EAST WEST UNIVERSITY

Course Title: CSE209

Section: 02

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Assignment- 03

SUBMITTED TO

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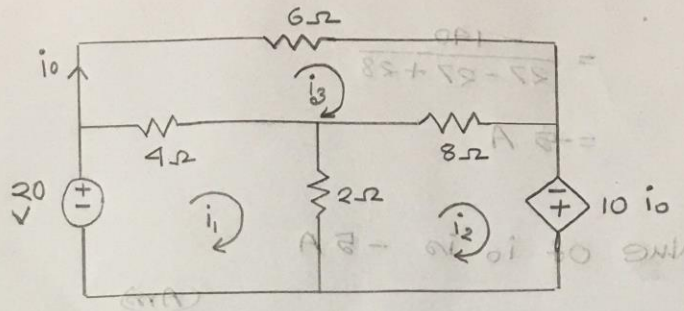

Applying KVL in mesh - 1;

$$-20 + 4(i_1 - i_3) + 2(i_1 - i_2) = 0$$

$$\Rightarrow 6i_1 - 2i_2 - 4i_3 = 20$$

$$\Rightarrow 3i_1 - i_2 - 2i_3 = 10 \quad \text{----- (i)}$$

Applying KVL in mesh - 2;

$$2(i_2 - i_1) + 8(i_2 - i_3) + 10 i_0 = 0$$

$$\Rightarrow 10 i_2 - 2i_1 - 8i_3 - 10 i_3 = 0$$

$$\Rightarrow -2i_1 + 10 i_2 - 18 i_3 = 0$$

$$\Rightarrow -i_1 + 5 i_2 - 9 i_3 = 0 \quad \text{------ (ii)}$$

Applying KVL in mesh 3;

$$6i_3 + 8(i_3 - i_2) + 4(i_3 - i_1) = 0$$

$$\Rightarrow 18 i_3 - 8 i_2 - 4 i_1 = 0$$

$$\Rightarrow -2i_1 - 4 i_2 + 9 i_3 = 0 \quad \text{.... (iii)}$$

Applying Cramer's rule we get,

$$i_3 = \frac{\begin{vmatrix} 3 & -1 & 10 \\ -1 & 5 & 0 \\ -2 & -4 & 0 \end{vmatrix}}{\begin{vmatrix} 3 & -1 & -2 \\ -1 & 5 & -9 \\ -2 & -4 & 9 \end{vmatrix}}$$

$$= \frac{-10(4+10)}{3(45-36)+1(-9-18)+2(4+10)}$$

$$= \frac{-140}{27 - 27 + 28}$$

$$= -5 \text{ A}$$

$\therefore$ The value of i_o is -5 A

(Ans)