Question 1 :-

(a) phasor representation of the voltage source is $20\angle 45^\circ$.

(b) impedance of $L2 = j\omega L$

$= j \times 50 \times 500 \times 10^{-3}$

$= j25$

(c) equivalent impedance of C1 and C2 :-

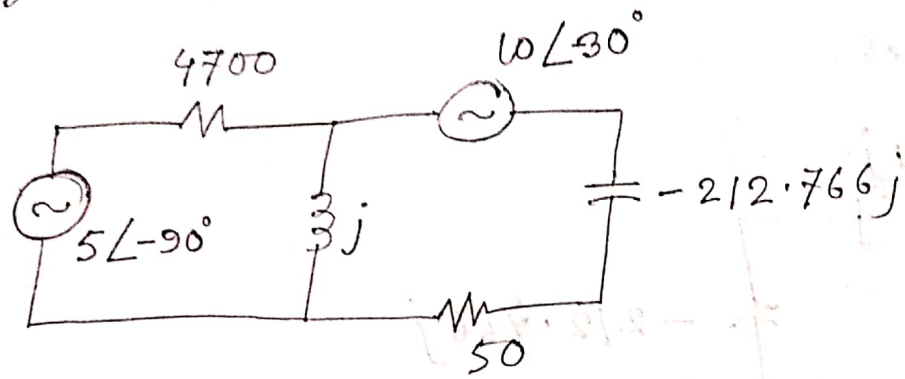
$$\frac{1}{Z} = \frac{1}{Z_1} + \frac{1}{Z_2} = \frac{1}{1/j\omega C_1} + \frac{1}{1/j\omega C_2}$$

$$\therefore Z = (j\omega C_1 + j\omega C_2)^{-1}$$

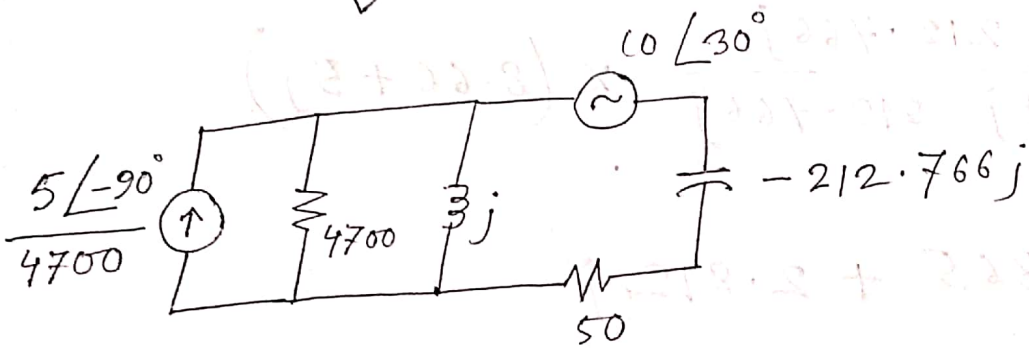
$$= \{j \times 50 \times (47 \times 10^{-3} + 470 \times 10^{-6})\}^{-1}$$

$$= -j\,0.421 .$$

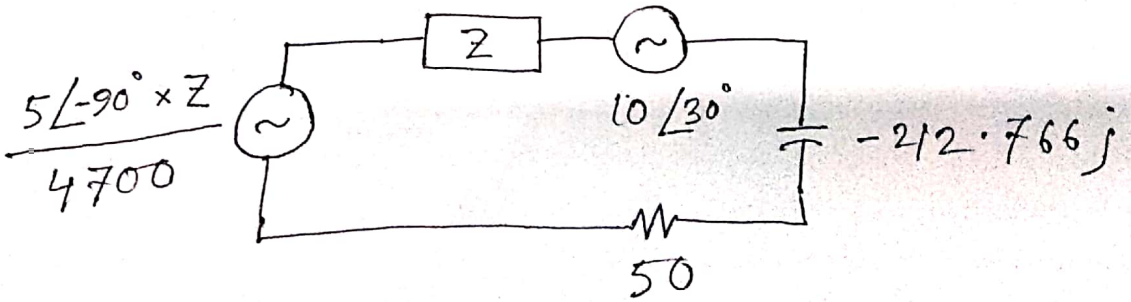
Question 2:-



⇓ source transformation of $5\angle -90^\circ$

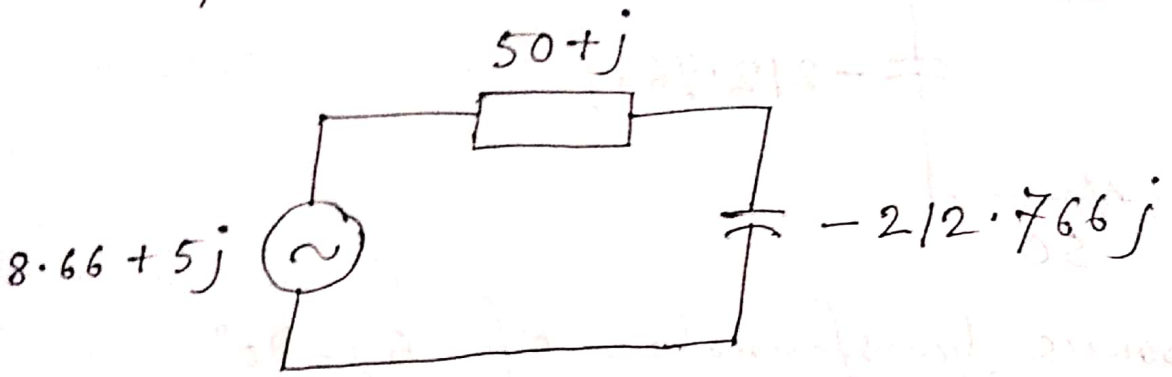


⇓ equivalent impedance of 4700 & j and again source transformation of $\frac{5\angle -90^\circ}{4700}$.



Here, $\frac{1}{Z} = \frac{1}{4700} + \frac{1}{j} \Rightarrow Z = \frac{4700j}{4700+j}$.

finally the circuit can be represented as,



$$\therefore V_c = \frac{-212.766j}{50+j-212.766j} \times (8.66+5j)$$

$$= 9.365 + 2.812j$$

$$= 9.778 \angle 16.716^\circ$$

$$= 9.778 \cos(10t + 16.716) \text{ V}$$

(Ans)