20CYS111 – Digital Signal Processing
Assignment 3
Due Date : 29th June 2022

1. Design a linear phase high pass filter whose desired frequency response

$$H_d(e^{j\omega}) = \begin{cases} e^{-j\omega\alpha} & for \ \pi/4 \ \leq \ |\omega| \ \leq 3\pi/4 \\ 0 & Otherwise \end{cases}$$

using hanning window for N=9. Determine the filter coefficients and magnitude response.

2. Design an ideal Band Pass Filter whose desired frequency response

$$H_d(e^{j\omega}) = \begin{cases} 1 & for \ \pi/4 \ \leq \ |\omega| \ \leq \pi/2 \\ 0 & Otherwise \end{cases}$$

Using Hamming window for N=7. Determine the filter coefficients of causal FIR filter and magnitude response.

3. Design an ideal Band Stop Filter whose desired frequency response

$$H_d(e^{j\omega}) = \begin{cases} 1 & for \ \pi/4 \ \leq \ |\omega| \ \leq \pi/2 \\ 0 & Otherwise \end{cases}$$

Using rectangular window for N=5. Determine the filter coefficients of causal FIR filter and magnitude response

4. Design an ideal low Pass Filter whose desired frequency response

$$H_d(e^{j\omega}) = \begin{cases} 1 & for \ \pi \ \leq \ |\omega| \ \leq \pi/2 \\ 0 & Otherwise \end{cases}$$

Using Hanning window for N= 9. Determine the filter coefficients of causal FIR filter and magnitude response.