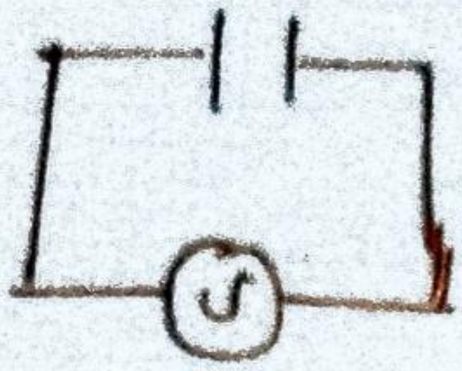
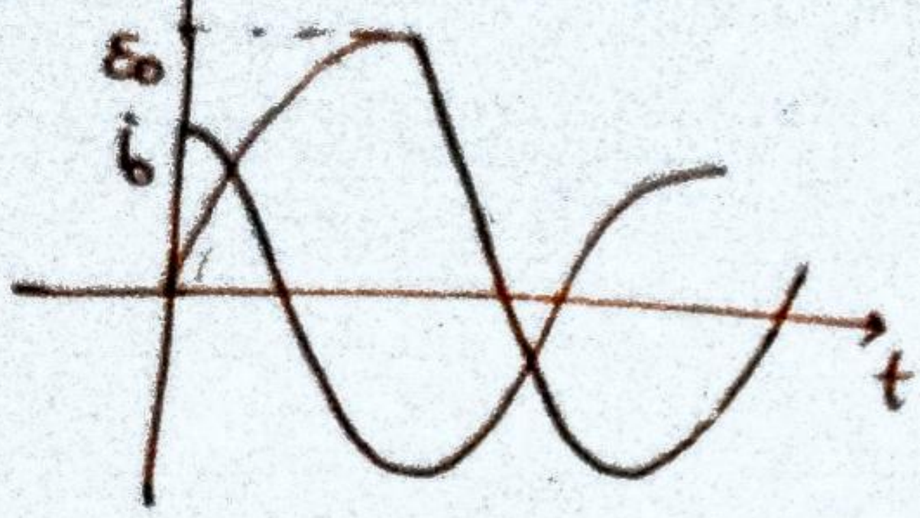
* AC. Circuit with Capacitor



$$\varepsilon = \varepsilon_0 \sin(\omega t)$$

$$i = \frac{\varepsilon_0}{\omega L} \sin\left(\omega t - \pi/2\right)$$

[Current Leads by $\pi/2$] *



NOTE :-

X_L → Inductive reactance

$$X_L = \omega L$$

X_C → Capacitive reactance

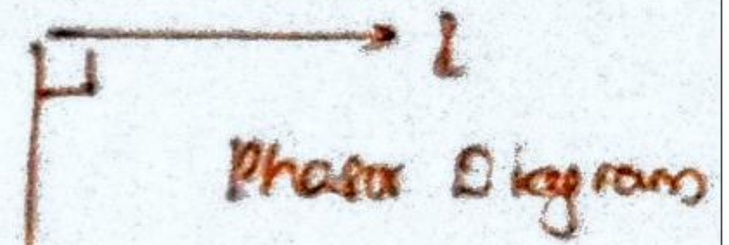
$$X_C = \frac{1}{\omega C}$$

$$\varepsilon = \varepsilon_0 \sin(\omega t)$$

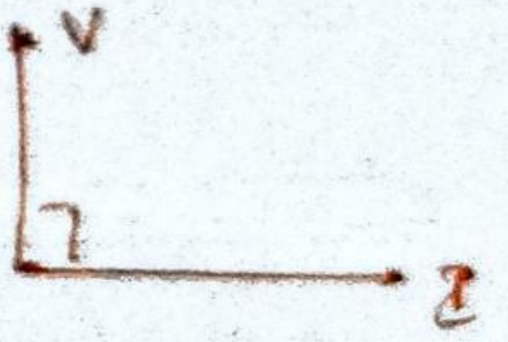
$$i = \frac{\varepsilon_0}{\left(\frac{1}{\omega C}\right)} \sin\left(\omega t + \pi/2\right)$$

$$q = C\varepsilon_0 \sin(\omega t)$$

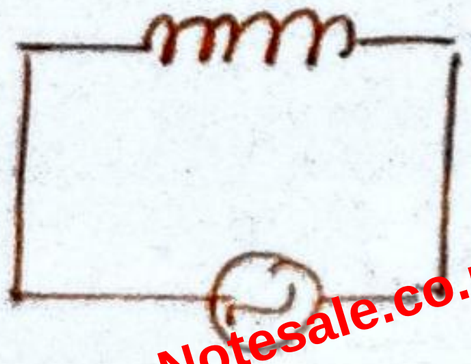
Capacitor



Inductor



* AC circuit with Inductor



Voltage or PD across Instrument & current

↓ Reactance

Resistance	Capacitor	Inductor
'R'	$X_C = \frac{1}{\omega C}$ $X_C = \frac{1}{2\pi f C}$	$X_L = \omega L$ $X_L = 2\pi f L$
	$f=0\ X_C \to \infty$	$f=0; X_L = 0$

* [Potential leads Current by $\pi/2$] *