

PROBLEM SET #2

PROBLEM #1

```
% Assign the parameters
L=1.436e-3;
C=100e-6;
R = 10.0;

% Assign a convenient range of frequencies
w = 2*pi*linspace(0, 3e3, 5000);

% Evaluate the expression
v1 = L*C*w.*w -1.0;
H = j*v1./(j*v1 + R*C*w);

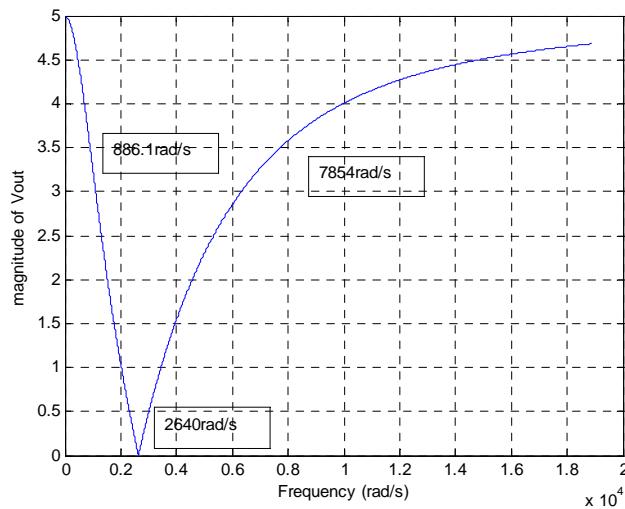
% Find the magnitude
Hmag = abs(H);

% Find Vout
Vin = 5.0*exp(j*60*pi/180);
Vout = Hmag*abs(Vin);

% Plot the result
plot(w,Vout)
xlabel('Frequency (rad/s)')
ylabel('magnitude of Vout')
grid on

% Find the indices that satisfy the magnitude check
xx = find((Vout<3.538) & (Vout>3.534));
% find the index corresponding to the notch frequency
xx2 = find(Vout < 1e-3);

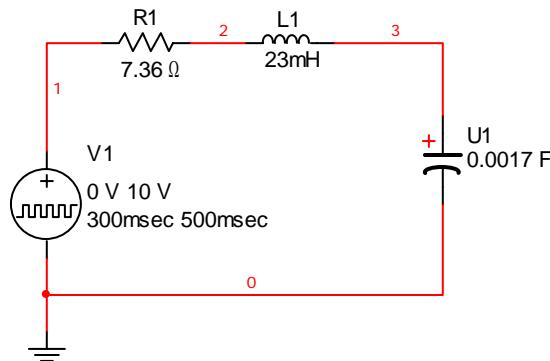
% Display those frequencies (add to fig with INSERT TEXTBOX
w(xx)
w(xx2)
```



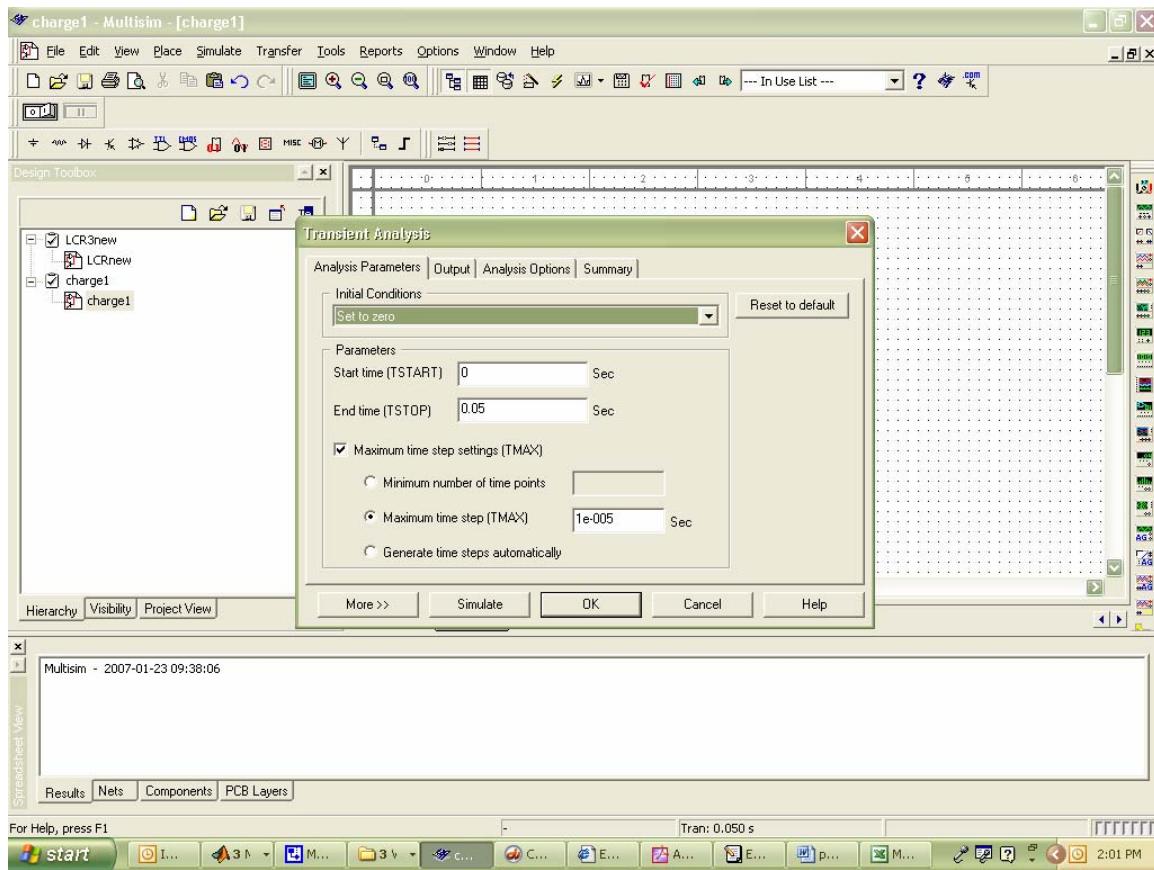
PROBLEM #2

$$R = 0.736 \frac{10V}{1A} = 7.36\Omega \quad L = \frac{7.36\Omega(0.05s)}{16} = 23mH \quad C = \frac{4(23mH)}{(7.36\Omega)^2} = 1.7mF$$

Build the circuit in Multisim



Set up simulation study. Choose output variables \$3 (node voltage 3) and II1#branch (inductor 1 current).



Import data into Excel by selecting third icon from the right in the Grapher View window. Save the file. Then in Matlab, choose FILE -> IMPORT DATA. The data appears columnwise in a variable names data: time in the first and fourth columns; voltage and current in the second and fifth columns. Then plot it. Here I show how to use the subplot command that enables you to stack plots.

```
t = data(:,1);
v = data(:,2);
i = data(:,5);

subplot(211)
plot(t,v)
grid on
xlabel('time (sec)')
ylabel('voltage (V)')

subplot(212)
plot(t,i)
grid on
xlabel('time (sec)')
ylabel('current (A)')
```

