COURSE NAME: Digital Signal Processing

COURSE CODE: PCEC-111

Assignment-2 (only for Section A1)

Date of Submission: 08.11.2024

Q1.

a. Find the Z-Transform and plot the ROC of

$$x(n) = 2\left(\frac{5}{6}\right)^{n} u(-n-1) + 3\left(\frac{1}{2}\right)^{2n} u(n)$$

b. Solve the following difference equation

$$y(n) + 2y(n-1) = x(n)$$

with $x(n) = (1/3)^n\, u(n)$ and the initial condition $y(-1) = 1$.

Q2.

a. Compute the 8-point DFT of the sequence

x(n) = {1, 0, 0, 0, 0, 0}

i. directly
ii. FFT

b. In an LTI system, the input x(n) = {2, 2, 2} and the impulse response h(n) = {–2, –2}. Determine the response of LTI system by Radix-2 DIT FFT.