Quiz #2

Problem 1 (3)

Sketch the magnitude Bode plot for each of following pole-zero diagrams.

(a)(1)   (b)(2)   (c)(3)
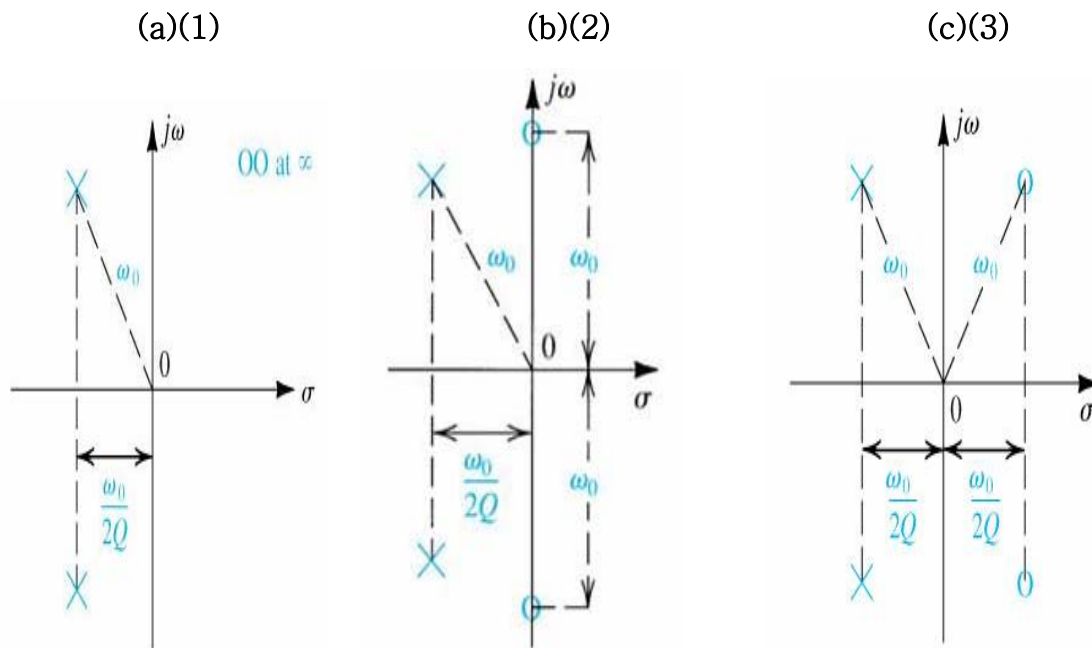
Problem 2 (7)

We want to design a band-pass filter having f_o = 1MHz and 3-dB bandwidth of 100KHz using a RLC circuit.

(a)(1) Draw a RLC circuit configuration for the band-pass filter.

(b)(1) Determine C if we want to use L = 1μH.

(c)(2) Determine R.

(d)(3) Design an identical BP filter using Tow-Thomas biquad shown below with C=100pF. Determine values for C_1, R, R_1, R_2, and R_3.
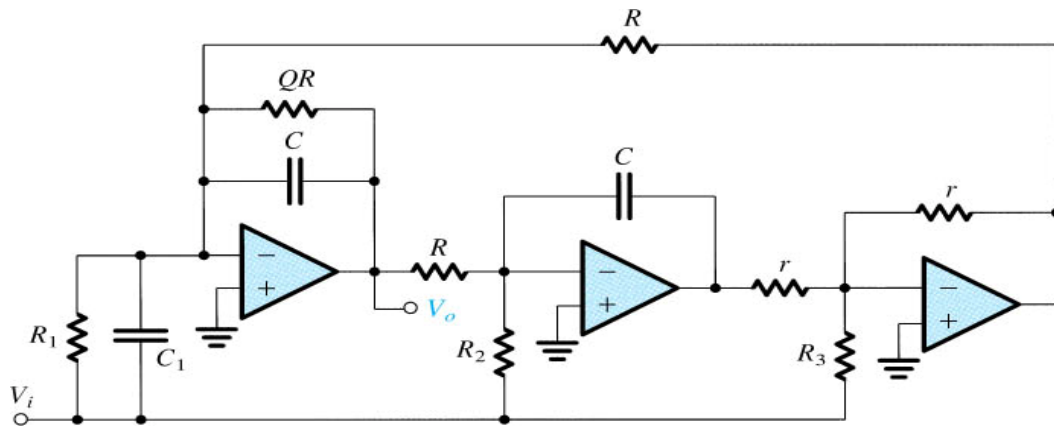
$$\frac{V_o}{V_i} = -\frac{s^2\left(\dfrac{C_1}{C}\right) + s\dfrac{1}{C}\left(\dfrac{1}{R_1} - \dfrac{r}{RR_3}\right) + \dfrac{1}{C^2 RR_2}}{s^2 + s\dfrac{1}{QCR} + \dfrac{1}{C^2 R^2}}$$