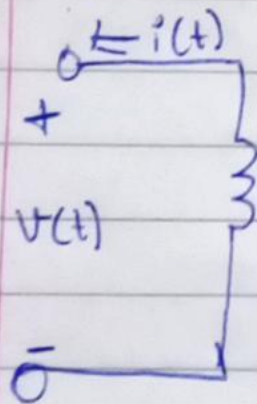


Q10

(i)



$$i(t) = I_m \cos(2\pi(50)t + \phi)$$

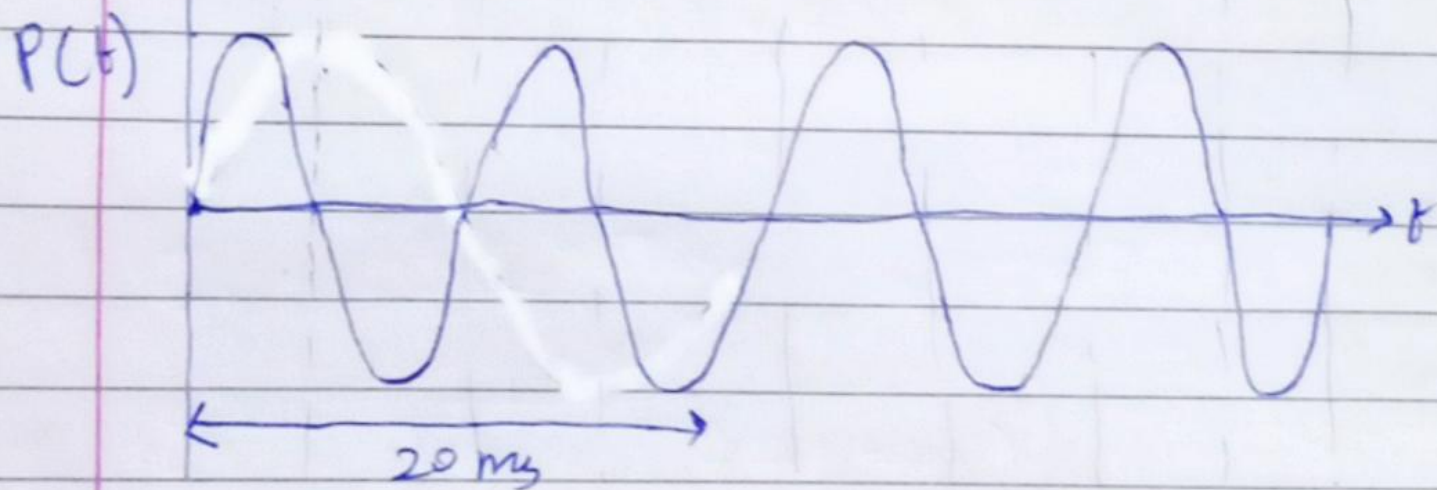
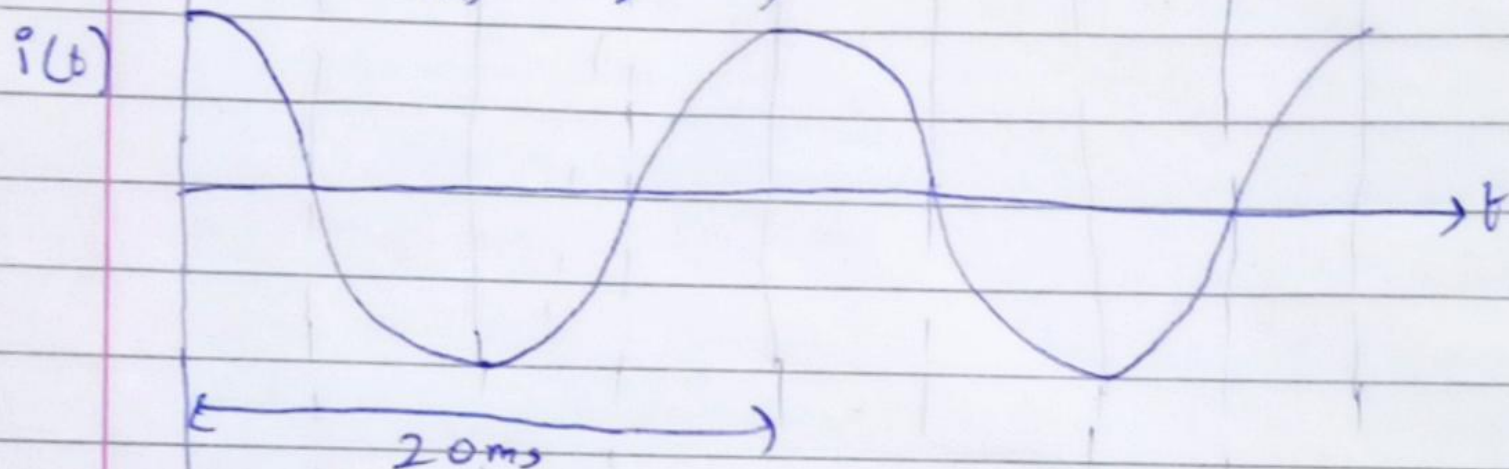
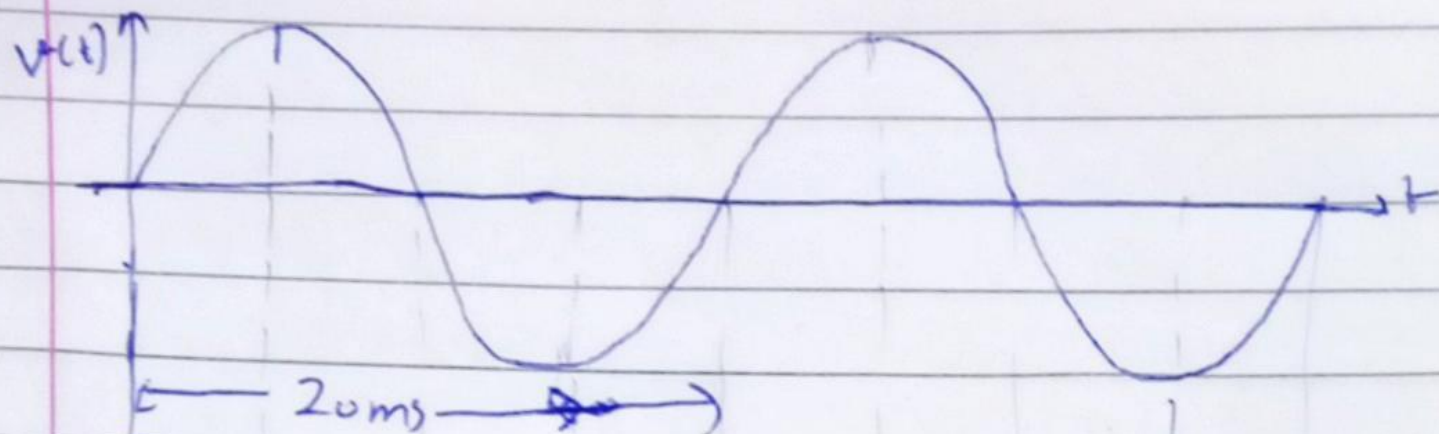
$$v(t) = -L \frac{di}{dt}$$

$$= + I_m \sin(100\pi t + \phi) \times 100\pi$$

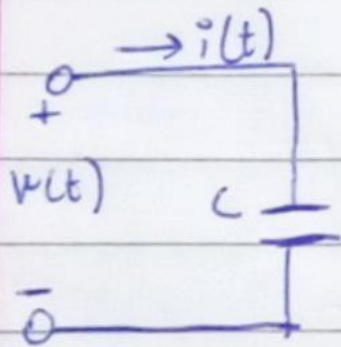
$$\Rightarrow v(t) = 100\pi I_m \sin(100\pi t + \phi)$$

$$p(t) = 100\pi I_m^2 \sin(100\pi t + \phi) \cos(100\pi t + \phi)$$

$$\Rightarrow p(t) = 50\pi I_m^2 \sin(2(100\pi t + \phi))$$



(ii)



$$i(t) = I_m \cos(100\pi t + \phi)$$

$$v(t) = \frac{1}{C} \int I_m \cos(100\pi t + \phi)$$

$$v(t) = \frac{I_m}{100\pi C} \sin(100\pi t + \phi)$$

$$p(t) = \frac{I_m^2}{100\pi C} \sin(100\pi t + \phi) \cos(100\pi t + \phi)$$

$$p(t) = \frac{I_m^2}{200\pi C} \sin(2(100\pi t + \phi))$$

