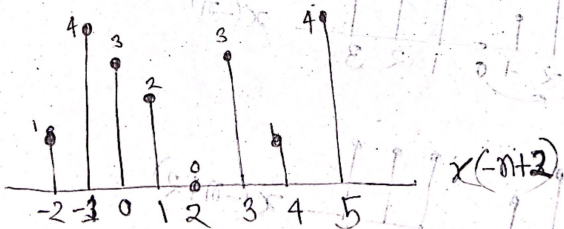
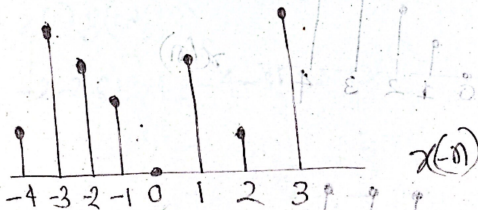
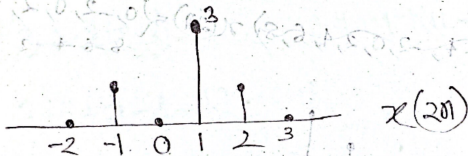
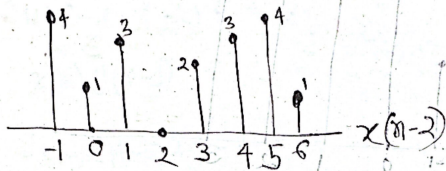
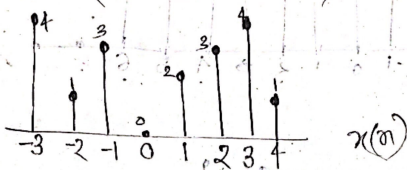


**CSE 431, TT#2, Time: 30 min, Marks: 20**

1. A DT signal  $x(n) = \{4, \underline{1}, 3, \underline{0}, 2, \underline{3}, 4, \underline{1}\}$  is given. Sketch  $x(n-2)$ ,  $x(-n+2)$ , and  $x(2n)$ .
2. Determine if the following systems are causal or non-causal.  
a)  $y(n) = x(n) - x(n-1)$     b)  $y(n) = x(2n)$     c)  $y(n) = y(-n)$ .
3. Determine the range of values of the parameter  $a$  for which the LTI system with impulse response  $h(n) = a^n u(n)$  is stable.
4. Find the convolution of the sequences  $x(n) = [1, 1, -1]$  and  $y(n) = [1, 2, 3]$ .
5. Sketch the block-diagram representation of the discrete-time system described the input-output relation  $y(n) = 0.25y(n-1) + 0.5x(n) + 0.5x(n-1)$ , where  $x(n)$  is the input and  $y(n)$  is the output.

# Tutorial - 2

④ Given,  $x(n] = \langle 4, 1, 3, 0, 2, 3, 4, 1 \rangle$



2/ Ans:

Causal

$$y(n] = x(n] - x(n-1]$$

Non-Causal

$$y(n] = x(2n]$$

$$y(n] = x(-n]$$

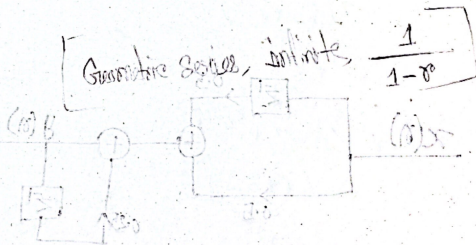
3/ Given,  $h(n] = a^n U(n]$

$$y(n] = x(n] * h(n] = x(n] * a^n U(n] = x(n] * a^n \cdot 1 = x(n] \cdot a^n$$

$$= U(n] * h(n]$$

$$= \sum_{k=0}^{\infty} a^k$$

$$= \frac{1}{1-a}$$



4

Answer - 10/11

$$(1-z^{-1})x = (1-z^{-1})y$$

$$(1-z^{-1})x = (1-z^{-1})y$$

$$(1-z^{-1})x = (1-z^{-1})y$$

5 Ans:

$$y(n] = 0.25 y[n-1] + 0.5 x[n] + 0.5 x[n-1]$$

