

ECE 209 COMPUTER ASSIGNMENT #1

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OrCAD Demo CD can be requested at

<http://www.orcad.com/downloads/form/cdrequest.asp>


Use PSpice.


1. Draw the schematic shown in Fig.1. The Part Name for printers are IPRINT, VPRINT1, VPRINT2. Click IPRINT. Right click and select Edit Properties.... Type Y inside the box under AC, DB, REAL, IMAG, MAG, PHASE. If any one of these fields does not appear, click New Column..., type in the name. Repeat for VPRINT1 and VPRINT2. In the analysis tab, select AC Sweep/Noise and select General Settings for Options:. Select Linear for AC Sweep Type. Enter 200 (in Hz) for Start Frequency:, 200 (in Hz) for End Frequency:, 1 for Total Points: as shown in Fig.8.22. Click OK. Find the voltages and currents everywhere.

2. Draw the schematic of the circuit shown in Fig.2. Find the current, voltage across the resistor, current across the inductor. In the analysis tab, select AC Sweep/Noise and select General Settings for Options:. Select Linear for AC Sweep Type. Enter 200 (in Hz) for Start Frequency:, 200 (in Hz) for End Frequency:, 1 for Total Points:. Click OK.


3. Draw the schematic of the circuit shown in Fig.3. Include all the plots in your report. In the analysis tab, select AC Sweep/Noise and select General Settings for Options:. Select Linear for AC Sweep Type. Enter 0.1 (in Hz) for Start Frequency:, 10000 (in Hz) for End Frequency:, 1000 for Total Points:. Click OK. The Start Frequency cannot be zero. Click Trace, Add Trace (or just click Add Trace button on the toolbar ). In the Add Trace window, click M() from the Functions and Macros (right side), and then click V(C1:2). Click OK. Click Trace, Delete All Traces in the SCHEMATIC1 – ac1 – PSpice A/D Lite window. Select Trace, Add Trace or click on the Add Trace button in the toolbar. Click P() from the Functions and Macros (right side), and then click V(C1:2). Click OK.


Instead of two the separate plots, the magnitude response and the phase response can be plotted in one plot. Click Trace, Delete All Traces in the SCHEMATIC1 – ac1 – PSpice A/D Lite window. Increase the size of the window by dragging the mouse at the lower right corner of the window. Click Trace, Add Trace (or just click Add Trace button on

the toolbar ). In the Add Trace window, click M() from the Functions and Macros (right side), and then click V(C1:2) Click OK. Click Plot, Add Plot to Window. Notice that the second plot is selected at this point. Click Trace, Add Trace (or just click Add


Trace button on the toolbar ). In the Add Trace window, click P() from the Functions and Macros (right side), and then click V(C1:2) Click OK. Click Trace, Delete

All Traces. Click the plot of $M(V(C1:2))$ to select it. Click Trace, Delete All Traces.


Trace, Add Trace (or just click Add Trace button on the toolbar ). In the Add Trace window, click $M()$ from the Functions and Macros (right side), and then click $V(R1:1)$. Press ← key on the keyboard to move the cursor inside the right parenthesis). Press – key on the keyboard. Click $V(R1:2)$ and click OK. Click the second plot (top) to select it. Click $P()$ from the Functions and Macros (right side), and then click $V(R1:1)$. Press ← key on the keyboard to move the cursor inside the rightmost parenthesis. Press – key on the keyboard. Click $V(R1:2)$ and click OK. Click Trace, Delete All Traces. Click the plot of $M(V(R1:1)-V(R1:2))$ to select it. Click Trace, Delete All Traces. Trace, Add


Trace (or just click Add Trace button on the toolbar ). In the Add Trace window, click $M()$ from the Functions and Macros (right side), and then click $I(R1)$. Click OK. Click the second plot (top) to select it. Click $P()$ from the Functions and Macros (right side), and then click $I(R1)$. Click OK.

In the Orcad Capture – Lite Edition window, click PSpice, Edit Simulation Profile (or click the Edit Simulation Settings button in the toolbar). Simulation Settings – ac1 window appears. In the analysis tab, select AC Sweep/Noise and select General Settings for Options:. Select Logarithmic for AC Sweep Type. Select Decade under Logarithmic. Enter 0.1 (in Hz) for Start Frequency:, 100000 (in Hz) for End Frequency:, 100 for Points/Decade:. Click OK. The Start Frequency cannot be zero. Click PSpice, Run. SCHEMATIC1 – ac1 – PSpice A/D Lite window appears. Click Trace, Add Trace (or


just click Add Trace button on the toolbar ). In the Add Trace window, click $M()$ from the Functions and Macros (right side), and then click $V(C1:2)$. Click OK.

Click Trace, Delete All Traces in the SCHEMATIC1 – ac1 – PSpice A/D Lite window. Select Trace, Add Trace or click on the Add Trace button in the toolbar. Click $P()$ from the Functions and Macros (right side), and then click $V(C1:2)$. Click OK. Instead of two the separate plots, the magnitude response and the phase response can be plotted in one plot. Click Trace, Delete All Traces in the SCHEMATIC1 – ac1 – PSpice A/D Lite window. Increase the size of the window by dragging the mouse at the lower right corner of the window. Click Trace, Add Trace (or just click Add Trace button on the toolbar


). In the Add Trace window, click $M()$ from the Functions and Macros (right side), and then click $V(C1:2)$ Click OK. Click Plot, Add Plot to Window. The space for the second plot is created above the first plot. Notice that the second plot is selected at this

point. Click Trace, Add Trace (or just click Add Trace button on the toolbar ). In the Add Trace window, click $P()$ from the Functions and Macros (right side), and then click $V(C1:2)$ Click OK.


Click Trace, Delete All Traces. Click the plot of $M(V(C1:2))$ to select it. Click Trace,

Delete All Traces. Trace, Add Trace (or just click Add Trace button on the toolbar ). In the Add Trace window, click $M()$ from the Functions and Macros (right side), and then click $V(R1:1)$. Press ← key on the keyboard to move the cursor inside the right

parenthesis). Press – key on the keyboard. Click V(R1:2) and click OK. Click the second plot (top) to select it. Click P() from the Functions and Macros (right side), and then click V(R1:1). Press ← key on the keyboard to move the cursor inside the rightmost parenthesis. Press – key on the keyboard. Click V(R1:2) and click OK.

Click Trace, Delete All Traces. Click the plot of M(V(R1:1)-V(R1:2)) to select it. Click Trace, Delete All Traces. Click Trace, Add Trace (or just click Add Trace button on the toolbar ). In the Add Trace window, click M() from the Functions and Macros (right side), and then click I(R1). Click OK. Click the second plot (top) to select it. Click P() from the Functions and Macros (right side), and then click I(R1). Click OK.

Click Trace, Delete All Traces. Click the plot of M(I(R1)) to select it. Click Trace, Delete All Traces. Click Plot, Delete Plot. The window has only one plot area. You can adjust the size of the window by dragging the lower right corner of SCHEMATIC1 – ac1 – PSpice A/D Lite window.


Click Trace, Add Trace (or just click Add Trace button on the toolbar ). In the Add Trace window, click DB() from the Functions and Macros (right side), and then click V(C1:2).

Notice that the magnitude response shown above is the Bode plot for V(C1:2). The dB magnitude DB(V(C1:2)) represents

$$DB(V(C1:2)) = 20 \times \log_{10}|V(C1:2)|$$


Click Trace, Delete All Traces in the SCHEMATIC1 – ac1 – PSpice A/D Lite window. Select Trace, Add Trace or click on the Add Trace button in the toolbar. Click DB() from the Functions and Macros (right side), and then click V(R1:1). Press ← key on the keyboard to move the cursor inside the rightmost parenthesis. Press – key on the keyboard. Click V(R1:2) and click OK.


4. Draw the schematic shown in Fig.4. Include all the plots in your report. In the analysis tab, select AC Sweep/Noise and select General Settings for Options:. Select Logarithmic, Decade for AC Sweep Type. Enter 1 (in Hz) for Start Frequency:, 100MEG (in Hz) for End Frequency:, 100 for Points/Dec. Under Options:, click the box to the left of Parametric Sweep to select it. Select Global parameter for Sweep variable. Type RVAL for Parameter name:. For Sweep type, select Logarithmic, Decade. Enter 10 for Start value:, 100k for End value:, 1 for Points/Decade:. Click OK. Click PSpice, Run. Available Sections window with all sections highlighted appears. Click OK. SCHEMATIC1 – ac-param-1 – PSpice A/D Lite window appears. Click Trace, Add


Trace (or just click Add Trace button on the toolbar ). In the Add Trace window, click M() from the Functions and Macros (right side), and then click V(C1:2). Click OK.

Click Trace, Delete All Traces in the SCHEMATIC1 – ac1 – PSpice A/D Lite window. Select Trace, Add Trace or click on the Add Trace button in the toolbar. Click P() from the Functions and Macros (right side), and then click V(C1:2). Click OK.

Instead of two the separate plots, the magnitude response and the phase response can be plotted in one plot. Click Trace, Delete All Traces in the SCHEMATIC1 – ac1 – PSpice A/D Lite window. Increase the size of the window by dragging the mouse at the lower right corner of the window. Click Trace, Add Trace (or just click Add Trace button on

the toolbar ). In the Add Trace window, click M() from the Functions and Macros (right side), and then click V(C1:2) Click OK. Click Plot, Add Plot to Window. Notice that the second plot is selected at this point. Click Trace, Add Trace (or just click Add

Trace button on the toolbar ). In the Add Trace window, click P() from the Functions and Macros (right side), and then click V(C1:2) Click OK.

Click Trace, Delete All Traces. Click the plot of M(V(C1:2)) to select it. Click Trace, Delete All Traces. Trace, Add Trace (or just click Add Trace button on the toolbar ). In the Add Trace window, click M() from the Functions and Macros (right side), and then click V(R1:1). Press ← key on the keyboard to move the cursor inside the right parenthesis). Press – key on the keyboard. Click V(R1:2) and click OK. Click the second plot (top) to select it. Click P() from the Functions and Macros (right side), and then click V(R1:1). Press ← key on the keyboard to move the cursor inside the rightmost parenthesis. Press – key on the keyboard. Click V(R1:2) and click OK.

5. Draw the schematic of the circuit shown in Fig.5.

Voltage source: VAC

Analysis type:

AC Sweep/Noise, General Settings, AC Sweep Type: Logarithmic, Decade,
Start Frequency: 1Hz
End Frequency: 1G
Points/Decade: 100

Parametric Sweep:

Sweep variable: Global parameter,
Parameter name: RVAL
Sweep type: Logarithmic, Decade
Start value: 50
End value: 100k
Points/Decade: 1

Plot M(V2(C1)) and P(V2(C1)) on the same graph. What type of filter is this?

Plot M(V(L1:1)-V(L1:2)) and P(V(L1:1)-V(L1:2)) on the same graph. What type of filter is this?

Plot M(V(R1:1)-V(R1:2)) and P(V(R1:1)-V(R1:2)) on the same graph. What type of filter is this?

Plot $M(V(L1:1))$ and $P(V(L1:1))$ on the same graph. What type of filter is this?

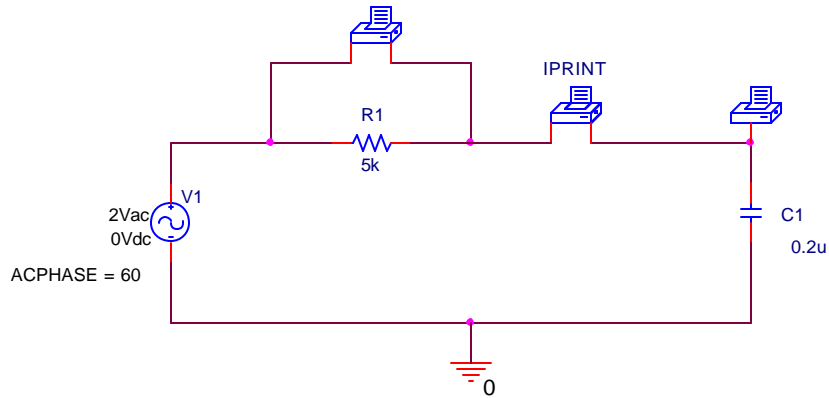


Fig.1

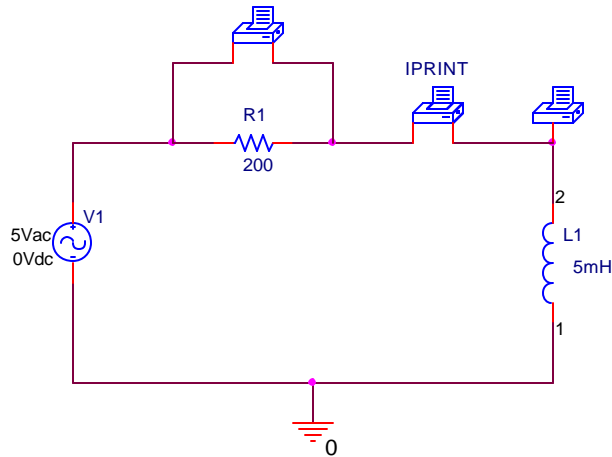


Fig. 2

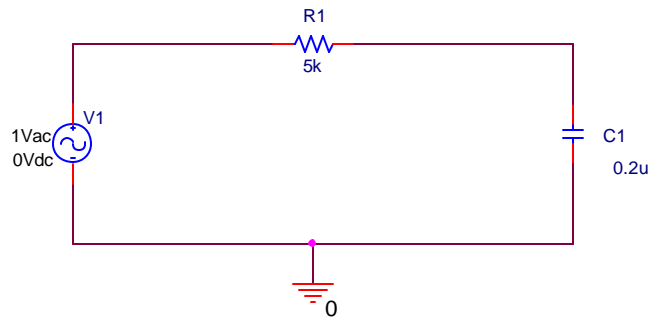
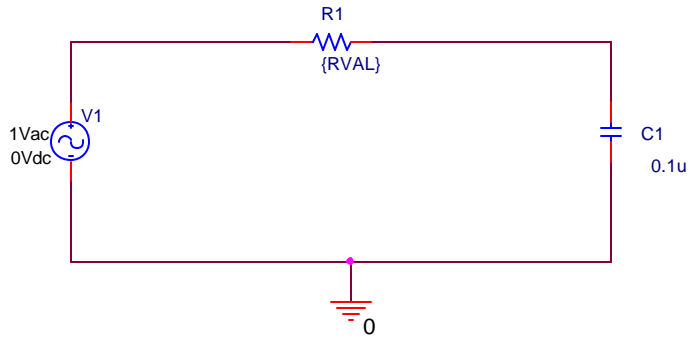
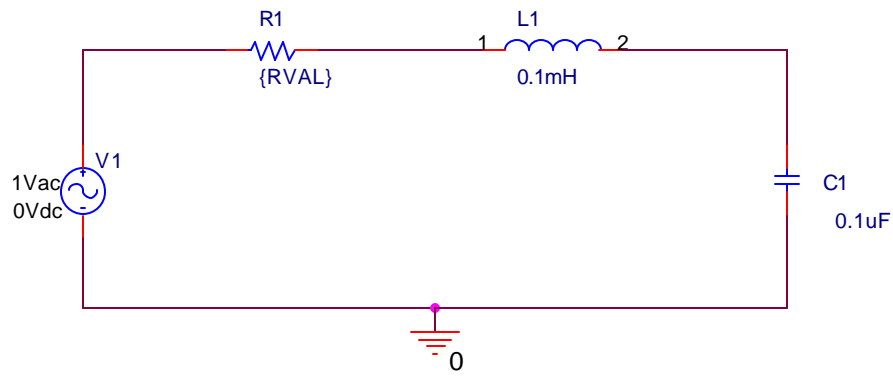


Fig.3



PARAMETERS:
RVAL = 10

Fig.4



PARAMETERS:
RVAL = 50

Fig.5