

# Resonance

**Def:-** Resonance is a phenomenon that occurs when the Reactance of the capacitor & inductor is the same

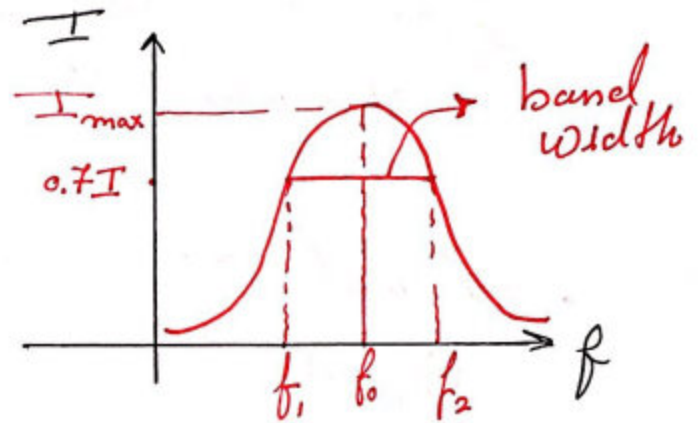
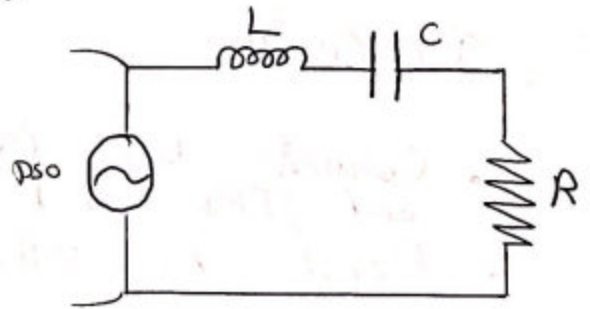
$$X_L = X_C$$

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

$$\rightarrow \omega_0 = \frac{1}{\sqrt{LC}}$$

$$\Rightarrow f = f_2 - f_1$$

= band width



## Quality factor

• A measure of the sharpness of the Resonance Curve

$$\rightarrow Q = \frac{f_0}{\Delta f} \quad (\text{experimentally})$$

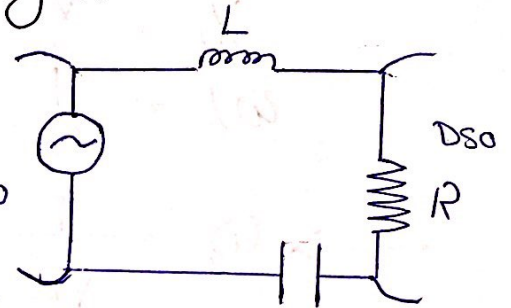
$$\rightarrow Q = \frac{1}{R} \sqrt{\frac{L}{C}} \quad (\text{Theoretically})$$

What we use :-

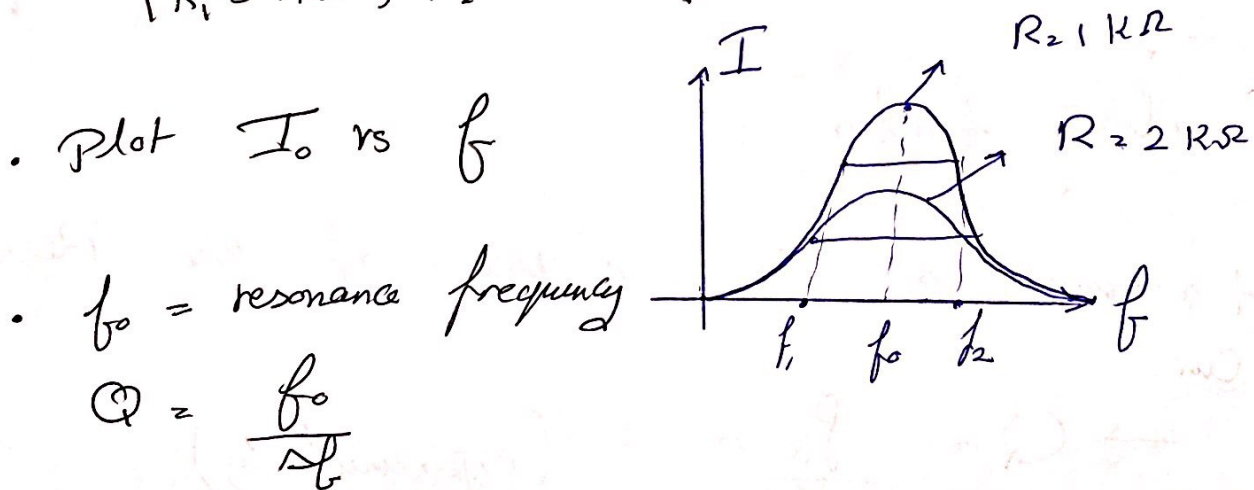
- L, C, R
- signal Generator & DSO

Procedure :-

- Connect this circuit - Using R once as  $R = 1\text{K}\Omega$  and then as  $R = 2\text{K}\Omega$
- Read the voltage values from the DSO when changing the frequency.



- Calculate  $I_0$  By dividing each value on R ( $R_1 = 1\text{K}\Omega$ ,  $R_2 = 2\text{K}\Omega$ )



- قَم بوجھ اللہ کا ہے موزن کبے سڈ فیم R :- 1KΩ فم 2KΩ
- قَم بقراءه قَم V م DSO عند كل صفة د f
- قَم كسل التيار بقبته قَم V على R
- ارضم I vs f واحد Q د f0