DSA-Assignment-4

Deadline: 23rd February 2025

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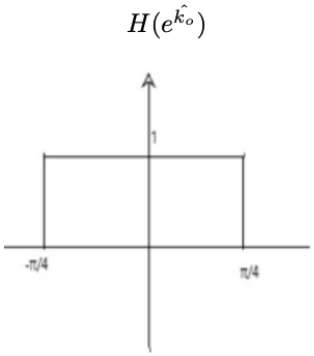
1. Solve all the question and submit a handwritten document
2. Plagiarism will be penalised
3. Submit a pdf of the form <**roll_no**>_**dsa4.pdf**

FIR Filter Design

1. Design the below filter using:

(a) without window (N = 11)
(b) with Hamming window (N = 9)



FIR Realization

2. Draw the Direct Form I (DF-I) and Direct Form II (DF-II) realizations of the digital system given by:

$$y(n) = 0.5y(n-1) - 0.3y(n-2) + x(n) - 0.7x(n-1)$$

3. Consider an IIR filter with the given transfer function. Draw its cascade form block diagram.

$$H(z) = \frac{(1 - 0.5z^{-1})(1 + 0.8z^{-1})}{(1 - 0.7z^{-1} + 0.3z^{-2})(1 + 0.6z^{-1} - 0.2z^{-2})}$$

Speech Production

4. Record your name in Wavesurfer software and observe different sounds. Submit spectrogram, formants, and other plot figures obtained using Wavesurfer.