 1,82 I_1 - I_2 \quad (1)$$

Malla ②



$$\sum V = 0$$

$$V_2 + V_3 + V_4 = 0$$

$$1(I_2 - I_1) + 1,2(I_2) + 2,2(I_2 - I_3) = 0$$

$$I_2 - I_1 + 1,2 I_2 + 2,2 I_1 - 2,2 I_3 = 0$$

$$-I_1 + 4,4 I_2 - 2,2 I_3 = 0 \quad (2)$$

Malla ③



$$\sum V = 0$$

$$V_4 + V_5 = 0$$

$$2,2(I_3 - I_2) + (0,39) I_3 = -5$$

$$2,2 I_3 - 2,2 I_2 + 0,39 I_3 = -5$$

$$2,2 I_2 - 2,59 I_3 = 5 \quad (3)$$

Resolvi 3 ecuaciones con 3 incógnitas.

$$\begin{cases} 1) \frac{91}{50} I_1 - I_2 = 18 \\ 2) -I_1 + \frac{22}{5} I_2 - \frac{11}{5} I_3 = 0 \\ 3) \frac{11}{5} I_2 - \frac{259}{100} I_3 = 5 \end{cases} \Rightarrow \begin{cases} 1) \left\{ I_1 = \frac{900}{91} + \frac{50}{91} I_2 \right. \\ 2) \left\{ -1752 I_2 - 1001 I_3 = 4500 \quad (\times 39) \right. \\ 3) \left\{ 220 I_2 - 259 I_3 = 500 \quad (\times 143) \right. \end{cases}$$

$$2) -\left(\frac{900}{91} + \frac{50}{91} I_2\right) + \frac{22}{5} I_2 - \frac{11}{5} I_3 = 0 \Rightarrow -\frac{900}{91} - \frac{50}{91} I_2 + \frac{22}{5} I_2 - \frac{11}{5} I_3 = 0$$

$$-\frac{900}{91} + \frac{1752}{455} I_2 - \frac{11}{5} I_3 = 0 \quad (\times 455) \Rightarrow -4500 + 1752 I_2 - 1001 I_3 = 0$$

$$3) \frac{11}{5} I_2 - \frac{259}{100} I_3 = 5 \quad (100) \Rightarrow 100 \left(\frac{11}{5} I_2 - \frac{259}{100} I_3 \right) = 5(100)$$

$$\Rightarrow 220 I_2 - 259 I_3 = 500$$

② y ③

$$\begin{cases} 1752 I_2 - 1091 I_3 = 4500 & (32) \\ 220 I_2 - 259 I_3 = 500 & (100) \end{cases} \Rightarrow \begin{cases} -69824 I_2 + 39037 I_3 = -166500 \\ 31460 I_2 - 37037 I_3 = 71500 \end{cases}$$

$$-38364 I_2 = -95000 \quad (2) \Rightarrow I_2 = \frac{1250}{489}$$

I_2 en ③

$$220 \left(\frac{1250}{489} \right) - 259 I_3 = 500 \Rightarrow I_3 = \frac{1500}{3073}$$

$$I_1 = \frac{900}{91} + \frac{1250}{489} \left(\frac{50}{91} \right) ; I_1 = \frac{25200}{3073}$$

$$I_1 = 11,45 \text{ mA}; I_2 = 2,847 \text{ mA}; I_3 = 0,488 \text{ mA} //$$

Calculo del Error porcentual

$$\text{Fórmula: } e\% = \left(\frac{|\text{valor teórico} - \text{valor calculado}|}{\text{valor teórico}} \right) \times 100$$

$$E I_1 \% = \left(\frac{|11,45 \text{ mA} - 11,50 \text{ mA}|}{11,45 \text{ mA}} \right) \times 100 = 0,4 \%$$

$$E I_2 \% = \left(\frac{|2,847 \text{ mA} - 2,85 \text{ mA}|}{2,847 \text{ mA}} \right) \times 100 = 0,1 \%$$

$$E I_3 \% = \left(\frac{|0,4881 \text{ mA} - 0,49 \text{ mA}|}{0,4881 \text{ mA}} \right) \times 100 = 0,3 \%$$