Question Paper Code: R18A32EC01

R18

ANURAG Engineering College

(An Autonomous Institution)

III B.Tech II Semester Supplementary Examinations, December-2024

DIGITAL SIGNAL PROCESSING

(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.	What are the applications of Z-Transforms?	CO1	L1	2M
2.	Test the system for time invariance a $^{x(n)}$	CO1	L1	3M
3.	How FFT is more efficient to determine DFT of sequence?	CO2	L2	2M
4.	Explain the significance of convolution	CO2	L1	3M
5.	What are the properties of chebyshev filter?	CO3	L1	2M
6.	What are the properties of the bilinear transformation?	CO3	L2	3M
7.	Draw the direct form realization of FIR system.	CO4	L2	2M
8.	What are the advantages of Kaiser widow?	CO4	L2	3M
9.	Define down sampling	CO5	L2	2M
10.	What are the Applications of Multi-rate Digital Signal Processing	CO5	L1	3M

Section B (Essay Questions)

Answer all questions, each question carries equal marks. **(5 X 10M = 50M)**

11. A)	A system has unit sample response h(n) given by $h(n) = -1/\delta(n+1) + 1/2\delta(n) - 1/4\ \delta(n-1)$. Is the system BIBO stable? Is the filter causal? Justify your answer.	CO1	L3	10M
	OR			
B)	Determine whether the following system is: i) Linear ii) Causal iii) Stable, and iv) Time invariant. y (n)=log10 x (n) Justify your answer.	CO1	L3	10M
12. A)	Explain the use of FFT algorithms in linear filtering and correlation.	CO2	L3	10M
	OR			
B)	Compute the DFT for the sequence {1, 2, 0, 0, 0, 2, 1, 1}. Using radix -2 DIF FFT and radix -2 DIT- FFT algorithm.	CO2	L3	10M
13. A)	Use bilinear transformation method to obtain H(Z) if T= 1 sec and H(s) is 1/(s+1)(S+2).	CO3	L3	10M
	OR			
B)	Obtain the impulse response of digital filter to correspond to an analog filter with impulse response ha(t) = 0.5 e-2t and with a sampling rate of 1.0kHz using impulse invariant method.	CO3	L3	10M
14. A)	Explain FIR filter design using windowing method.	CO4	L3	10M
	OR			
B)	What is Hamming Window function? Obtain its frequency domain characteristics.	CO4	L3	10M
15. A)	The sequence x(n)=[0,2,4,6,8] is interpolated using interpolation sequence bk =[1/2,1,1/2] and the interpolation factor is 2.find the interpolated sequence y(m).	CO5	L3	10M
	OR			
B)	Derive the Frequency domain Transfer function of a Decimator.	CO5	L3	10M