



R18 Regulation

Subject code:2E5BC

# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, November 2025

## DIGITAL SIGNAL PROCESSING (EEE)

Maximum Marks: 70

Date: 10.11.2025

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	Explain linear convolution of two sequences.	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 properties of Chebyshev filter	2M	4	L1
8	Explain the procedure for designing FIR filters using window.	2M	4	L1
9	What is multirate sampling .	2M	5	L1
10	Define Decimation.	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 components .	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	Determine the 8 point DFT of the sequence $x(n)=\{1,1,1,1,1,1,0,0\}$ and also write the relation ship between DFT and Z transform	10M	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 the Design of FIR digital filter by using fourier series method	10M	4	L2
	OR			
18	Compare FIR filters and IIR filters in briefly	10M	4	L2
19	Explain the process of decimation using relevant expressions	10M	5	L2
	OR			
20	Explain up sampling and down sampling neatly	10M	5	L2