Assignment 4

BRI 509 Introduction to Brain Signal Processing

Due date : 2021.6.21

Name : _____

Studendt ID # : _____

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1. Explain the following terms briefly. (1 point)

(a) Sampling Theorem

(b) Anti-aliasing

(c) Band limited signal

(d) distortion

(e) causal filter

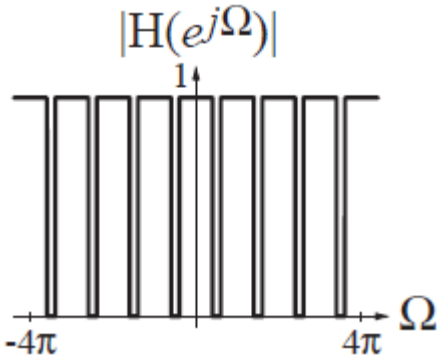
(f) Linear phase

2. Solve the following problems. (1 points)

(a) Draw a cascade-form block diagram for the system transfer function.

$$H(z) = \frac{z}{(z+1/3)(z-3/4)}$$

(b) Classify the frequency responses in the figure as being lowpass, highpass or bandstop



(c) Calculate the filter responses of the following FIR filter.

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$$h_N[n] = \sum_{m=0}^{N-1} a_m \delta[n-m]$$

where $N = 3$, $a_0 = 0.25$, $a_1 = 0.5$, $a_2 = 0.25$

1. Impulse response

2. Excitation : {..., 0, 0, 8, 8, 8, 0, 0, ...}

3. MATLAB coding. (3 points)

Design the FIR filters to separate do, mi, sol from do-mi-sol chord, respectively.

- Source code
- Filter coefficients for do, mi, sol, respectively
- Plot the Bode diagram of the designed filter
- Attach the Output MP3 files of the designed filters

<Thank you!!>