ECEU574 Wireless Communication Circuits   Spring, 04
Assignment 4   Prof. Brady

1.) Problem 7, Rutledge, p. 65. Do all parts.
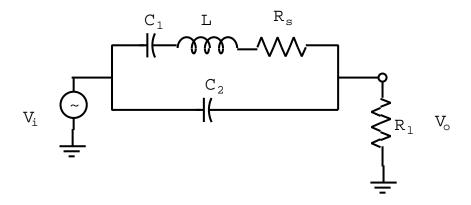
2.) Use phasor analysis on the following circuit:

Figure 1: Resonance Circuit.

a.) Find an expression for the two positive frequencies for which the circuit acts as a purely resistive device.

b.) For small R_s and C_2 relate these frequencies to two simpler resonant circuits, by neglecting some elements from the original circuit in each case. Determine the 3dB cutoff frequencies for each new circuit. Find the resonant frequency for each simpler circuit, along with an expression for the quality factor, Q, for each circuit.

c.) Does this circuit act as a series resonance circuit in any way? If so, how? Does this circuit act as a parallel resonance circuit? Be specific. Assume small R_s and C_2 for this part.

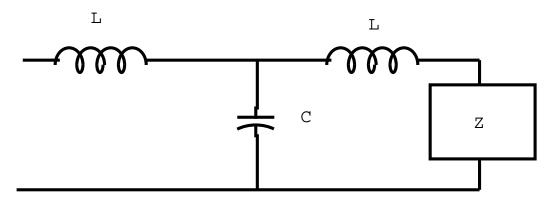**3.)** Consider the following circuit.

Figure 2: Circuit for Problem 3.

a.) Determine the equivalent impedance of this circuit.
b.) Suppose that this circuit operates on voltages with a frequency ω which satisfies $\omega^2 LC = 1$. What is the equivalent impedance for this case? What is an appropriate name for this circuit?