VIVEKANAND COLLEGE, KOLHAPUR

DEPARTMENT OF PHYSICS

PARALLEL RESONANCE LCR

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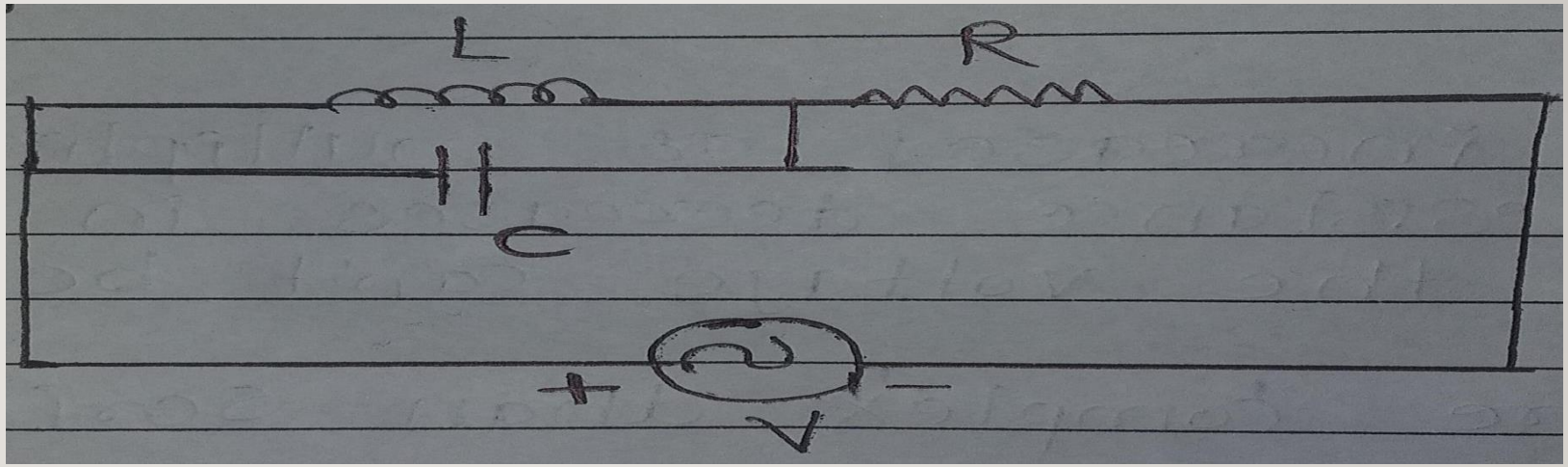
INTRODUCTION

- Parallel LCR circuit resonance occurs when Xc=Xl the frequency at which resonance occurs is called resonant frequency
- A parallel resonant circuit stores the circuit energy in magnetic field of the in dictor
- And the electric field of of the capacitor this energy is constantly being transferred back and forth between inductor and capacitor.

THEORY:

- A para1lel L-C circuit in which magnitude of capacitive and inductive reactances are exactly equal known as parallel resonant circuit



1. Voltage across each branch is same.

2. Each branch current is given byV/R

3. Reciprocal resistance formula is, 1/R=1/R1+1/R2+1/R3

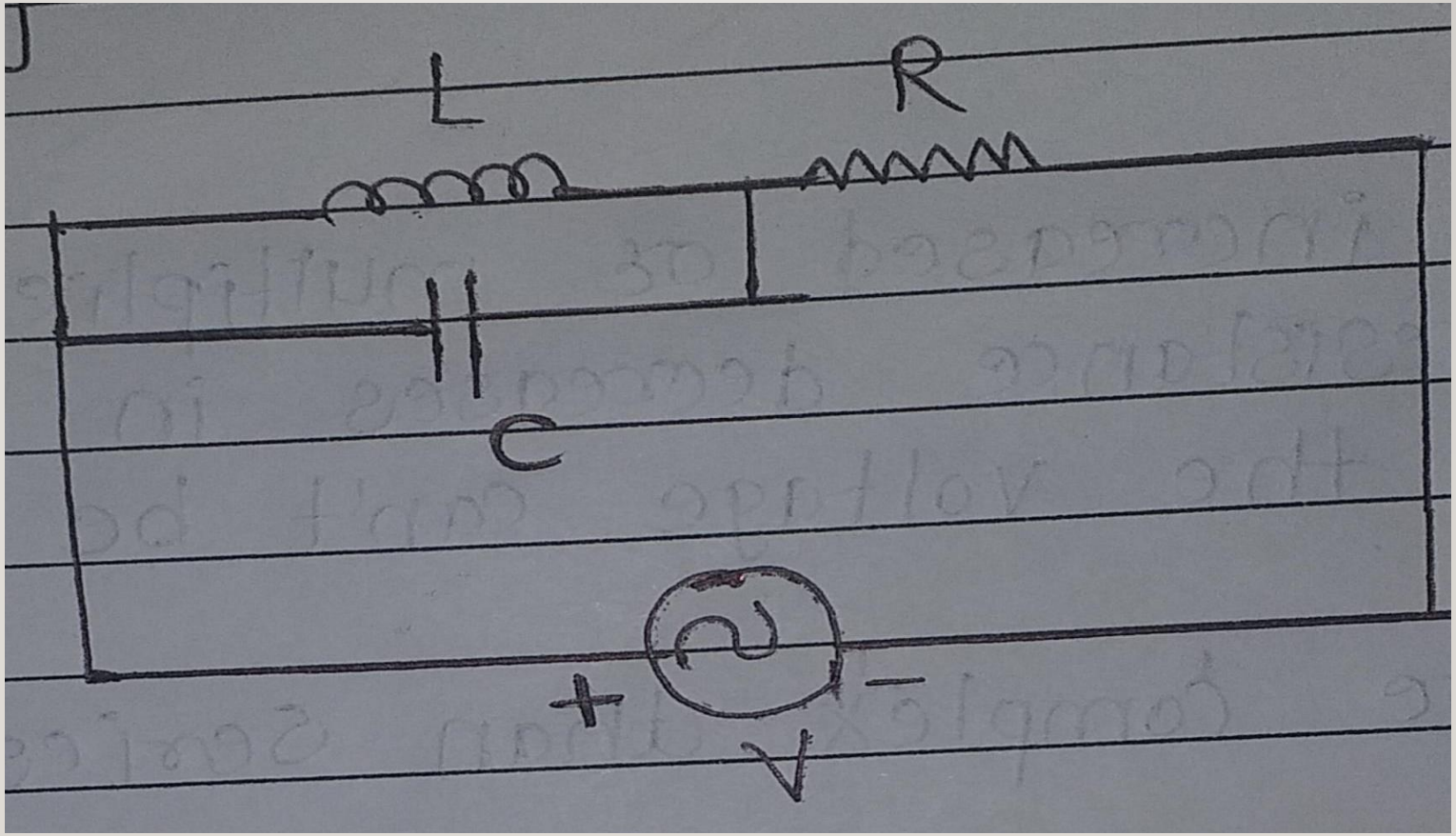
- Aim :

To study parallel LCR circuit and determine its resonant frequency and quality factor.

- Apparatus :

signal generator ,inductor,capacitor, resistance box

Diagram:



WORKING

In parallel LCR circuit the inductor,capacitor are connected in parallel across a voltage supply.

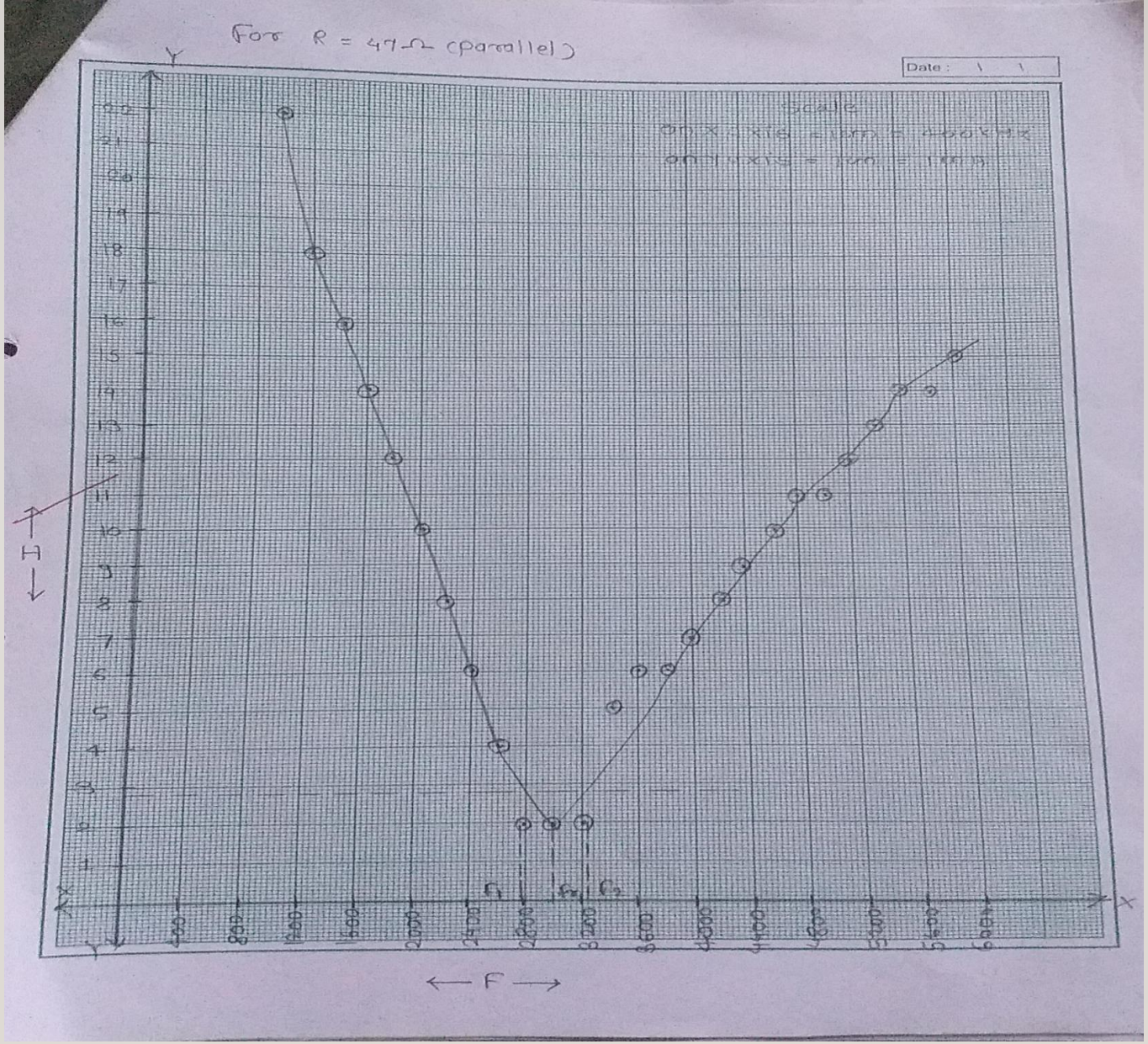
The applied voltage remains the same across all components and the supply current gets devided.Ic is the current flowing in the capacitor c ,iL is the current flowing in the inductor .

OBSERVATION TABLE:

Frequency	Current (I)mA 47 ohm
1000	22
1200	18
1400	16
1600	14
1800	12
2000	10
2200	8
2400	6
2600	4
2800	2
3000	2
3200	2
3400	5

Frequency	Current
3600	6
3800	6
4000	7
4200	6
4400	7
4600	8
4800	9
5000	10
5200	11
5400	11
5600	12
5800	13
6000	14

- **Graph**:



- **Calculation**

R= 47 ohm

$$Q =. \frac{F_r}{F2\text{-}F1}$$

Q = 3000/3240_ 2760

Q=6.25

RESULT:

- Resonant frequency =3000Hz

- Quality factor =6.25

APPLICATIONS

- The parallel resonance circuit is used for tuning purpose.
- The parallel resonance circuit is used in induction heating system.
- The parallel resonance circuit is used as current amplifier.
- It is also used as filter circuit

CONCLUSION

- The frequency responses curve of parallel resonance circuit shows that magnitude of current is a function of frequency and plotting this onto graph shows that, the response start at its maximum value ,reaches its minimum value at resonance frequency ,When Ir=Imin and then increase to maximum.


Thank
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