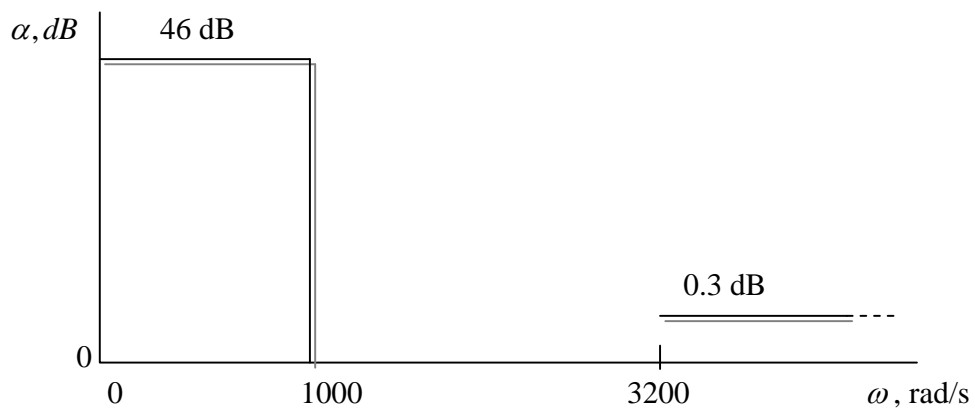


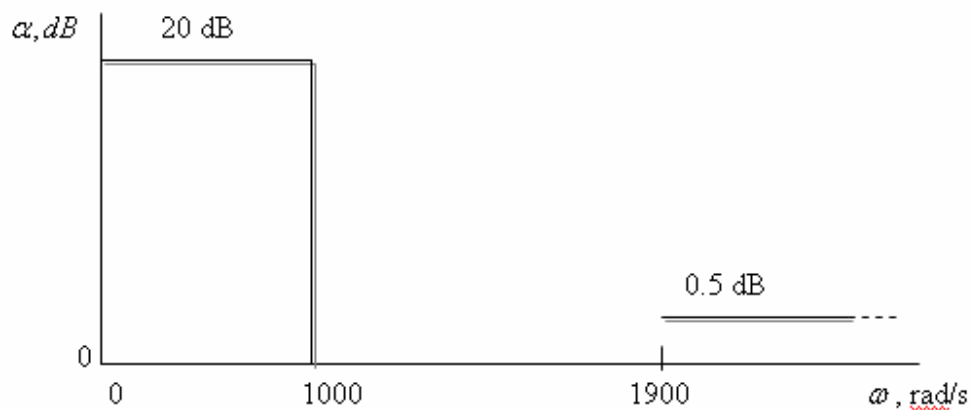
Electrical Engineering Department
EE-416 Analog Filter Design
Instructor: Dr. Hussain Alzaher
H.W.# 3
Due Saturday, Nov .25, 2006

1) Design a highpass filter with a maximally flat response to meet the attenuation specification given. Determine the attenuation your filter realizes at the two frequencies $\omega = 1.2 \text{ krad/s}$ and $\omega = 800 \text{ rad/s}$.

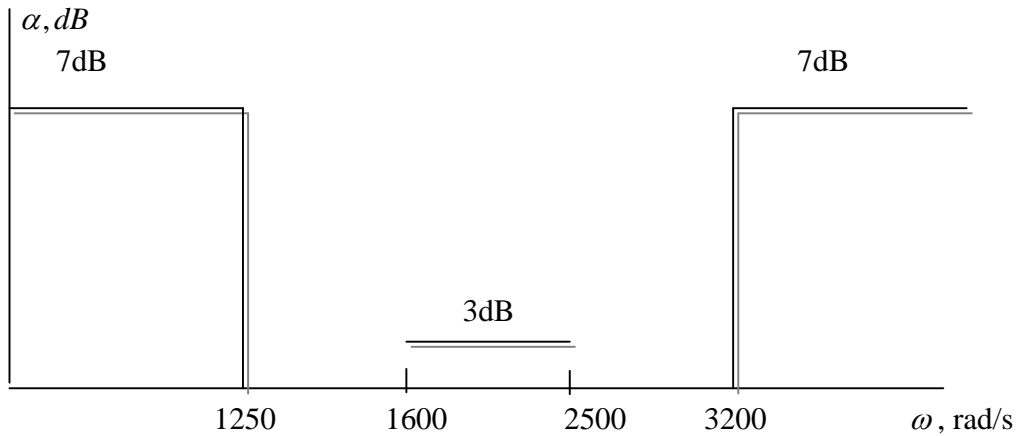


2) A highpass filter with a Chebyshev passband is required. The specifications are as shown.

- (a) Find the transfer function of the required filter.
- (b) Determine the loss actually realized by your design at $\omega = 1100 \text{ rad/s}$ and $\omega = 900 \text{ rad/s}$.



3) Design a bandpass filter to meet the specifications shown, with the added requirement that the response be Butterworth. It is required that $\alpha(2000) = 0\text{dB}$.



4) Design a bandstop filter with a maximally flat magnitude response having the frequency characteristic shown. Calculate the attenuation your design actually achieves at $f = 800\text{Hz}$ and $f = 850\text{Hz}$. Use magnitude scaling so that element values are in practical range. If possible use all identical capacitors and no more than four opamps (a "quad"). Test your design.

