

Raiganj Surendranath Mahavidyalaya

Physics(Honours)

Part-II

Paper code-VII

Time-4hr

F.M-60

Group-A(Answer all the questions) 20x2=40

- 1) To study a series LCR ac circuit, draw its response curve also find its resonance frequency.

Experimental data:

Data for resonance curve-

Table -1: $R=337\Omega$, $L=56\text{mH}$, $C=0.22\mu\text{F}$, $V=2\text{v}$

No. of obs	Frequency f(Hz)	Voltage across R(Volt)	Current in mA
1	500	0.50	
2	600	0.61	
3	700	0.76	
4	800	0.90	
5	900	1.08	
6	1000	1.25	
7	1100	1.45	
8	1200	1.60	
9	1320	1.72	
10	1420	1.76	

11	1520	1.73	
12	1620	1.67	
13	1700	1.59	
14	1820	1.48	
15	1900	1.40	
16	2000	1.31	
17	2100	1.22	
18	2260	1.10	

Table-2: $R=337\Omega$, $L=56\text{mH}$, $C=0.1\mu\text{F}$, $V=2\text{v}$

No. of obs	Frequency f(Hz)	Voltage across R(Volt)	Current in mA
1	1000	0.49	
2	1200	0.66	
3	1400	0.87	
4	1600	1.13	
5	1800	1.43	
6	1900	1.55	
7	2000	1.67	
8	2100	1.70	
9	2150	1.71	
10	2200	1.70	
11	2300	1.66	
12	2400	1.59	
13	2500	1.49	
14	2700	1.32	
15	2900	1.15	
16	3000	1.07	
17	3200	0.92	

18	3400	0.83	
----	------	------	--

2.To study the LR circuit, find the value of inductance from V_L vs I graph.

Experimental data:

Table-1: $R=337\Omega$

Frequency f(Hz)	Voltage across R(V_R) in volt	Voltage across L(V_L) in volt	Current in mA $I = \frac{V_R}{R}$
1000	0.32	0.33	
	0.65	0.69	
	0.96	1.02	
	1.20	1.26	
	1.62	1.71	
1500	0.24	0.41	
	0.49	0.81	
	0.75	1.21	
	1.01	1.63	
	1.26	2.05	
2000	0.19	0.43	
	0.37	0.81	
	0.61	1.30	
	0.82	1.75	
	1.04	2.20	
2500	0.15	0.45	
	0.33	0.91	
	0.51	1.36	
	0.68	1.83	
	0.86	2.28	

Group-B(Answer all the questions) 5x4=20

- 1.What is the band width of a series resonant circuit?
- 2.An airplane with 20m wing spread is flying at 250m/s straight south parallel to the earth's surface. The earth's magnetic field has a horizontal component of $2 \times 10^{-5} \text{T}$ and the dip angle is 60° . Calculate the induce emf between the plane.
- 3.Can a series resonant circuit be used as an amplifier?
- 4.What is a choking coil?
- 5.What is the nature of the reactance of a series LCR Circuit
 - i)Below resonance
 - ii)Above resonance?