



R18 Regulation

Subject code: 2P3DD

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech III Semester Supplementary Examinations, February 2024
SIGNALS AND SYSTEMS
(ECE)

Maximum Marks: 70

Date: 23.02.2024 Duration: 3 hours

- Note: 1. This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X2M=20 Marks)		CO	BTL
1	Define and Sketch Unit Step and Unit Impulse Signals.	CO1	L1
2	Define Fourier Series.	CO1	L1
3	Give the properties of a Fourier Transform.	CO2	L1
4	What is Hilbert Transform.	CO2	L1
5	Define Linear Time Invariant System(LTI).	CO3	L1
6	Write the characteristics of a Band Pass Filter.	CO3	L1
7	Give the convolution property of a Fourier Transforms.	CO4	L1
8	Define Energy Spectral Density (ESD) and Power Spectral Density(PSD).	CO4	L1
9	Differentiate Continuous Time Signals and Discrete Time Signals.	CO5	L1
10	Give the properties of Z-Transforms.	CO5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		M	CO	BTL
11	A. Write short notes on Orthogonal Signal Space. B. Compare Trigonometric Fourier Series and Exponential Fourier Series.	5M 5M	CO1	L2 L2
OR				
12	A. Write short notes on Mean Square Error. B. State Dirichlet's Conditions.	5M 5M	CO1	L2 L2
13	A. State and Prove Time shifting property of Fourier transform. B. Explain the process of deriving Fourier transform from Fourier series.	6M 4M	CO2	L3 L2
OR				
14	With the help of graphical representation analyze sampling theorem for low pass signals.	10M	CO2	L4
15	A. Explain the Filter characteristics of a Linear Systems. B. Explain the difference between Linear Time Variant (LTV) System and Linear Time Invariant (LTI) System.	5M 5M	CO3	L2 L2
OR				
16	Derive the relationship between rise time and bandwidth.	10M	CO3	L3

17	A. State and prove any two properties of a Correlation Function. B. Determine the power of a following signal $x(t) = (15 + 2 \sin 3t) \cos 10t$	5M 5M	CO4	L3 L2
	OR		CO4	
18	A. Derive the relation between Auto Correlation function & Energy/Power Spectral Density. B. Explain the extraction of a signal from noise by filtering	5M 5M		L3 L2
19	A. Define Laplace Transform and Region of Convergence. B Consider the following signals, find Laplace transform and region of convergence for signal $e^{-3t}u(t) + e^{-3t}u(t)$	5M 5M	CO5	L2 L3
	OR			
20	$y(n) = y(n-1) + y(n-2) + x(n-1)$. Apply Z transform, find H(z) and plot its ROC. Comment on stability	10M	CO5	L3