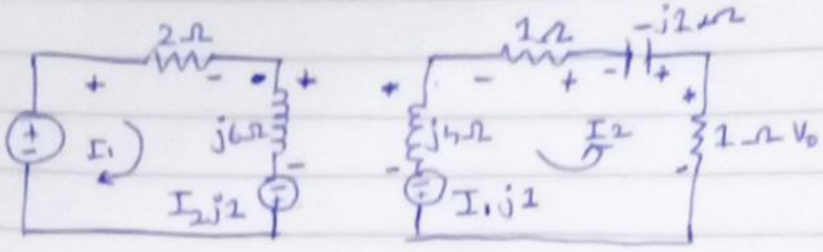
Q22



KVL in ①: $24\angle 0 + I_2(j2) = I_1(2+6j)$

$$\Rightarrow I_1 = \frac{24\angle 0 + I_2(j2)}{2+6j} \quad -①$$

KVL in ②: $I_1(1j) - I_2(1) = I_2(1-1j+4j)$

$$\Rightarrow I_1(1j) = I_2(2+3j) \quad -②$$

From ① and ②

$$\frac{[24\angle 0 + I_2(1j)]j}{2+6j} = I_2(2+3j)$$

$$\Rightarrow \frac{[24\angle 90 + I_2(1j)]j}{2+6j} = I_2(2+3j)$$

$$24\angle 90 - I_2 = I_2(2+3j)(2+6j)$$

$$24\angle 90 = I_2(-13+8j)$$

$$\Rightarrow I_2 = \frac{24\angle 90}{-13+8j} = 1.08\angle -35.84\ A$$

$$\therefore V_o = -I_2(1) = -1.08\angle -35.84$$

$$\Rightarrow \boxed{V_o = 1.08\angle 144.16\ V}$$