BARISHAL ENGINEERING COLLEGE

Department of Electrical & Electronic Engineering

LAB REPORT

Course Title : Electrical Circuit II Sessional.

Course Code : EEE-1202

Experiment No. : 01

Name of Experiment : To study the frequency Response of Series RLC circuit & determine the resonance frequency.

Date of Experiment : 09-12-2021

Submitted By

Name : Muhammad Jobayed Ibna Bashar

Class Roll : 192097

Exam Roll :

Reg. No. : 3115

Session : 2019-20

Semester : 2nd

Submitted To

Rabeya Akter

Assistant Professor

Dept. of EEE

Barishal Engineering College.

Date of Submission : 6-01-2022

Signature

Name of Experiment: To study the frequency response of series RLC circuit & determine the resonace frequency.

Aim: To observe the frequency response of a series RLC circuit & determine the resonance frequency of a series RLC circuit

Apparatus: (i) Audio frequency Generator.
(ii) CRO.
(iii) Multimeter.
(iv) Connecting wires/leads.
(v) AC power supply (Single phase)

Theory: In the series resonance circuit, The net reactance, $X = X_L - X_C$

So, The impedance of the circuit, $Z = \sqrt{R^2 + (X_L - X_C)^2}$

At the resonance frequency the capacitive reactance becomes equal to the inductive reactance.

$$X_L = X_C$$

$$\Rightarrow \omega_0 L = \frac{1}{\omega_0 C}$$

$$\Rightarrow f_0 = \frac{1}{2\pi\sqrt{LC}}$$

Circuit diagram:

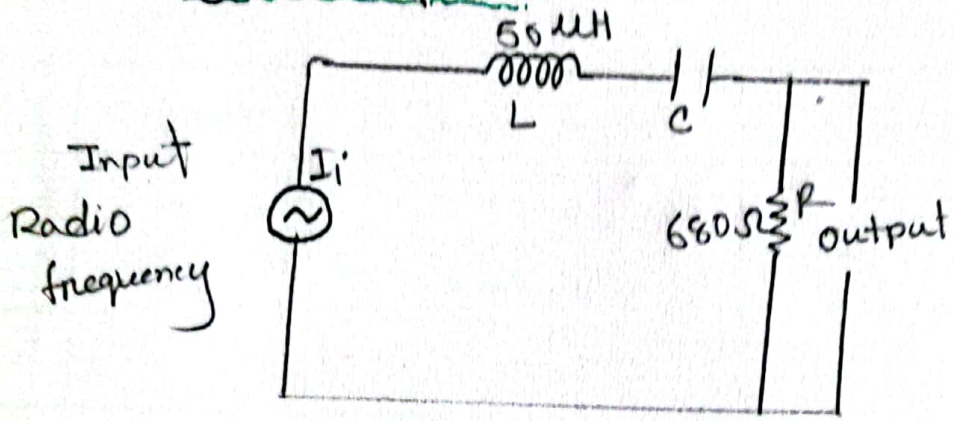


Figure :- Series RLC circuit

Procedure: (1) Make the connection as shown in figure.

(2) Frequency is given by the audio frequency generator.

(3) Change the frequency & note the reading carefully.

(4) At certain frequency voltage become max after which the voltage decrease. This is the resonance frequency.

(5) Plot a graph between plot & voltage.

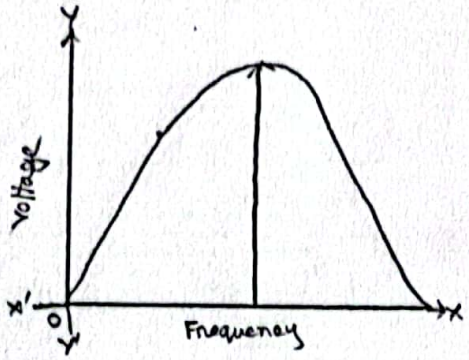
(6) Now, change value of resistor & repeat the procedure 3-5 for several values of R.

Data table:-

Sl No	Value of R	Frequency (GHz)	voltage (volts)
1	1.2 kΩ	22.26	3.2
2		49.82	3.4
3		94.38	3.3
1	1.5 kΩ	32.35	2.7
2		39.68	2.8
3		90.26	2.7
1	2 kΩ	25.50	1.9
2		46.64	2.1
3		71.28	1.7

Graph:-

According to the graph. The graph will like this.



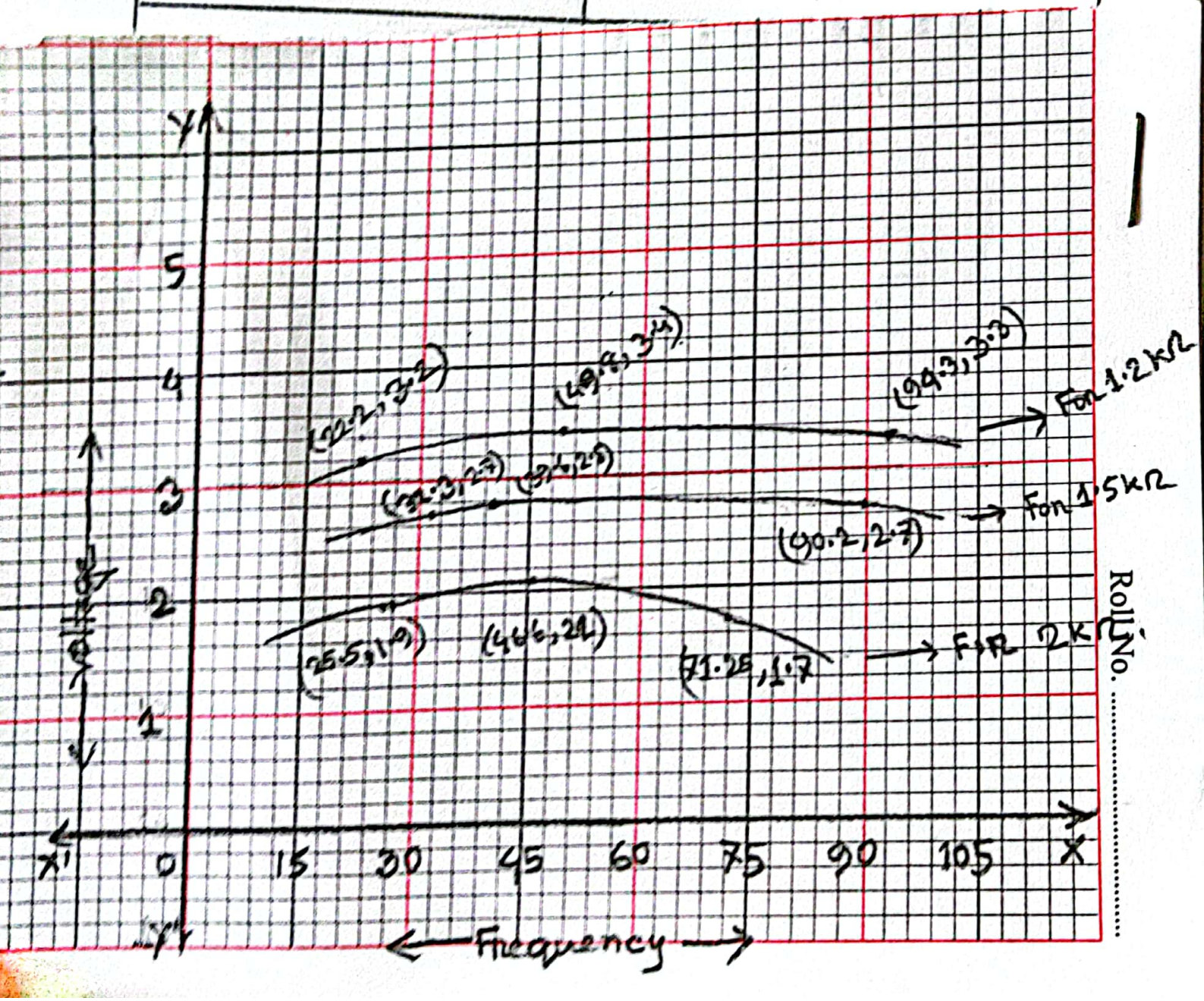
Precaution:- (i) All connection should be tight & correct.

(ii) Switch off the supply when not in used.

(iii) Reading should be taken carefully

Data table:

of R	Frequency (GHz)	voltage (volts)
	22.26	3.2
kΩ	49.82	3.4



BARISHAL ENGINEERING COLLEGE

Department of Electrical & Electronic Engineering

LAB REPORT

Course Title : Electrical Circuits II sessional.

Course Code : EEE - 1202

Experiment No. : 02

Name of Experiment : To study the frequency response of parallel RLC circuit & determine the resonance frequency

Date of Experiment : 23-12-2021

Submitted By

Name : Muhammad Jobayed Ibna Bashar

Class Roll : 192097

Exam Roll :

Reg. No. : 3115

Session : 2019-20

Semester : 2nd

Submitted To

Rabeya Akter

Assistant Professor

Dept of EEE

Barishal Engineering College.

Date of Submission : 6-01-2022

Signature

Name of experiment: To study the frequency response of parallel RLC circuit & determine the resonance frequency.

Aim: To observe the frequency response of pararrel RLC circuit and determine the resonance frequency of parallel RLC circuit.

Apparatus: (i) Audio frequency generator.
(ii) CRO.
(iii) Multimeter.
(iv) connecting wires.
(v) AC power supply (Single phase).

Theory: For the parallel RLC circuit,

$$I_C = I_L \sin\varphi_L$$

Again, $I_C = \frac{V}{X_C}$; $I_L = V/Z$

$$\therefore \sin\varphi_L = \frac{X_L}{Z}$$

$$\Rightarrow \frac{V}{Z} \times \frac{X_L}{Z} = \frac{V}{X_C}$$

$$\Rightarrow X_C \times X_L = Z^2$$

Now, $X_L = \omega L$, $X_C = \frac{1}{\omega C}$

$$\Rightarrow \frac{\omega L}{\omega C} = Z^2$$

$$\Rightarrow \frac{L}{C} = Z^2 = R^2 + X_L^2$$

$$\therefore f_0 = \frac{1}{2\pi}\sqrt{\frac{1}{LC} - \frac{R^2}{L^2}}$$

Circuit Diagram:

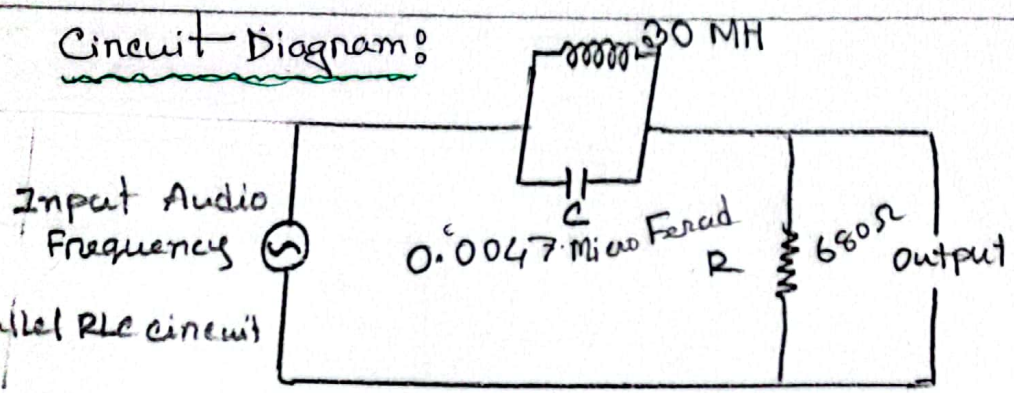


Fig: Parallel RLC circuit

Procedure: (i) Make the connection shown in figure.

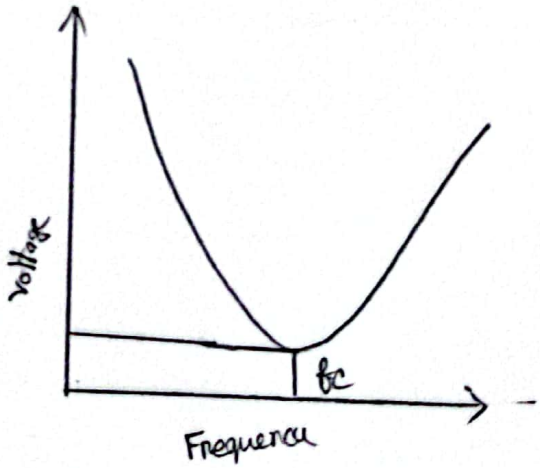
(ii) Frequency in given by the audio frequency generation.

(iii) Change the frequency and note carefully

(iv) At the cirtain frequency voltage becomes minimum after which the voltage increases. This in frequency.

(v) plot a graph between frequency and voltage.

Graph: According to these all graph. The graph will like this.



Data table:

Sl no	Resistance, R	Frequency (in Hz)	voltage (volts)
1	1.2 kΩ	32.46	2.9
2		46.33	2.2
3		88.12	2.5
1	1.5	26.13	2.6
2		49.32	2.4
3		79.15	3.1
1	2	34.75	3.8
2		61.26	3.1
3		94.62	3.6

Precaution: (i) All connections should be tight and correct.

(ii) Switch off the ruffly whe if not used.

(iii) Reading should be taken carefully.

a table:

e. R	Frequency (in Hz)	voltage (volts)
	32.46	2.9
Ω	46.33	2.2
	88.12	2.5
	26.13	2.6
	49.32	2.4