GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Sixth Semester Regular) Examinations, May – 2024

21BCSPE36001 – Introduction to Digital Signal Processing

(CSE)

Time: 3 hrs Maximum: 70 Marks

(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. Find the value of x(n)= 4u(n-3)-u(n+4).	CO1	K2
b. Differentiate between symmetric and anti-symmetric signals.	CO1	K1
c. What is one-sided z-transform and it's RoC?	CO4	K1
d. What is a causal system? Give an example.	CO3	K1
e. Write down the condition for stability of a LTI system.	CO2	K1

PART – B **(15 x 4 = 60 Marks)**

Answer ***ALL*** questions	Marks	CO #	Blooms Level
2. a. Determine whether the unit step signal is Energy signal or Power Signal.	8	CO1	K2
b. Check whether the system is linear or nonlinear if y(n)=Ax(n)+B.	7	CO2	K2
(OR)			
c. Find the Even and Odd component of x(n) = {1, -1,2, -2,5}.	7	CO1	K2
d. Check whether the system is stable or unstable if $h(n)=\left(\frac{1}{2}\right)^n u(n)$	8	CO2	K2
3.a. Find the linear convolution of x(n) = {1,-2,3,-4} and h(n) = {2,-5,3,7,6,-1} using time domain formula.	15	CO3	K2
(OR)			
b. Perform the cross correlation between x(n) = {-1,1,3, -4} and h(n) = {2,-1,-2,0,5}	15	CO3	K2
4.a. Prove the convolution property of Z-transform.	7	CO4	K1
b. Find the z-transform of **$x(n)= na^{n-1}u(n)$**.	8	CO4	K2
(OR)			
c. Check Whether the given system is causal and stable. y (n) = 4 x (n-3) + 7 x (n + 3)	7	CO2	K2
d. Test whether the system is time variant or not: $y(n) = 2x(-n)$.	8	CO4	K2
5.a. Find the inverse z-transform of $X(Z)=\frac{1}{1-0.8z^{-1}+0.12z^{-2}}$ When i) RoC:$\lvert z\rvert > 0.6$ ii) RoC:$\lvert z\rvert < 0.2$ iii) RoC:$0.2 < \lvert z\rvert < 0.6$	15	CO4	K2
(OR)			
b. Draw the block diagram of y(n) = 3y(n-1) +5 y(n-2) + x(n) -3x(n-1)	6	CO2	K2
c. Find the homogeneous solution of y(n)+y(n-1)-2y(n-2)=x(n-1)+2x(n-2)	9	CO3	K2

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