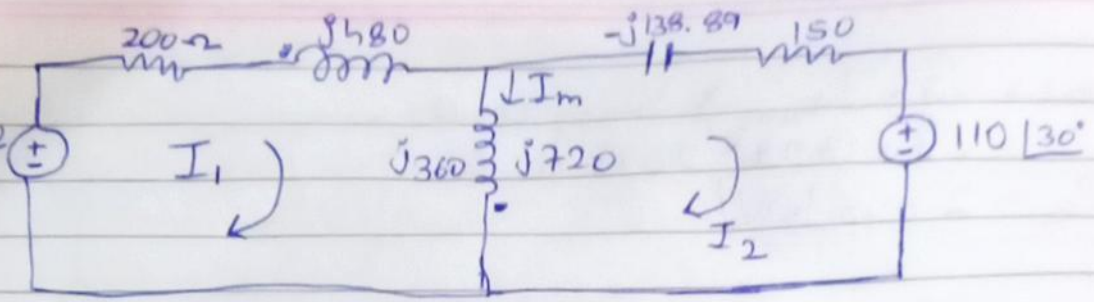
Q23)



KVL

Loop I: $800 = (200 + j480 + j720)I_1 + j360I_2 - j720I_2$

$\Rightarrow 800 = (200 + j1200)I_1 - j860I_2 \quad -①$

KVL Loop II: $-95.2628 - j55 = -j360I_1 + (150 + j581.1)I_2 \quad -②$

$$\Rightarrow \begin{bmatrix} 800 \\ -95.2628 - j55 \end{bmatrix} = \begin{bmatrix} 200+j1200 & -j360 \\ -j360 & 150+j581.1 \end{bmatrix} \begin{bmatrix} I_1 \\ I_2 \end{bmatrix}$$

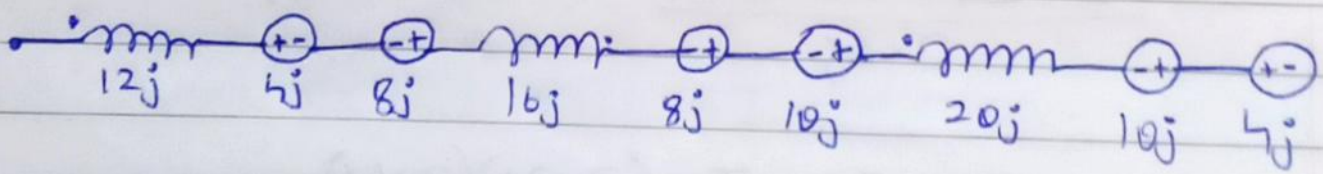
$\Rightarrow I_1 = 0.1390 - j0.7252$

$I_2 = 0.0609 - j0.2690$

$I_x = I_1 - I_2$

$\Rightarrow \boxed{I_x = 461.9 \cos(600t - 80.26)\,mA}$

2)



$L_T = 12 + 4 - 8 + 16 - 8 - 10 + 20 - 10 + 4$

$\Rightarrow \boxed{L_T = 20\,H}$