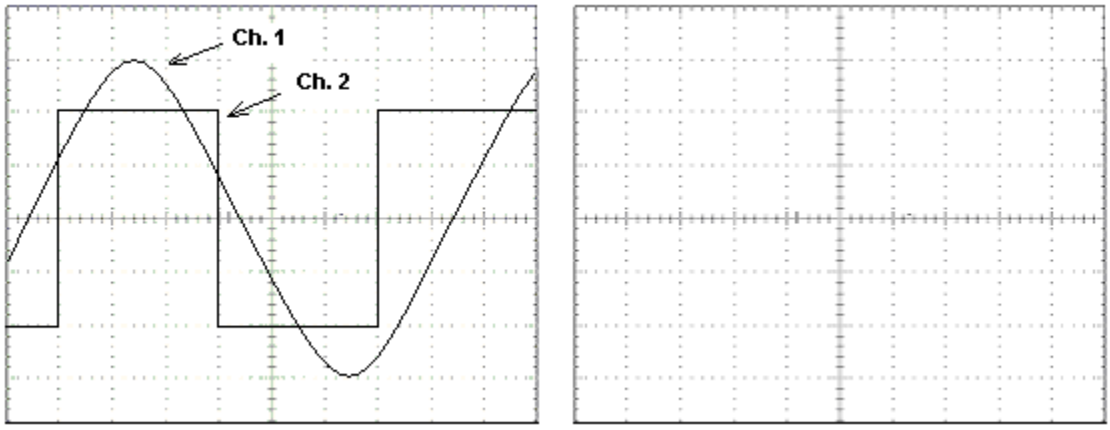
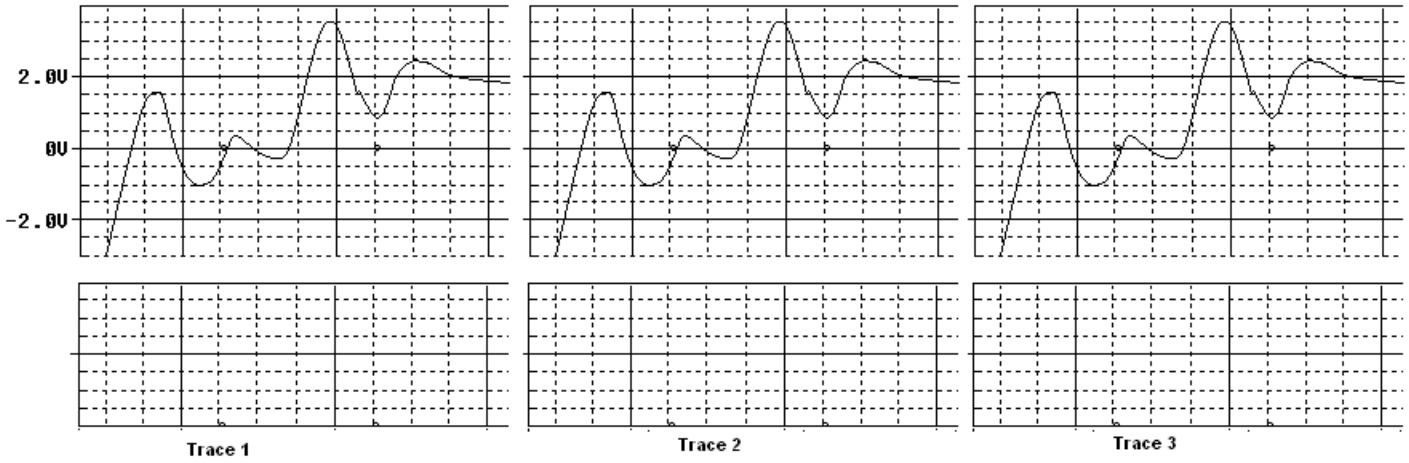
EE 211 Example Finals Questions

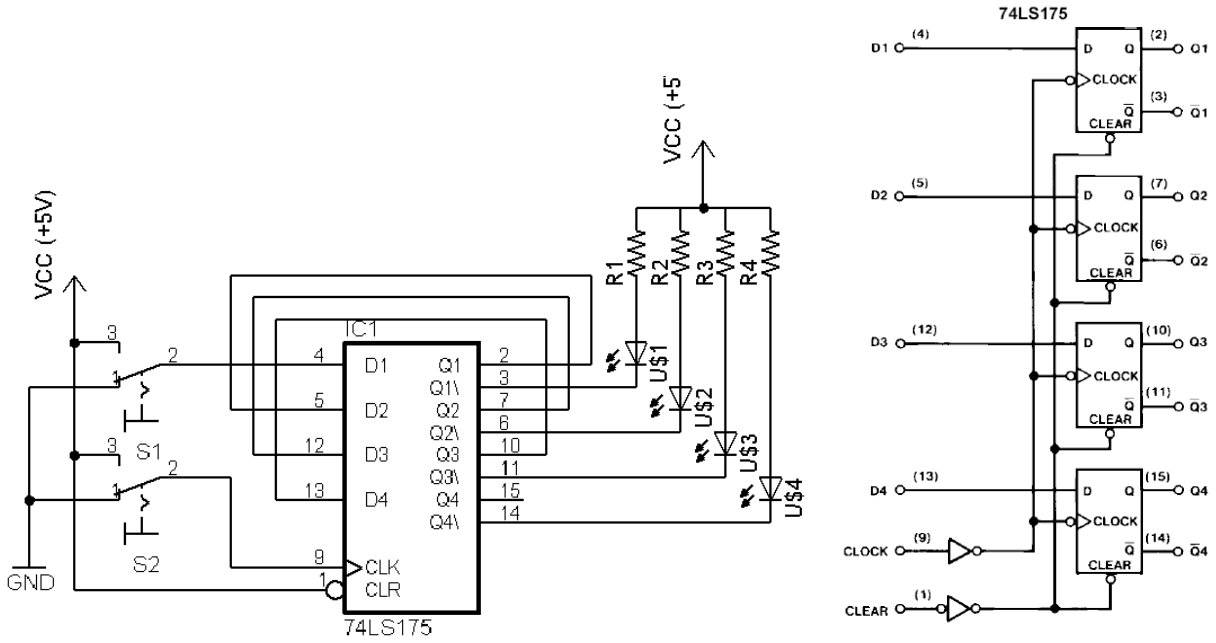


1. For the trace above, original scope settings are: time base 1 usec/div, vertical scale 1V/div, center line is at 0V, triggering from Ch.1 at the level of -0.8V, positive slope. Redraw the traces in the provided space, given that triggering is switched to Ch.2.



The following questions refer to the trace shown above:

2. On the line labeled Trace 1, show the output waveform for an op amp comparator circuit
3. For Trace 3, draw the output waveform for an op amp circuit with a linear gain of –0.5.



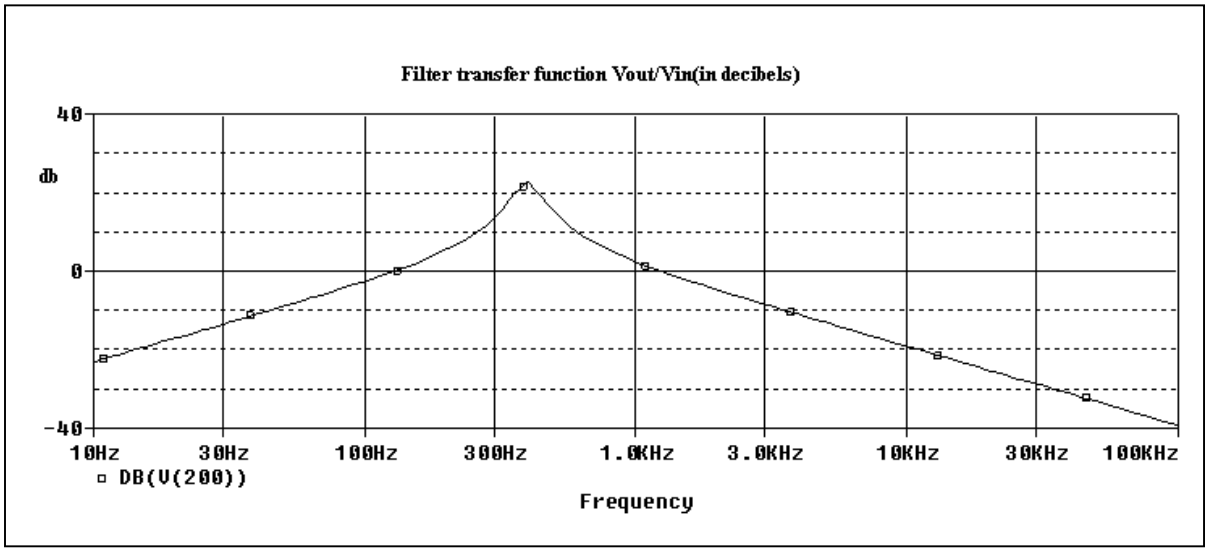
The circuit above is exactly the same as you had in "Sequential circuits" lab. To remind you of the functionality provided by the TTL chip 74LS175, its logic diagram is given on the right.

4. What is the function of this circuit?

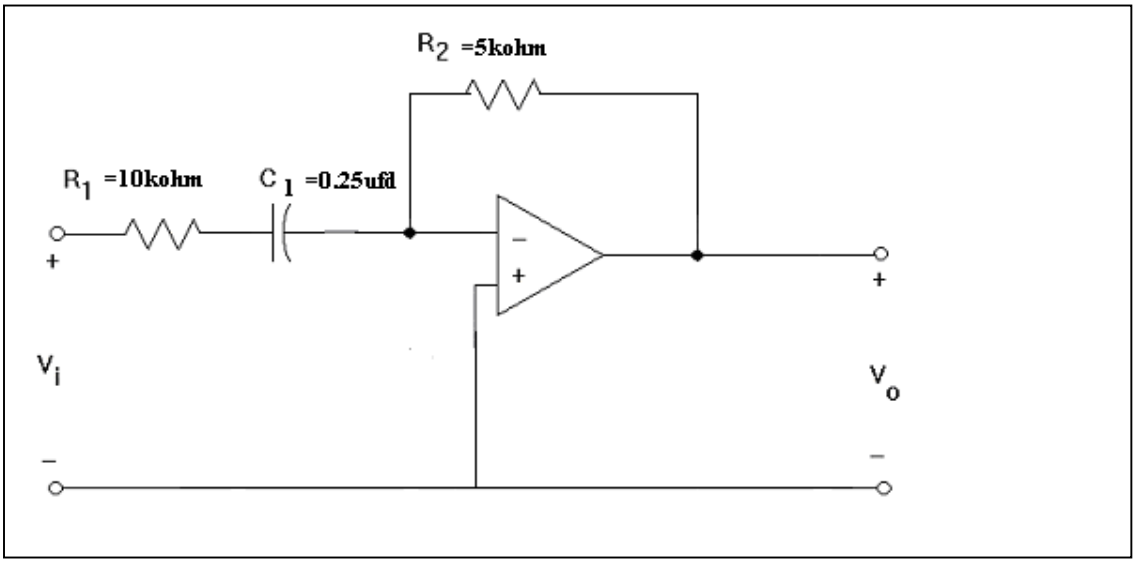
5. What is the purpose of switch S1?

6. What is the purpose of switch S2?

Frequency response:



7. On the graph, mark the upper and lower 3db points, and determine the bandwidth of the filter.

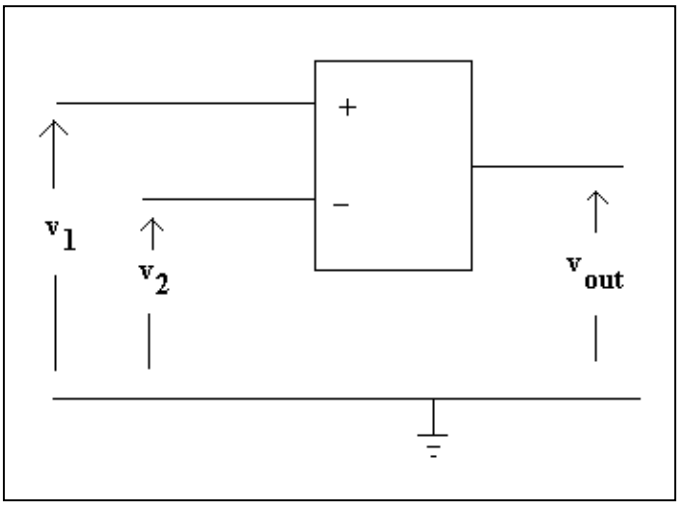


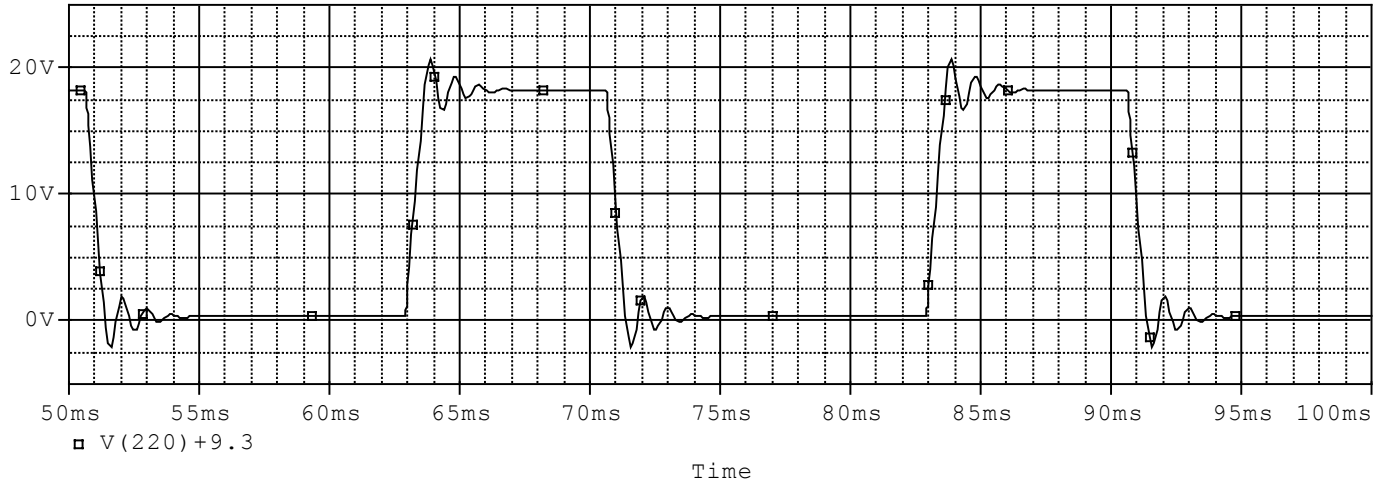
The following questions refer to the op amp circuit shown above:

8. R1 and C1 form the input impedance for this amplifier. Determine the input impedance in ohms at a frequency of 500 hertz.

The following questions refer to the amplifier circuit shown at right

18. At a given instant, $v_1 = 6$ volts and $v_2 = 3$ volts. Determine the common mode input voltage _____, and the differential mode input voltage_____





The following question refers to the trace shown above. Where appropriate, show your measurement points on the trace.

20. Determine the period of the wave:_____

21. In the sampling lab,we used the shift registers to remember the previous 5 samples of data. We then took the average of the 6 samples, consisting of the present sample plus the previous 5 samples. Explain how this algorithm responded to a sinusoidal signal of varying frequency.

22. In the circuit at right, Vs is a 400 hertz, 100 volt (rms) sine wave, Rx = 10 ohms and Lx=2 millihenries. Calculate the current and power flowing from the source.

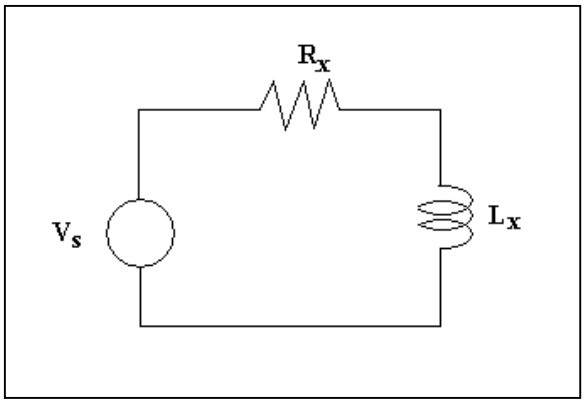


Table 4. Three input truth table

A	B	C	Y
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	0

23. Draw a logic diagram which implements the truth table shown above (Table 4).

36. In the graph below, draw a 5 volt, 2000 hertz pulse train with 50% duty cycle. Label both axes as appropriate.