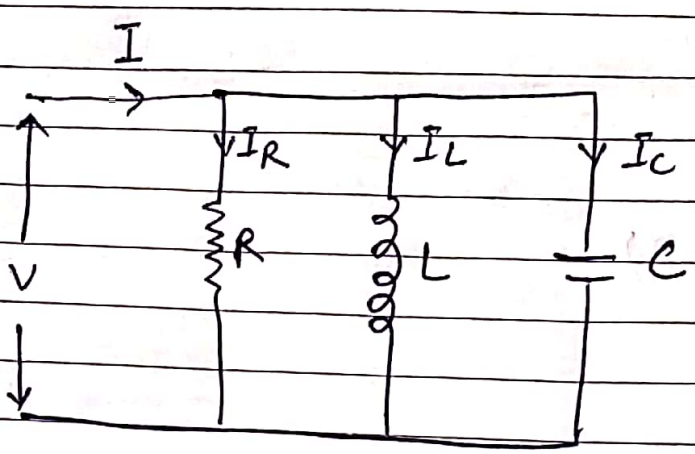
Parallel RLC Circuit :



$I_R = \frac{V}{R}$ (amp)

$I_L = \frac{V}{jX_L}$ (amp) (lag)

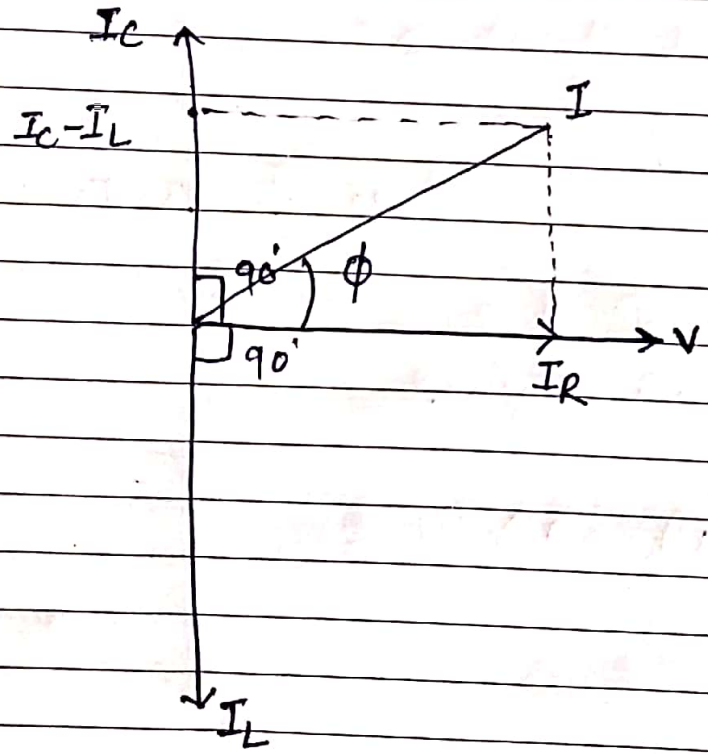
$I_C = \frac{jV}{X_C}$ (amp) (Lead)

$X_L = \omega L = 2\pi f L$

$X_C = \frac{1}{\omega C} = \frac{1}{2\pi f C}$

① phasor diagram :-

assume $I_C > I_L$



August'11

Monday	1	8	15	22	29
Tuesday	2	9	16	23	30
Wednesday	3	10	17	24	31
Thursday	4	11	18	25	
Friday	5	12	19	26	
Saturday	6	13	20	27	
Sunday	7	14	21	28	

Notes

Appointment

② Admittance :

$$I = I_R + I_L + I_C$$

$$I = \frac{V}{R} + \frac{V}{jX_L} + \frac{jV}{X_C}$$

$$\frac{I}{V} = \frac{1}{R} + \frac{1}{jX_L} + \frac{j}{X_C}$$

$$\frac{I}{V} = \frac{1}{R} - \frac{j}{X_L} + \frac{j}{X_C}$$

$$Y = G - jB_L + jB_C$$

$$Y = G + j(B_C - B_L) \quad \text{Rectangular form}$$

$$|Y| = \sqrt{G^2 + (B_C - B_L)^2} \ (\Omega^{-1}) \quad \text{Magnitude form.}$$

③ Power factor

$$\cos\phi = \frac{I_R}{I} = \frac{V/R}{V \cdot Y} = \frac{V \cdot G}{V \cdot Y}$$

$$\cos\phi = \frac{G}{Y}$$

$$\sin\phi = \frac{I_C - I_L}{I} = \frac{\frac{V}{X_C} - \frac{V}{X_L}}{V \cdot Y} = \frac{VB_C - VB_L}{V \cdot Y}$$

$$= \frac{B_C - B_L}{Y}$$

Notes

Appointment

④ Current :→

$$I = V\,Y$$

$$I = V \cdot \sqrt{G^2 + (B_C - B_L)^2} \quad (\text{amp})$$

⑤ Active Power :→

$$P = VI\cos\phi$$

$$= V \cdot V \cdot Y \cdot \frac{G}{Y}$$

$$= V^2 G \quad (\text{Watt})$$

⑥ Reactive Power :→

$$Q = VI\sin\phi$$

$$= V \cdot V \cdot Y \frac{(B_C - B_L)}{Y}$$

$$= V^2 (B_C - B_L) \quad (\text{VAR})$$

Apparent Power :-

$$S = V I \quad (VA)$$

$$= V \cdot V y$$

$$S = V^2 y$$