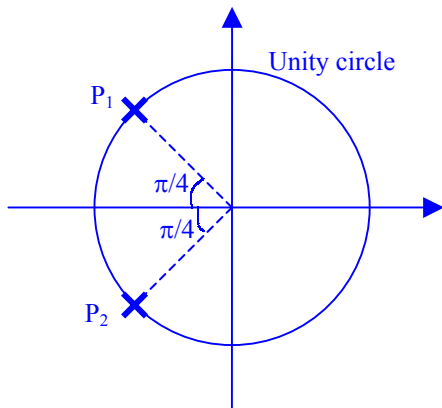


Subject: Homework #1
 Course: EEE598D: Analog Filter & Signal Processing Circuits
 Due Date: January 29, 2002 (at the end of class)
 From: Dr. Hongjiang Song

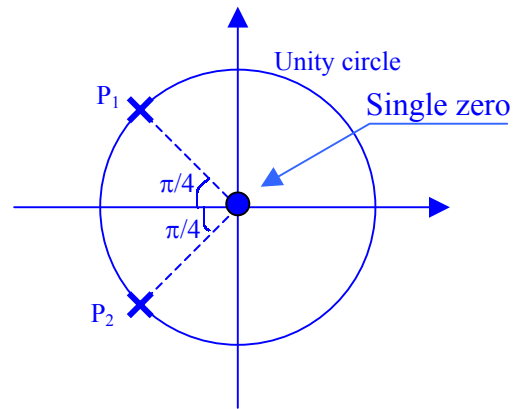
Problem 1:

For the following filters with s-domain pole/zero location shown in the diagrams, (i) find the transfer function of the filters, (ii) sketch the gain and phase responses of the filters.



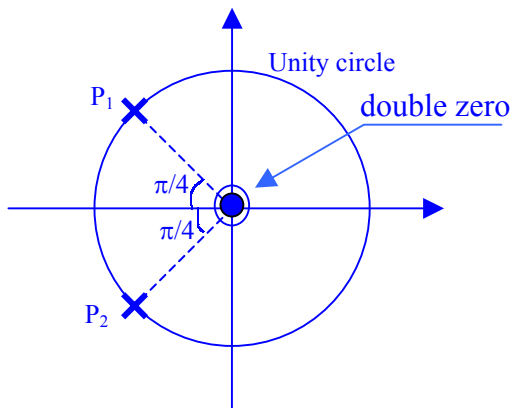
(A)

(Assuming $|H(j\omega)|_{\omega=0} = 1$)



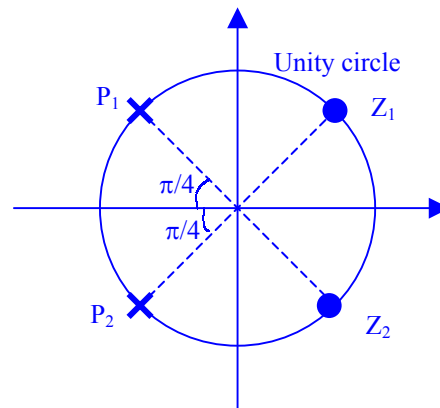
(B)

(Assuming $|H(j\omega)|_{\omega=1} = 1$)



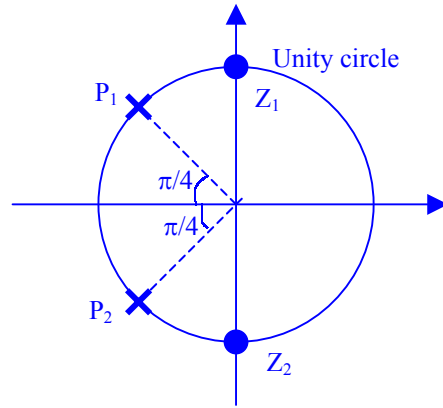
(C)

(Assuming $|H(j\omega)|_{\omega=1} = 1$)



(D)

(Assuming $|H(j\omega)|_{\omega=0} = 1$)

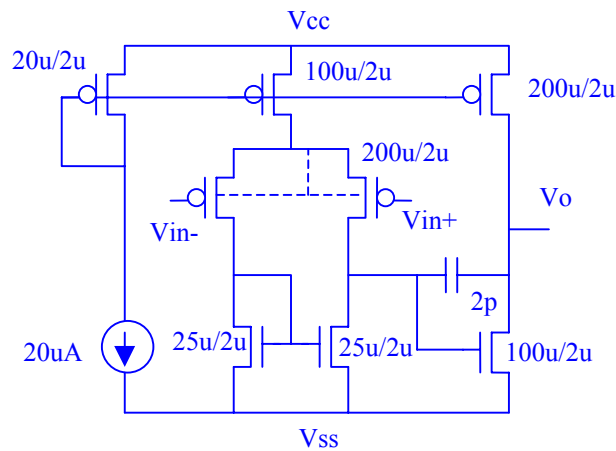
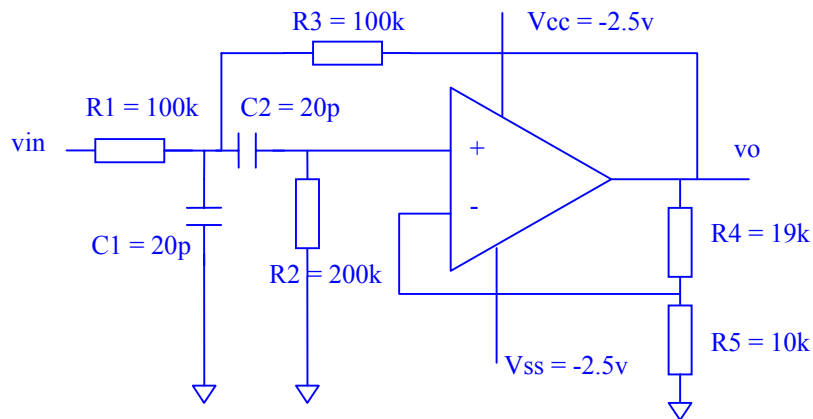


(E)

(Assuming $|H(j\omega)|_{\omega=0} = 1$)

Problem 2.

A practical VLSI active RC filter is shown in figure below. Derive the s-domain transfer function and simulate the ac responses (gain and phase) of the filter using a circuit simulate (spice/pspice/hspice or other.) with the operation amplifier provided.



Note: A version of spice can be downloaded from <http://www.winspice.com/>

Use 0.5um MOS device model from:

<http://www.mosis.org/cgi-bin/cgiwrap/umosis/swp/params/ami-c5n/t19l-params.txt>