Q.P. Code: 20EC0417

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Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations March-2023

DIGITAL SIGNAL PROCESSING

(Electronics and Communication Engineering)

Time: 3 hours | Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

		UNIT-I			
1	a	Determine the 8 point DFT of the sequence x(n) = {1,1,1,1,1,1,1,0}.	CO1	L3	8M
	b	Find the IDFT of the sequence X(K) ={1,0,1,0}.	CO1	L3	4M
		OR			
2	a	List the methods for filtering of long duration sequences.	CO1	L1	2M
	b	Evaluate the output y(n) of a filter whose impulse response is h(n)={1,2} and input signal x(n)={1,2,-1,2,3,-2,-3,-1,1,1,2,-1} using overlap and save method and overlap add method.	CO1	L5	10M
		UNIT-II			
3	a	Compare Analog and Digital filters.	CO2	L2	2M
	b	Design an analog Butterworth filter that has 2dB pass band attenuation at a frequency of 20 rad/sec and at least 10dB stop band attenuation at 30 rad/sec.	CO2	L3	10M
		OR			
4	a	Explain the frequency transformation technique in analog domain for converting low pass to low pass filter and low pass to high pass filter with frequency response.	CO3	L2	6M
	b	Construct the cascade form structure of the system with difference equation $y(n) = \frac{3}{4}y(n-1) - \frac{1}{8}y(n-2) + x(n) + \frac{1}{3}x(n-1)$	CO2	L3	6M
		UNIT-III			
5	a	Design an FIR digital filter to approximate an ideal Low pass filter with pass band gain of unity, cutoff frequency of 1 KHz, and working at a sampling frequency f 4 KHz. The length of the impulse response should be 11. Use Fourier series method.	CO3	L3	6M
	b	Give the equations for Rectangular, Hanning and Hamming window and explain its significance.	CO2	L2	6M
		OR			
6	a	Write the design steps of FIR filter using Frequency sampling technique.	CO2	L2	6M
	b	Construct the Direct form realization of system function. $H(Z) = 1 + 2Z^{-1} - 3Z^{-2} - 4Z^{-3} + 5Z^{-4}$	CO3	L3	6M
		UNIT-IV			
7	a	Compare fixed point and floating point arithmetic.	CO4	L4	6M
	b	Discuss in detail the errors resulting from rounding and truncation.	CO5	L2	6M
		OR			
8	a	What is meant by Overflow limit cycle oscillations? Explain with example.	CO4	L2	6M
	b	Explain Signal scaling for second order IIR filter with necessary mathematical	CO4	L2	6M

expressions.

UNIT-V

9	a	What are the advantages of the DSP processors over conventional microprocessors?	CO6	L1	4M
	b	Illustrate on the various phases of pipelining concept.	CO6	L3	8M
		OR			
10	a	Explain internal memory organization in TMS320C54x architecture.	CO6	L2	6M
	b	What are the different buses of TMS320C54x and their functions?	CO6	L1	6M

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