

HOMWORK 5

ECE 580

Due November 20, 2023

The specifications of a low-pass filter are as follows:

- passband edge $f_p = 20$ kHz,
- stopband edge $f_s = 60$ kHz,
- passband gain ripple 0.1 dB,
- maximum stopband gain -50 dB.

What is the lowest order for the filter if it is

1. Butterworth filter
2. Chebyshev filter
3. Elliptic filter

Show the pole and zero patterns for all filters.