R18

ANURAG Engineering College
(An Autonomous Institution)
### II B.Tech I Semester Supplementary Examinations, Jan/Feb-2024
SIGNALS AND SYSTEMS
(ELECTRONICS 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.	Differentiate between Vector and signal.	CO1	L1	2M
2.	Define the term orthogonality.	CO1	L2	3M
3.	List out the Properties of an Impulse function.	CO2	L2	2M
4.	What is the Fourier transform of DC signal with amplitude 1?	CO2	L1	3M
5.	State the Paley-Wiener criterion for physical reliability of the system.	CO3	L1	2M
6.	Write the conditions for distortion less transmission.	CO3	L2	3M
7.	State the Parse-Val's Theorem.	CO4	L2	2M
8.	Write the expression for cross correlation of Power signal.	CO4	L2	3M
9.	Mention the relationship between Laplace transform and Fourier transform.	CO5	L1	2M
10.	State the Time reversal property of z-transform.	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)	Discuss about Orthogonal Signal Space and obtain the expression for mean square error.	CO1	L3	10M
		OR			
	B)	Determine the Exponential Fourier series coefficient of the following waveform.	CO1	L3	10M
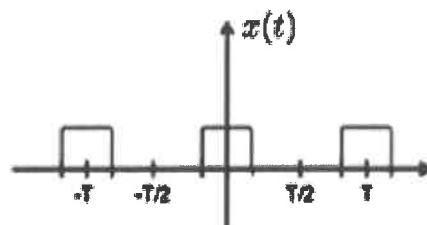
			Course Outcome	B.T Level	Marks
12.	A)	Obtain the Fourier transform of the following signals i) $4 \cos 2\omega_0 t$ ii) $e^{-4t} u(t)$	CO2	L3	10M
		OR			
	B)	State and prove sampling theorem for band-limited signals.	CO2	L3	10M
13.	A)	Explain about stability and causality of an LTI system.	CO3	L3	10M
		OR			
	B)	Explain the filter characteristics of ideal LPF, HPF and BPF using their magnitude and phase responses.	CO3	L3	10M
14.	A)	With an example explain how correlation can be used for the extraction of signal in the presence of noise.	CO4	L3	10M
		OR			
	B)	Derive the relationship between Autocorrelation function and Power spectral density function.	CO4	L3	10M

15. A) Determine the Laplace transform of the following two signals.   CO5   L3   10M
   i) $e^{-at} \sin(bt)u(t)$ ii) $x(t) = t\, e^{-at} u(t)$

OR

    B) State and prove any three z-transform properties.   CO5   L3   10M