Physics 112 Laboratory Report
Simple Oscillators

Name _____ Date_____

Lab Partner _____

Free oscillations

On a separate sheet, sketch one example each of underdamped, critically damped and overdamped decays, indicating the time scale on each.

Measured decay time τ when $R = 0$ _____

Driven oscillations

Resonant frequency f_0 _____

On a separate sheet, sketch v_C vs frequency. Does it look like Fig. 3?

Approximate phase shift at f_0 _____

Approximate phase shift at $f << f_0$ _____

Approximate phase shift at $f >> f_0$ _____

Are the phase shifts consistent with Fig. 3?

Frequencies for which v_C is reduced by $1/\sqrt{2}$ _____

Resonant width $\Delta\omega$ _____

Provide estimates of Q from the

resonant width $\Delta\omega$ _____

ratio of v_C to v_D _____

decay time τ _____

Are these estimates of Q consistent?

Radio circuit

capacitor setting	frequency (MHz)

Do these frequencies fall within the AM radio band?

Attach sketches of the voltage waveforms at the following locations. Clearly indicate the zero-voltage level in each sketch.

(a) Across the capacitor, with modulation on, but without the diode in the circuit.

(b) Across the 1kΩ resistor, with the diode in place.

(c) Across the earphone, with the diode in place.

Explain the difference between (a) and (b) in terms of the action of the diode.

Explain the lack of high frequency (near 1 MHz) signal in (c). Why is the time-average of this waveform not zero?

Describe some of the radio stations you can hear:

capacitor setting	program