

Fall 2020

EEE/ETE 241L

Electrical Circuits-II Lab(Sec-4)

Faculty : Md. Abu Obaidah (AbO)

Instructor: Md. Rabiul Karim Khan

Lab No. :3

Date of Performance :8-12-20

Date of Submission : 13-12-20

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Experiment Name: Series RLC circuits.

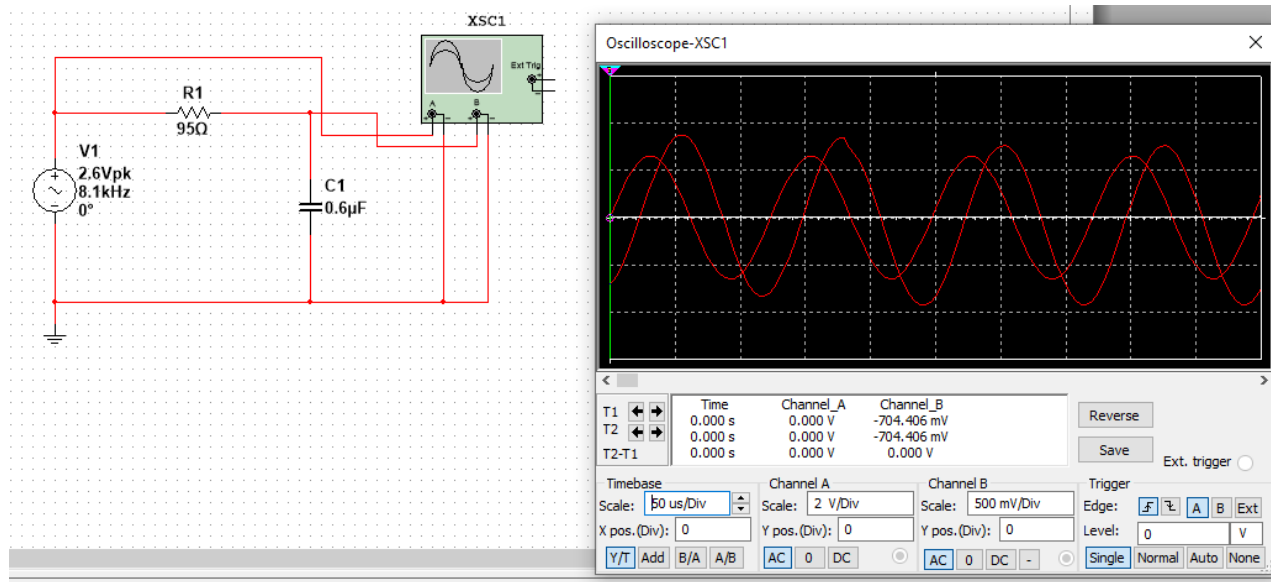
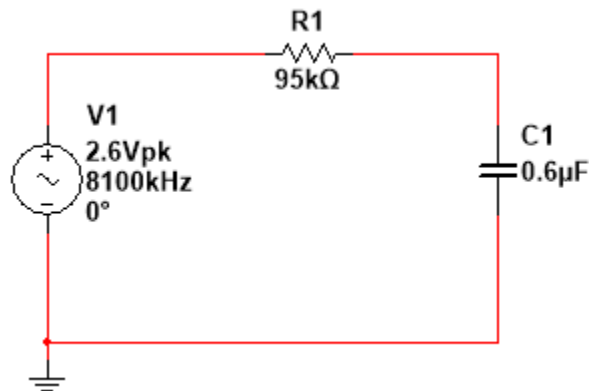
Objective:

- To analyze the relationship between the voltage and phase of reactive elements and the source in series RC, RL and RLC circuits.

Apparatus:

Components	Instruments.
<ul style="list-style-type: none">• Resistors: $1 \times 100\Omega$• Capacitors: $1 \times 1\mu\text{F}$• Inductor: $1 \times 330\mu\text{H}$	<ul style="list-style-type: none">• 1× Trainer Board• 1× Audio Generator• 1× Dual Channel Oscilloscope• Connecting wires and probes

Constructing circuit: (Series RC)



Swapping R and C:

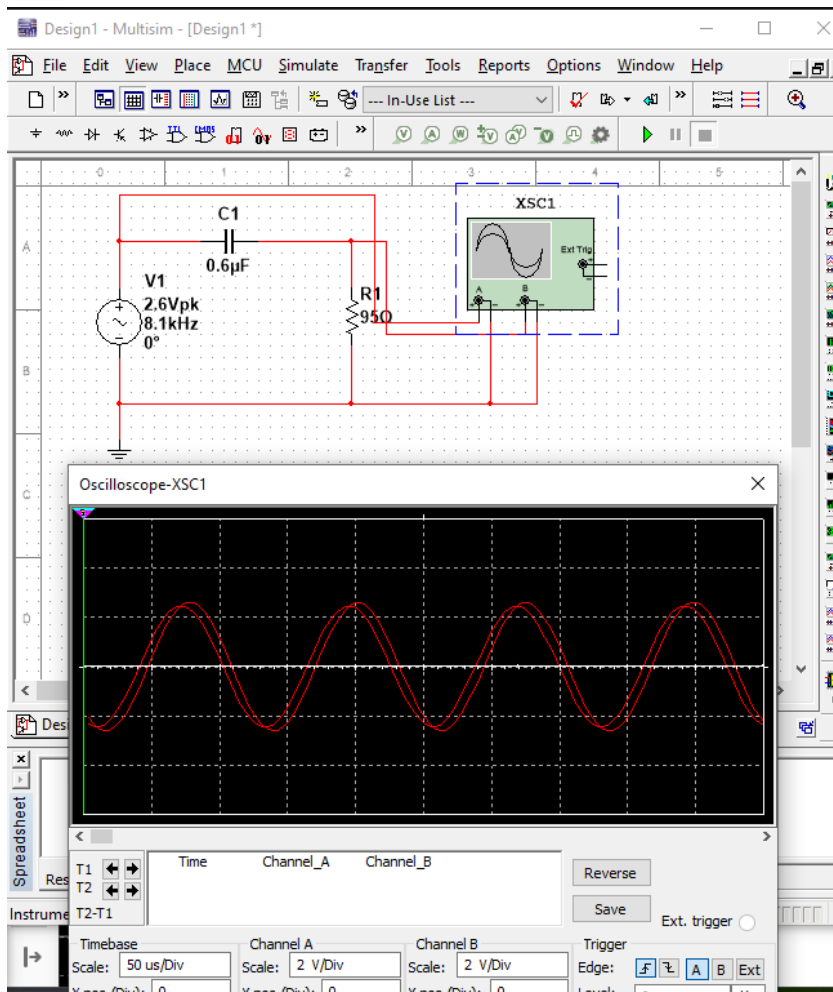


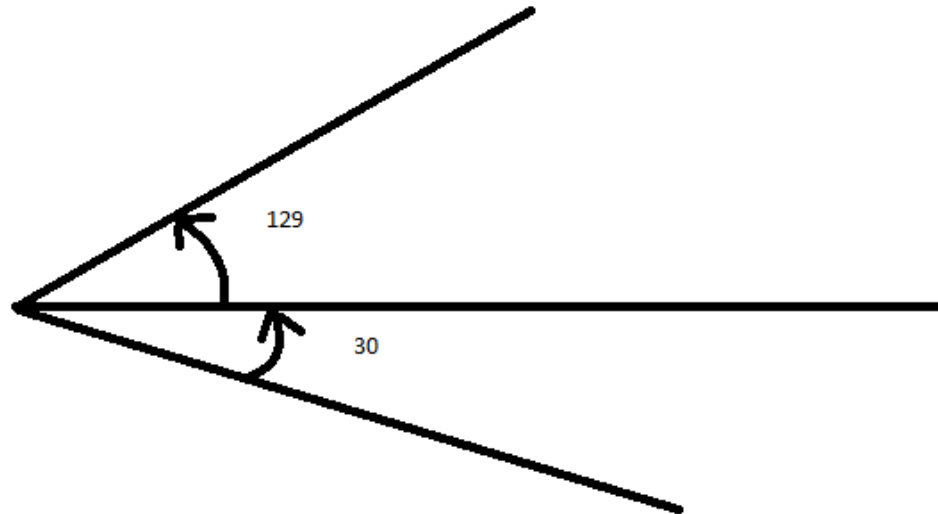
Table:

	V peak (Theory)	θ (Theory)	V peak (Practical) (V)	Delay ΔT (Practical) (μS)	θ (Practical) [ΔT x f x 360] (°)	% Difference V	% Difference θ
Vc			0.237	35.98	129.53		
VR			2.324	8.52	30.672		

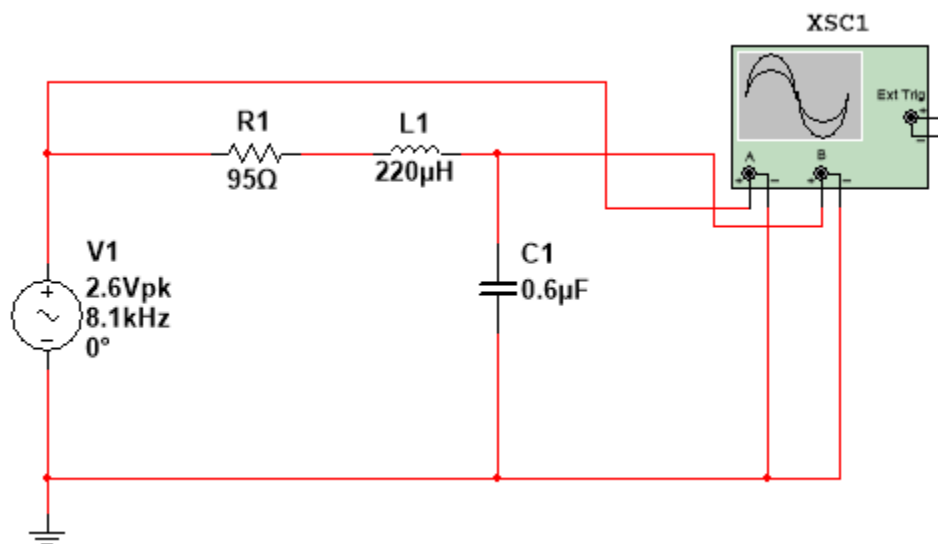
$$\Theta = \Delta T \times f \times 360 = (35.98 \times 10^{-6}) \times (10 \times 1000) \times (360) = 129.53$$

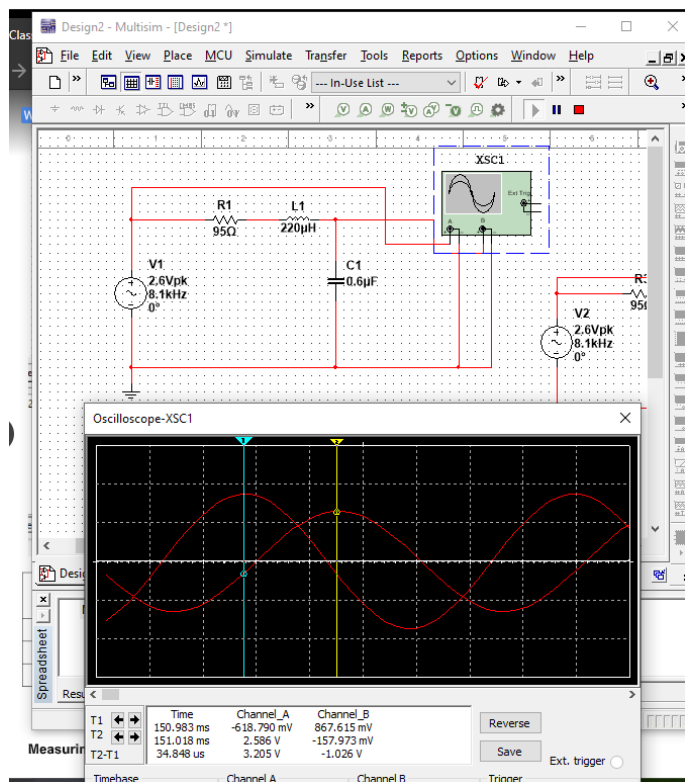
$$\Theta = \Delta T \times f \times 360 = (8.52 \times 10^{-6})(10 \times 1000)(360) = 30.672$$

Phasor diagram :

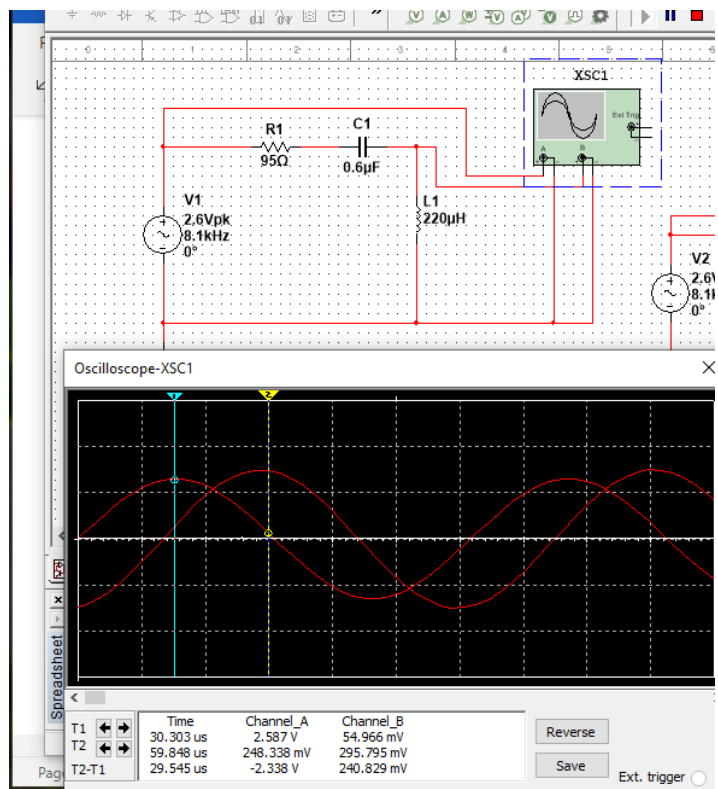


Constructing circuit: 3 (series RLC)

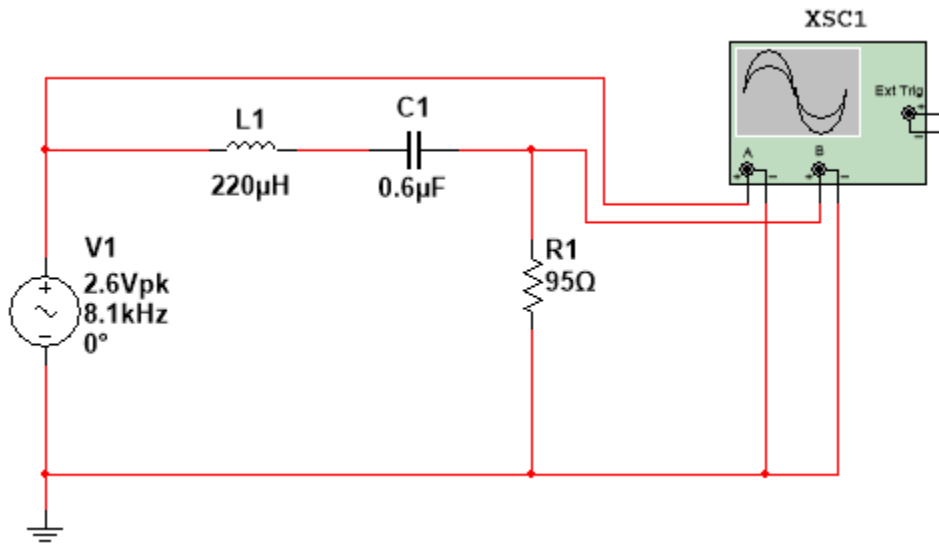




Swapping L and C:



Swapping R and L:



	Vpeak (Theory)	θ (Theory)	Vpeak (V) (Practical)	Delay ΔT (Practical) (μs)	θ (Practical) [ΔT x f x 360] (°)	% Difference V	% Difference θ
Vc			.867	34.84	119.1		
VL			.295	29.5	100.8		
Vr			2.9	2.39	8.02		

$$V_C = \theta = \Delta T \times f \times 360 = (34.84 \times 10^{-6})(9.5 \times 1000)(360) = 119.1$$

$$V_L = \theta = \Delta T \times f \times 360 = (29.5 \times 10^{-6})(9.5 \times 1000)(360) = 100.8$$

$$V_R = \theta = \Delta T \times f \times 360 = (2.4 \times 10^{-6})(9.5 \times 1000)(360) = 8.02$$

Ques and Ans :

- 1. No, it's impossible to find the value without switching the positions of the resistor and capacitor.
- 2. All are drawn in the lab report.
- 3. Yes, the practical readings confirm the theoretical values. Sometimes it differs a little bit.

Discussion: In this report there were three types of error. There are mechanical errors, Divine errors, personal errors. To minimize all errors, we have to measure three times and use the average value in the experiment. In all experiments, theoretical and experimental values are almost the same. Sometimes those values were not the same.