Serial # 0

-1 point for not writing your serial #

King Fahd University of Petroleum & Minerals
Electrical Engineering Department
EE207: Signals & Systems (121)
Quiz 7: Discrete-Time LTI Systems
Dr. Ali Hussein Muqaibel

Name: KEY

1. Consider an LTI system with input and output related by $y[n] = 2x[n+1] + 3x[n]$

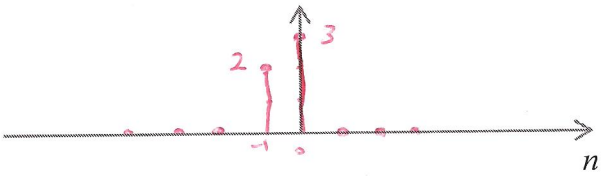
a. Is the system causal or not? Justify your answer

non causal Because current output depends on future input

b. Find and sketch the systems impulse response $h[n]$.

$y[n] \rightarrow h[n]$ $\quad x[n] \leftarrow \delta[n]$

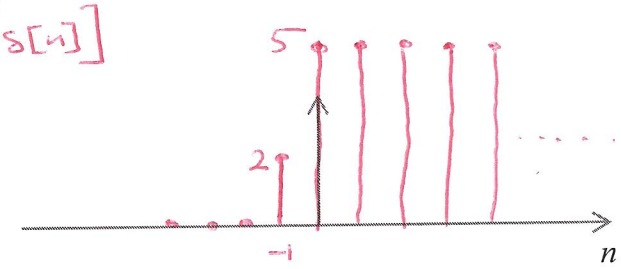
$h[n] = 2\delta[n+1] + 3\delta[n]$



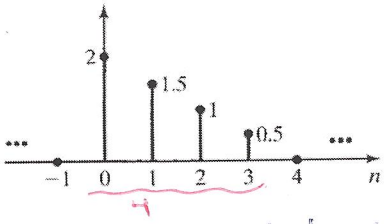
c. Find and sketch the system step response $s[n]$

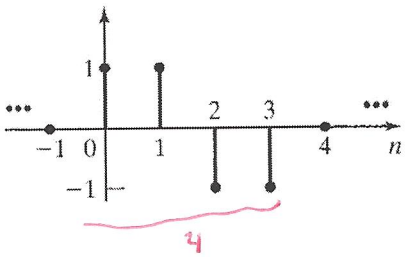
$$s[n] = \sum_{k=-\infty}^{n} h[n] = \sum_{k=-\infty}^{n} [2\delta[n+1] + 3\delta[n]]$$

$$s[n] = \begin{cases} 0 & n < -1 \\ 2 & n = -1 \\ 5 & n \geq 0 \end{cases}$$



2. A system having and impulse response $h[n]$ is excited with a signal $x[n]$. Find and sketch the output $y[n]$ for all values of n .





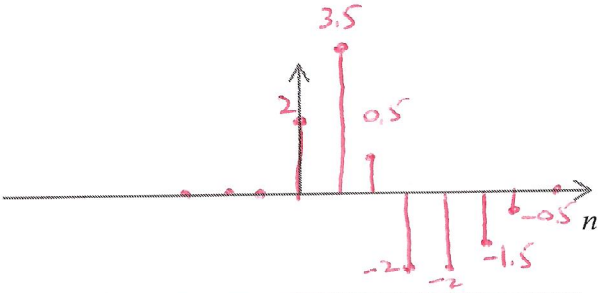
4

			2	1.5	1	0.5	
-1	-1	1	1				2
	-1	-1	1	1			3.5
		-1	-1	1	1		0.5
			-1	-1	1	1	-2
				-1	-1	1	-2
					-1	-1	-1.5
						-1	-0.5

0

# of spans

4+4-1 = 7



Good luck, Dr. Ali Muqaibel