Classwork 23
FA24
UAH
CPE 381
Instructor: Rahul Bhadani

Name of the Student:

11/18/2024

Total Marks: 10 points

(1) Transfer function to difference equation:

Given the transfer function $H(z) = \frac{1+z^{-1}}{2(1-z^{-1})}$ write down equivalent difference equation assuming input as $x[n]$ and the output as $y[n]$. Assume all initial conditions to be zero, and the system to be causal.

(5 points)

Hint: Use time-shift property of z-transform.

(2) Find the inverse z-bans form, i.e $x[n]$ for different values of n :

$$X(z) = \frac{z}{2z^2 - 3z + 1}, \quad |z| < \frac{1}{2}$$

Note: You'll not get a closed form solution. (5 points)

First, based on ROC: $\{|z| < \frac{1}{2}\}$, tell me if it is a left handed sequence or a right handed sequence.

Second, you need to use long division method to find $x[n]$ for different values n.

You must write down the definition of z-bansform first.