DSP Practice Test #1-A

Name: _____ Start Time: _____

Problem 1:

Let $y[n] = \begin{cases} 0, & n < 0 \\ \sum_{i=0}^{n} x[i], & n \geq 0 \end{cases}$

A) Is the system linear? Explain

B) Is the system causal? Explain

C) Is the system stable? Explain.

D) Is the system shift-invariant? Explain.

Problem 2:

A system is completely characterize by its impulse response $h[n] = e^{-3n}u[n+1]$

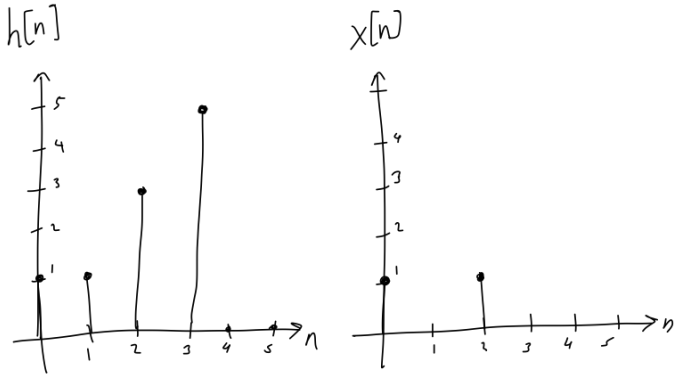
A) Is the system linear? Explain

B) Is the system causal? Explain

C) Is the system stable? Explain.

D) Is the system shift-invariant? Explain.

Problem 3:



Let: $h[n] = \delta[n] + \delta[n-1] + 2\delta[n-2] + 3\delta[n-3]$ $x[n] = \delta[n] + \delta[n-2]$

A) Find $x[n] * h[n]$

B) Find the DTFT of $h[n]$

Problem 4:

Given the causal system represented by the following difference equation:

$$y[n] = \frac{7}{10}y[n-1] - \frac{1}{10}y[n-2] + x[n] + x[n-1]$$

A) Determine the frequency response, $H(\omega)$

B) Determine the impulse response, $h[n]$, of the system in found in the previous part.