

COURSE NAME: Digital Signal Processing

COURSE CODE: PCEC-111

Assignment-2 (only for Section B2)

Date of Submission: 08.11.2024

Q1.

a. State and prove Initial Value theorem and Final value theorem in Z-transform.

b. Find the Z-transform and plot the ROC of $x(n) = n^2u(n)$

Q2.

a. Determine the response of the system characterized by impulse response

$h(n) = (0.5)^n u(n)$ to input signals.

i. $x(n) = 2^n u(n)$

ii. $x(n) = u(-n)$

b. Use the residue method to obtain $x(n)$ from:

$$X(z) = \frac{z(z+1)}{(z-1)^2}$$