

Assignment 2 (Dr. Siddhant Singh)
Subject: Digital Signal Processing
Class: B.Tech (ECE) 5th Semester

Q 1. Find the linear and circular convolution of following sequences.

$$x(n) = \{4, -3, 2, 1\}$$

$$y(n) = \{1, 0, 2\}$$

Q 2. Calculate the DFT of a sequence $x(n) = \{1, 1, 0, 0\}$ and check the validity of your answer by calculating its IDFT.

Q 3. Determine the DFT of the sequence

$$h(n) = \begin{cases} \frac{1}{2}, & -2 \leq n \leq 2 \\ 0, & \text{otherwise} \end{cases}$$

Plot the magnitude and phase response for $N=8$.

Q 4. The first five points of the 8-point DFT of a real valued sequence are $\{0.25, 0.125 - j0.3018, 0, 0.125 - j0.0518, 0\}$.

Determine remaining three points.

Q 5. Draw the stage wise flow graph for radix-2 decimation in frequency FFT algorithm for $N=8$.

Q 6. Write short notes on the following:

(i) Butterfly computation, (ii) Inplace computations.