



R18 Regulation

Subject code:2E5BC

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, December 2024

DIGITAL SIGNAL PROCESSING

(EEE)

Maximum Marks: 70

Date:03.01.2025

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	Bloom Tx
1	What is an LTI system.	1	L1
2	Define the Z- transform	1	L1
3	Define discrete Fourier series.	2	L1
4	Explain linear convolution of two sequences.	2	L1
5	What is finite impulse response ?	3	L1
6	What are the characteristics of FIR digital filters?	3	L1
7	What is Gibbs phenomenon.	4	L1
8	Explain the procedure for designing FIR filters using window.	4	L1
9	What is multirate sampling .	5	L1
10	Define Dead band.	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		CO	Bloom Tx
11	a)Explain the block diagram of DSP and its applications. [5M] b)Define & Test for Linearity, Causality for the given systems described by i) $y(n)=n x(n)$ ii) $y(n)=x(-n)$ [5M]	1	L2
OR			
12	Find the z transform of the unit step and ramp and impulse signals and what is ROC and write the properties of ROC and also give relationship between s plane and z plane. [10M]	1	L2
13	a)Write any two properties of DFS. [5M] b) State and prove time shifting property of DFT. And What is zero padding? What are its uses? [5M]	2	L2
OR			
14	An 8-point sequence is given by $x(n)= \{1,2,1,2,1,2,1,2\}$ compute 8-point DFT of $x(n)$ RADIX-2 DIT-FFT algorithm [10M]	2	L2

15	Discuss IIR filter design using bi linear transformation and hence discuss frequency warping effect? [10M]	3	L2
	OR		
16	a)What are the advantages and dis advantages of FIR filters over IIR filters? [5M] b) write short notes on phase delay and group delay? [5M]	3	L2
17	Convert the following analog filter with transfer function $H_a(s) = (s+0.1) / ((s+0.1)^2 + 9)$ into digital IIR filter by using bilinear transformation in the digital IIR filter is having a resonant frequency $\omega_r = \pi/2$ [10M]	4	L2
	OR		
18	Compare IIR and FIR filters and write short note on window method [10M]	4	L2
19	What are the effects of finite word length in digital filters? [10M]	5	L2
	OR		
20	Explain in detail the decimation and interpolation. [10M]	5	L2