COLLEGE OF ENGINEERING & TECHNOLOGY

Department: Electronics and Communications

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Course : Analog Signal Processing

Course Code: EC434

Problem Set 3

P1. For Figure 1 shown if $R_1=R_2=R_3=15k\Omega$, $C_1= C_2=C_3 1nF$, determine:

a. The transfer function H(s)
b. The type of filter
c. The overall roll-off of the filter and plot its magnitude response
d. If $R_1=15k$, $R_2= 10k$, $R3=5k\Omega$ and $C_1= C_2=C_3 1nF$, plot the resulting magnitude response.

What is the purpose of the operational amplifier?

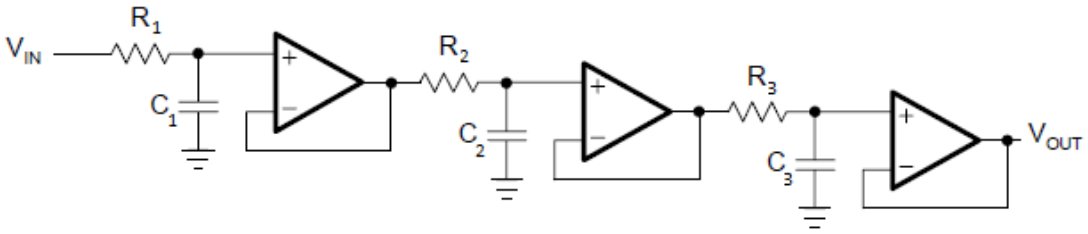


Fig.1

P2. The asymptotic magnitude voltage transfer function for a band-pass filter is shown below in Figure 2.

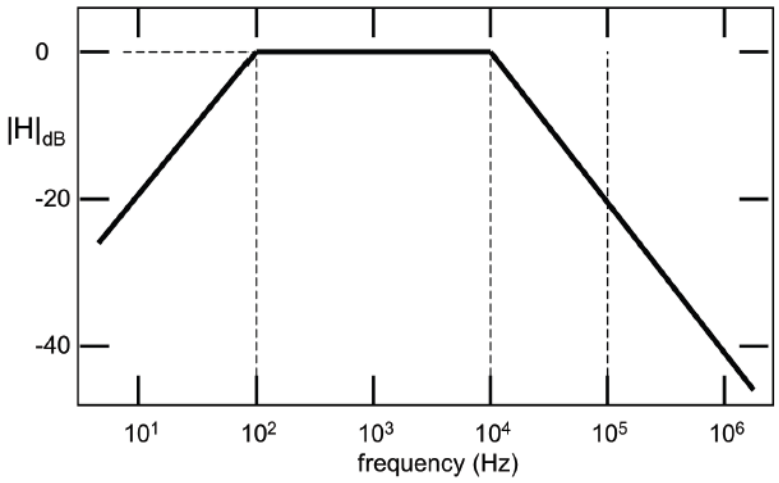
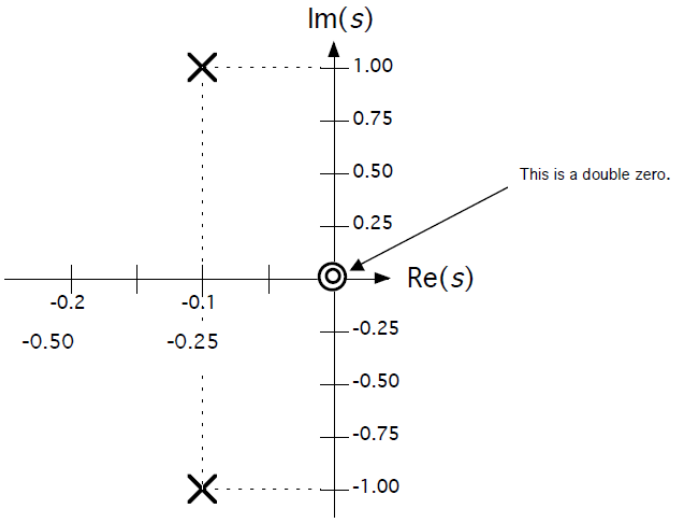


Fig.2

a. Get the transfer function H(s) of this system.
b. Determine the type of filter.
c. Design an R-C filter that achieves this frequency response.
d. Modify your design for K=3 and sketch its corresponding frequency response.

P3. Using the pole-zero plot given in fig. ,find:

a. The transfer function of the system
b. The filter type.



P4. For a unity gain Sallen and Key Low Pass Filter:

a. Determine the relationship among the component's values for Q=0.5. Design such filter for w=100kr/s.
b. If R1=R2, determine the relationship among the capacitor's values that yields to $Q = \frac{1}{\sqrt{2}}$. Design such filter for f=1kHz..