EECS 100/43
Lab 3 – Capacitors and Inductors

1. Objective

In this lab you learn about RC and RL circuits

2. Equipment

a. Breadboard
b. Wire cutters
c. Wires
d. Oscilloscope
e. Function Generator
f. 1k resistor x 2
g. 1uf capacitor
h. 8.2 mH inductor
h. Various connectors (banana plugs-to-alligator clips) for connecting breadboard to power supply and for multimeter connections.

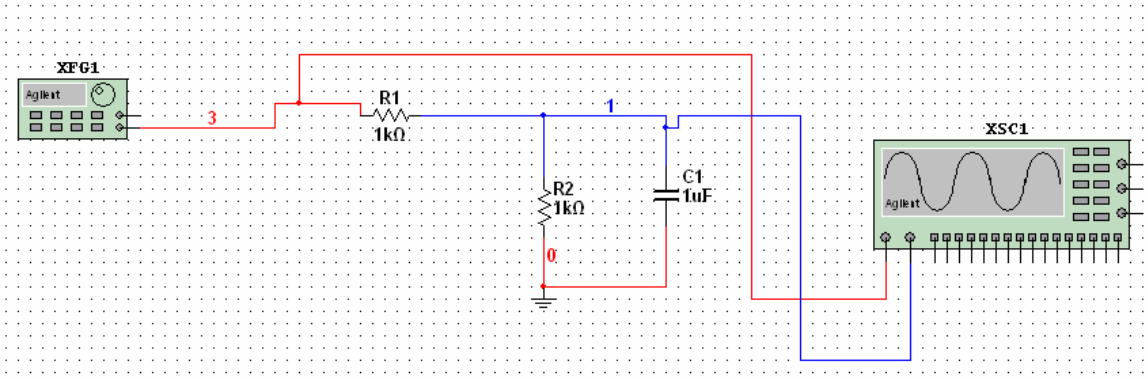
3. Theory

Thoroughly read chapters 6 and 7 from your book (skip sections mentioned the course handout).

4. PRELAB NAME:_____/SECTION____

Please turn in **INDIVIDUAL COPIES** of the prelab. They are due **10 MINUTES** after start of lab, **NO EXCEPTIONS!**

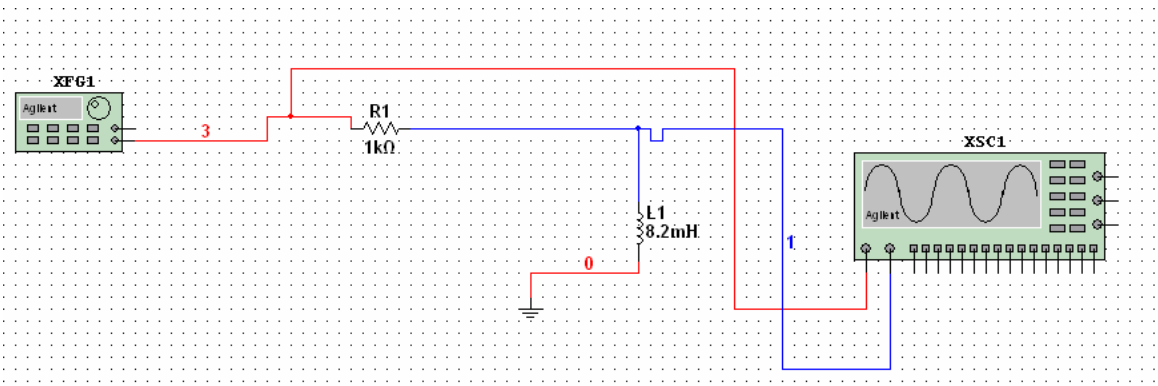
a. TASK 1: Build and simulate the circuit below in MultiSim. Compute the time constant and record it in table 1 (under the Report section).



Circuit 1. Simple RC circuit

Use 100 Hz frequency for the function generator, square wave setting. Make sure that in your oscilloscope you measure the function generator Vpp as 1.00 V (remember: function generator doubles the voltage shown on the display).

b. TASK 2 Build and simulate the following circuit in MultiSim. Compute the time constant and record it in table 2 (under the Report section).



Circuit 2. Simple RL Circuit

Use 1 kHz frequency for the function generator, square wave setting. Make sure that in your oscilloscope you measure the function generator Vpp as 1.00 V (remember: function generator doubles the voltage shown on the display).

PRELAB COMPLETE: _____ (TA CHECKOFF)

5. REPORT NAME(S):_____/SECTION____

a. TASK 1: Build the circuit from prelab task 1 on the breadboard. Use the oscilloscope cursor keys to measure the time constant, record it in table 1 and compare to the theoretical calculation.

Parameter	Theory	Experiment	% error
RC Time Constant			

Table 1. Compute and record RC time constant value

b. TASK 2: Build the circuit from prelab task 2 on the breadboard. Use the oscilloscope cursor keys to measure the time constant, record it in table 2 and compare to the theoretical calculation.

Parameter	Theory	Experiment	% error
RL Time Constant			

Table 2. Compute and record RL time constant value

TURN IN ONE REPORT PER GROUP AT THE END OF YOUR LAB SESSION. THERE IS NO TAKE HOME REPORT.

6. REVISION HISTORY

Date/Author	Revision Comments
Spring 2007/Bharathwaj Muthuswamy	Typed up source documentation, organized lab report, typed up solutions.