

Scope:

- Explore the response of systems with sinusoidal signals of different frequencies.
- Use the oscilloscope and the wave generator.
- Use phasors to represent sinusoids.
- Explore the concept of resonant frequency.

Home Preparations:

- Review Hambley Ch 5-6
- Perform the calculations and fill in the rows for calculations in Tables 5.1 and 5.2
- Prepare Tables.
- Illustrate your results with phasor diagrams.

Experiments:

1) Breadboard the circuit shown in Fig. 5.1 and apply a 10 V_{p-p} (10V peak-to-peak = 5V peak) sinusoidal signal. Using an oscilloscope, observe then record V_A and V_B, (the node voltage signals at A and B) for the three frequencies indicated on Table 5.1.

- Remember to connect at least one ground terminal of the o-scope probes to the circuit ground and the wave generator ground.
- Determine the magnitude of the gain and the phase angle between input and output voltages.
- From the measurements complete Table 5.1.

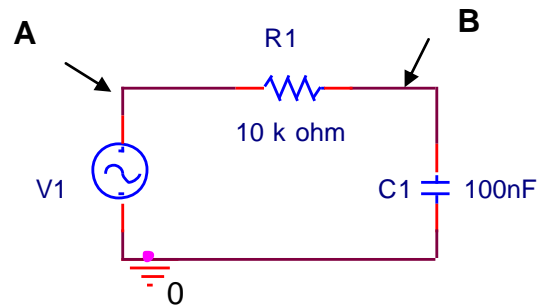


Fig. 5.1: RC circuit

Table 5.1: RC Circuit Responses			
	16 Hz	160 Hz	1,600 Hz
Prelab Calculations:			
V _A			
V _B			
V _B / V _A (gain mag.)			
Phase: V _B relative to V _A			
Lab Measurements:			
V _A			
V _B			
V _B / V _A (gain mag.)			
Phase: V _B relative to V _A			

2) Breadboard the circuit shown in Fig. 5.2 and apply a 5 V_{p-p} sinusoidal signal. Using an oscilloscope, observe V_A and V_B for the frequencies 800 Hz, 8 kHz, 80 kHz.

- Determine the magnitude of the gain and the phase angle between input and output voltages.
- From the measurements complete Table 5.2.

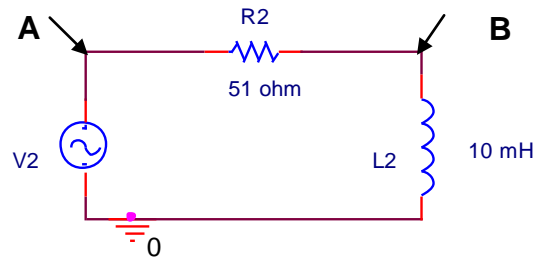


Fig. 5.2: RL circuit

Table 5.2: RL Circuit Responses			
	800 Hz	8 kHz	80 kHz
Prelab Calculations:			
V _A			
V _B			
V _B / V _A (gain mag.)			
Phase: V _B relative to V _A			
Lab Measurements:			
V _A			
V _B			
V _B / V _A (gain mag.)			
Phase: V _B relative to V _A			