GIET UNIVERSITY, GUNUPUR – 765022

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

21BECPC24004 – Signals and Systems

(ECE)

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. What are the representation of discrete time signal?	CO1	K1
b. Prove that Auto correlation is an Even function.	CO2	K2
c. Define Fourier transform of the signal x(n).	CO3	K2
d. Write down the time delay property of Z-transform.	CO4	K1
e. Represent x(n) in sequential form if x(n)=2δ(n-1)-δ(n)+2δ(n+2)-3δ(n-4)+δ(n-3)	CO2	K2

PART – B **(15 x 4 = 60 Marks)**

Answer ***ALL*** questions	Marks	CO #	Blooms Level
2. a. Determine if the following systems are time-invariant, linear, causal, and static? (i) y(n)=x(n+1) (ii) y(n)=n x(2n)	15	CO1	K4
(OR)			
b. Draw the block diagram of the discrete time system 3y(n)+3x(n)-4y(n-1)+4x(n-2)-4y(n-3)=3x(n-3)	10	CO1	K3
c. Check for stability if h(n)=$(\frac{1}{3})^n u(n)$	5	CO1	K4
3.a. Find the linear convolution if x(n)=$2^n u(n)$ & h(n)= $5^n u(n)$. Find 5 samples of output.	15	CO2	K5
(OR)			
b. Find the response of the system described by difference equation y(n)+2y(n-1)+y(n-2)=x(n)+x(n-1) for x(n)= $(\frac{1}{2})^n$u(n) with y(-1)=y(-2)=1	15	CO2	K5
4.a. Determine the Fourier series representation of x(n)={……1,2,3,4,1,2,3,4,↑1,2,3,4,1,2,3,4,1,2,3,4……..}	15	CO3	K4
(OR)			
b. Find X($e^{j\omega}$), if x(n)=$\frac{1}{5}[(\frac{1}{3})^n + (\frac{1}{7})^n)]u(n)$	8	CO3	K3
c. Find the Auto correlation of x(n)={1,2,3,4,5}	7	CO3	K4
5.a. Prove the Convolution property of Z-transform.	7	CO4	K3

b.	Find the Z-transform of x(n)=$n4^{n-2}u(n+2)$	8	CO4	K4
	(OR)			
c.	Find the inverse Z-transform using Long division method if X(Z)=$\frac{1}{1-1.5z^{-1}+0.5z^{-2}}$ i) RoC: IZI>1 ii) RoC: IZI<0.5	15	CO4	K4

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