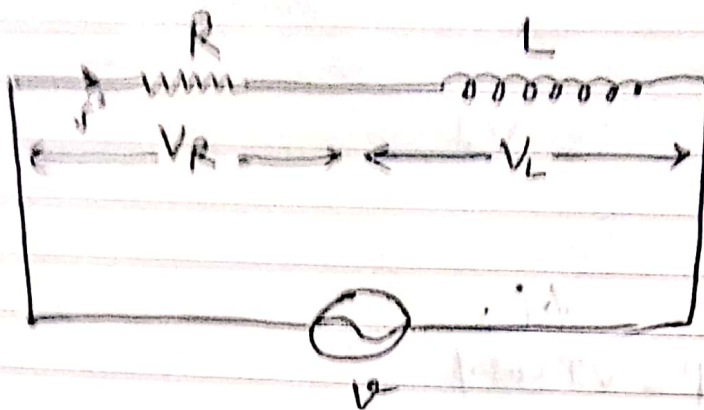


R-L Series Circuit



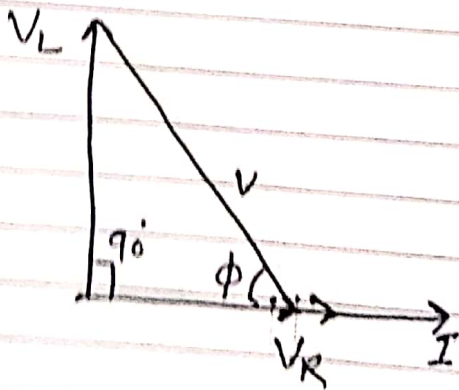
V = applied voltage

I = R.M.S value of current

V_R = voltage across resistance = IR (volt)

V_L = voltage across inductance = $I \cdot X_L$ (volt)

X_L = Inductive reactance = $\omega L = 2\pi fL$ (ohm)



① Impedance $\rightarrow (Z)$

$$V^2 = V_R^2 + V_L^2$$

$$V^2 = (IR)^2 + (IX_L)^2$$

$$V = \sqrt{I^2 R^2 + I^2 X_L^2}$$

$$V = I \sqrt{R^2 + X_L^2}$$

$$\frac{V}{I} = \text{Appointment} \sqrt{R^2 + X_L^2}$$

$$Z = \sqrt{R^2 + X_L^2} \text{ (ohm)}$$

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

$$Z = \sqrt{R^2 + (\omega L)^2}$$

$$= \sqrt{R^2 + (2\pi fL)^2}$$

② Current (I) : →

$$I = \frac{V}{Z} \text{ (Amp)}$$

$$I = \frac{V}{\sqrt{R^2 + X_L^2}}$$

$$= \frac{V}{\sqrt{R^2 + (\omega L)^2}} = \frac{V}{\sqrt{R^2 + (2\pi fL)^2}}$$

③ Power factor : →

$$\cos \phi = \frac{V_R}{V} = \frac{IR}{IZ}$$

$$\cos \phi = \frac{R}{Z}$$

$$\sin \phi = \frac{V_L}{V} = \frac{IX_L}{IZ}$$

$$\sin \phi = \frac{X_L}{Z}$$

④ Active Power : →

$$P = VI \cos \phi$$

$$= VI \cdot \frac{R}{Z} = \frac{V}{Z} \cdot I \cdot R = I \cdot I \cdot R$$

$$P = I^2 R \text{ (watt)}$$

September '11

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

⑤ Reactive Power :- \rightarrow

$$Q = V \cdot I \cdot \sin \phi$$

$$= V \cdot I \cdot \frac{X_L}{Z}$$

$$= \frac{V}{Z} \cdot I \cdot X_L$$

$$= I \cdot I \cdot X_L$$

$$Q = I^2 \cdot X_L \quad (\text{VAR})$$

⑥ Apparent Power :-

$$S = VI$$

$$= (I \cdot Z) I$$

$$S = I^2 Z \quad (\text{VA})$$

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					

Notes

Appointment