SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations June-2024
DIGITAL SIGNAL PROCESSING
(Common to EEE & ECE)

Time: 3 Hours   Max. Marks: 60

PART-A
(Answer all the Questions **5 x 2 = 10** Marks)

1	a	Distinguish between linear and circular convolution?	CO1	L4	2M
	b	Describe impulse invariant method of desiging IIR filter	CO2	L1	2M
	c	What is recursive and non recursive realization?	CO3	L1	2M
	d	Compare fixed and floating point arithmetic?	CO5	L4	2M
	e	Mention the applications of PDSP's?	CO6	L1	2M

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2		Compute 8-point DFT of the sequence x(n) = {1,2,3,4,4,3,2,1} using radix-2 DIT-FFT algorithm.	CO1	L5	10M

OR

3	a	Identify the output y(n) of a filter whose impulse response is h(n) = [1,1,1] and input signal x(n) = [3, 1-, 0, 1, 3, 2, 0, 1, 2, 1] using overlap add method.	CO1	L2	7M
	b	Compute the IDFT of a sequence Y(K) = {1,0,1,0}	CO1	L5	3M

UNIT-II

4	a	For the given specification, determine the order of the filter by Butterworth model.	CO1	L5	5M

          $\alpha_p = 1$ dB $\alpha_s = 30$ dB
          $\Omega_p = 200$ rad / sec $\Omega_s = 600$ rad / sec.

	b	Explain the steps to be followed to design an analog chebyshev low pass filter.	CO1	L5	5M

OR

5		Apply the bilinear transformation, to design a high pass filter, monotonic in pass band with cut off frequency of 1000 Hz and down 10dB at 350 Hz. the sampling frequency is 5000Hz.	CO2	L3	10M

UNIT-III

6	a	Explain the Fourier Series method of Designig FIR Filter	CO3	L5	5M
	b	Distinguish between FIR and IIR Filter?	CO3	L5	5M

OR

7	a	Determine the Direct form realization of system function $H(z) = 1 + 2z^{-1} - 3z^{-2} - 4z^{-3} + 5z^{-4}$	CO3	L5	5M
	b	Obtain the linear phase realization of the system function $H(z) = \frac{1}{2} + 1/3z^{-1} - z^{-2} - \frac{1}{4}z^{-3} + z^{-4} + 1/3 z^{-5} + \frac{1}{2} z^{-6}$	CO3	L5	5M

8 a Tabulate the quantization error ranges of truncation and rounding for the various number representation? CO5 L2 5M

   b Draw and explain the power density functions for truncation and rounding CO5 L5 5M

OR

9 Explain the characteristics of limit cycle oscillation with respect to the system described by the difference equation y(n) = 0.7 y(n-1) + x(n). Determine the dead band range of the system. CO5 L5 10M

UNIT-V

10 With a neat sketch explain the architecture of TMS320C50 Processor? CO6 L5 10M

OR

11 a Distinguish between the dual-access RAM and single-access RAM used in the on-chip memory of 5X. CO6 L5 5M

    b Discuss the advantages and disadvantages of VLIW architecture. CO6 L1 5M

*** **END** ***