R15

ANURAG Engineering College
(An Autonomous Institution)
II B.Tech II Semester Supplementary Examinations, June/July-2024
SIGNALS AND SYSTEMS
(ELECTRICAL AND COMMUNICATION ENGINEERING)

Time: 3 Hours | **Max. Marks: 75**

Section – A (Short Answer type questions) (25 Marks)
Answer All Questions

		Course Outcome	B.T Level	Marks
1.	What is orthogonal signal space?	CO1	L1	2M
2.	What is even symmetry? How it could be used in simplification.	CO1	L1	3M
3.	State the duality theorem of continuous FT	CO2	L1	2M
4.	What is aliasing? How it can be avoided?	CO2	L1	3M
5.	Define impulse response of a system	CO3	L1	2M
6.	Define system bandwidth and signal bandwidth	CO3	L1	3M
7.	State the frequency convolution theorem	CO4	L1	2M
8.	Give the relation between ESD and Autocorrelation function $R(\tau)$	CO4	L1	3M
9.	Find inverse Laplace transform of $1/((s+1)^2+1)$	CO5	L1	2M
10.	Find the Z-transform of $x(n) = n\delta(n-2)$	CO5	L1	3M

Section B (Essay Questions)
Answer all questions, each question carries equal marks. (5 X 10M = 50M)

			Course Outcome	B.T Level	Marks
11.	A)	Define the error function while approximating signals and hence derive the expression for condition for orthogonality between two waveforms $f_1(t)$ and $f_2(t)$.	CO1	L 2	10M
		OR			
	B)	Find the exponential Fourier series coefficient of the signal $x(t)= \sin 4\pi t + 2\cos 3\pi t$	CO1	L 2	10M
12.	A)	Find the Fourier transform of the signal $x(t) = 1/(a^2+t^2)$ and plot its magnitude spectrum	CO2	L 3	10M
		OR			
	B)	What is the effect of under sampling? Discuss different types of samplings	CO2	L2	10M
13.	A)	What is an LTI system? Explain its properties. Derive an expression for the transfer function of an LTI system	CO3	L 2	10M
		OR			
	B)	Derive the relationship between bandwidth and rise time	CO3	L 2	10M
14.	A)	Discuss the graphical representation of convolution with example.	CO4	L 2	10M
		OR			
	B)	Verify Parseval's theorem for the energy of the signal $x(t)=e^{-5t}u(t)$	CO4	L3	10M
15.	A)	Determine the Laplace Transform for the below signals and plot it's region of convergence. i) $x(t)= e^{4t}u(-t)+e^{-6t}u(t)$ ii) $te^{-at}u(t)$	CO5	L 3	10M
		OR			
	B)	Find the Z Transform of $x[n] = na^{n-1}u[n]$.	CO5	L 3	10M