DIGITAL SIGNAL PROCESSING

TUTORIAL No. 9: Realization and Frequency Response

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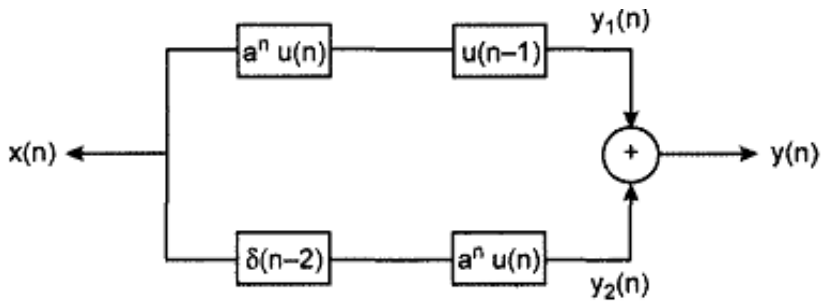
Question 1:

The impulse response is given by $H(z)=\frac{3-7z^{-1}+5z^{-2}}{1-2.5z^{-1}+z^{-2}}$. Suppose x[n], the input to the system,

a. Find all available impulse responses in the time domain h[n] with their ROCs and stabilities.
b. Discuss about the causality and stability properties of the results in (a)
c. Sketch the zeros and pole pattern in the Z-plane of the above system then sketch the frequency response of the system.
d. Realize the block diagram of the system in Direct Form I and Direct form II (Canonical Form)

Question 2:

Find the overall impulse response of following system?



Question 3:

A digital reverberation processor has frequency response:

$$H(\omega)=\frac{-0.5+e^{-j\omega 8}}{1-0.5e^{-j\omega 8}}$$

where ω is the digital frequency in [radians/sample].

a. Determine the causal impulse response h(n), for all n>=0 and sketch it versus n.
b. Find zeros and poles of the system.
c. Sketch frequency response of the system
d. Realized the block diagram for the system.