

Subject: \_\_\_\_\_

Date: \_\_\_\_\_

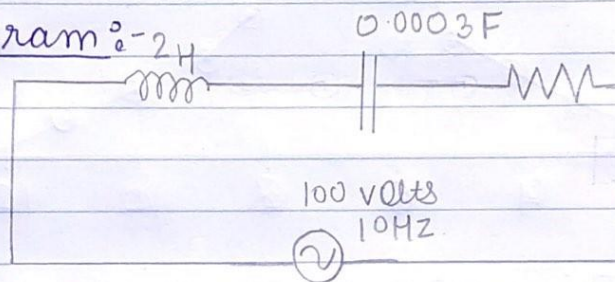
Experiment - 10

(a)

Aim :- To study the behavior of Series RLC circuit at resonance.

Apparatus :- A.C power source, Multimeter, Resistor, Capacitor, inductor and conducting wires.

Circuit diagram :-



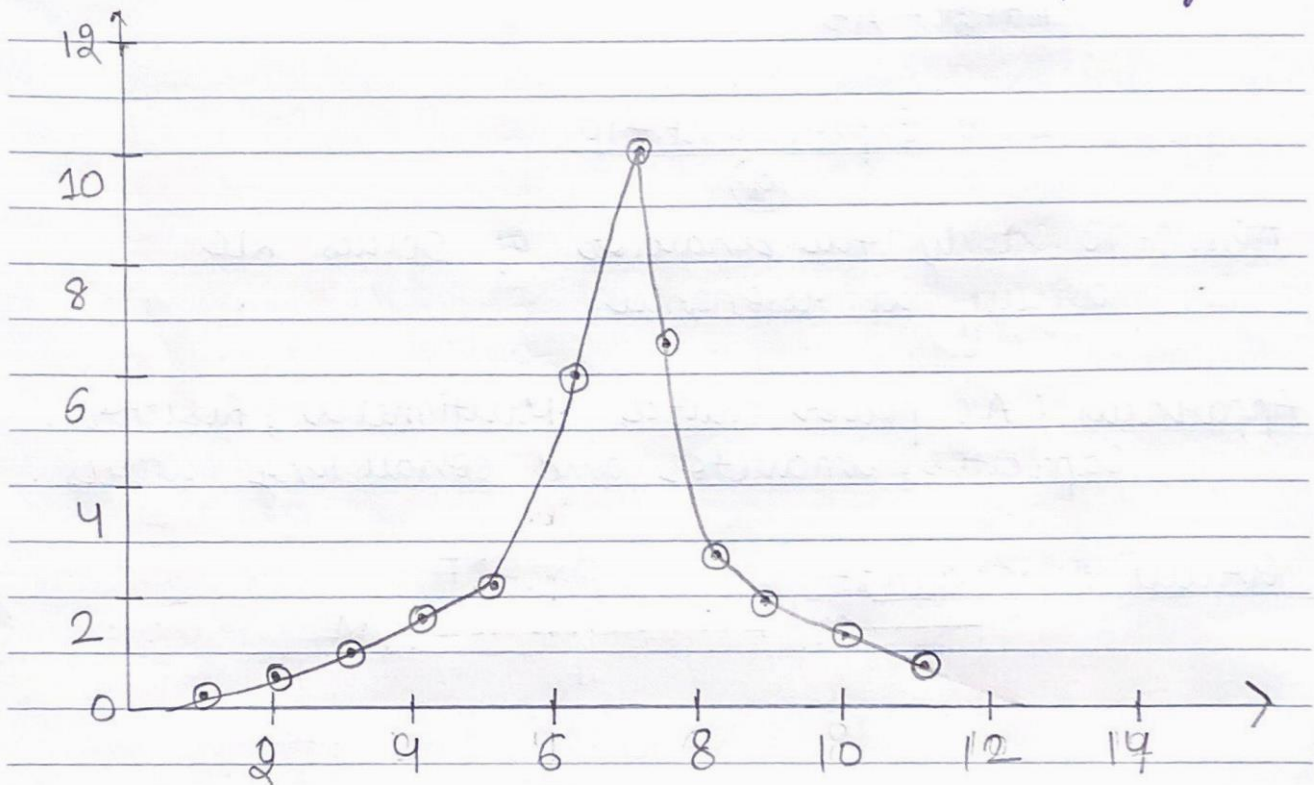
Observation Table :-

SNo.	Frequency (Hz)	Current (Ampere)
1	1	0.19
2	2	0.42
3	3	0.71
4	4	1.2
5	5	2.26
6	6	6.08
7	6.5	10.01
8	7	6.38
9	8	2.81
10	9	1.82
11	10	1.36
12	11	1.1

Subject: Graph :-

Date

Variation between current and frequency :-



Result :- The resonant frequency is approximately 6.5 Hz according to the graph which is equal to the value calculated theoretically.



Subject: \_\_\_\_\_

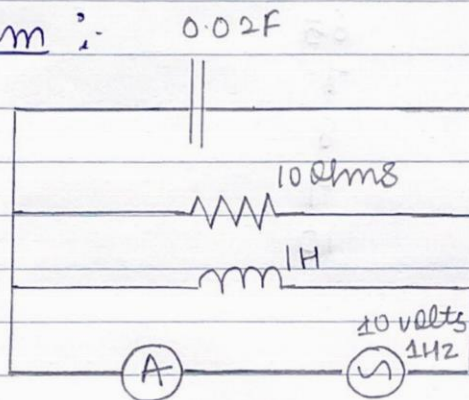
(6)

Date: \_\_\_\_\_

Aim :- To study the behavior of Parallel RLC circuit at resonance.

Apparatus Required :- AC power source, Rheostat, Capacitor, Inductor, Resistor, voltmeter, ammeter, connection wire etc.

Circuit diagram :-



Theory :-  $V_{ac} = 100 \text{ VRMS}$

$$f = 10 \text{ Hz}$$

$$L = 2 \text{ H}$$

$$C = 0.0003 \text{ F}$$

$$R = 10 \text{ } \Omega$$

According to ohm's law :-

$$I_L = \frac{V_L}{X_L} = 0.8 \text{ A} \quad I_C = \frac{V_C}{X_C} = 1.89 \text{ A}$$

$$I_R = \frac{V_R}{R} = 10 \text{ A}$$

$$\phi = \arctan \frac{I_X}{I_R}$$

$$I_X = \left( I_L^2 + I_C^2 \right)^{1/2} = 10.06 \text{ A}$$

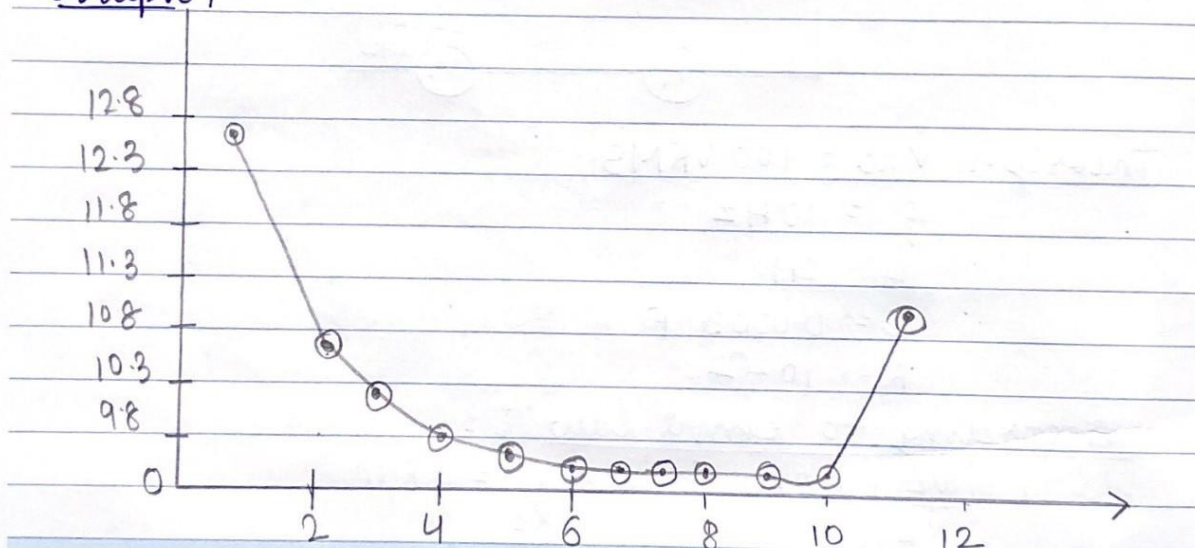
$$\phi = \arctan \frac{I_X}{I_R} = \boxed{6.214^\circ}$$

Subject: observation Table :-

Date

SNO.	Frequency (Hz)	Current (Ampere)
1	1	12.66
2	2	10.63
3	3	10.22
4	4	10.07
5	5	10.02
6	6	10.00
7	6.5	9.99
8	7	10.00
9	8	10.01
10	9	10.03
12	10	10.69

Graph :-



Result :- The resonant frequency calculated theoretically and by the virtual lab experiment were approximately same ( $= 6.5 \text{ Hz}$ ).