



R18 Regulation

Subject code:2E5BC

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, May 2025

**DIGITAL SIGNAL PROCESSING
(EEE)**

Maximum Marks: 70

Date: 24.06.2025

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.
 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)		Marks	CO	BTL
1	What are the properties of DTFT.?	2M	1	L1
2	Derive the relationship between Z-transform and DTFT.	2M	1	L1
3	What is zero padding method?	2M	2	L1
4	Obtain the convolution of the sequence $x(n)=\{1,2,3\}$, $h(n)=\{1,1,1\}$. by using any one method	2M	2	L1
5	What is meant by bilinear transformation technique.	2M	3	L1
6	Define Analog filters and Digital filters.	2M	3	L1
7	Write the differences between IIR and FIR digital filters.	2M	4	L1
8	What is Frequency sampling technique?	2M	4	L1
9	What is up-sampling?	2M	5	L1
10	Define Dead band.	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Explain block diagram of DSP and explain each and every component.	10M	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) Explain linear convolution of two sequences using DFT. b) Explain overlap save method.	5M 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	Explain the characteristics of FIR digital filter and also write short note on frequency response of FIR filters.	10M	3	L2

17	Explain window techniques.	10M	4	L2
	OR			
18	Compare FIR filters and IIR filters in briefly.	10M	4	L2
19	Draw the block diagram of multi stage decimator and interpolator.	10M	5	L2
	OR			
20	Discuss the effects due to finite word length in direct form -I and II structures.	10M	5	L2