Q.P. Code: 18EC0414 **R18**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations December-2021

DIGITAL SIGNAL PROCESSING

(Common to ECE & EEE)

Time: 3 hours Max. Marks: 60

PART-A

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

1	a	Find the DFT of a sequence x(n)={1,1,0,0 }	L1	2M
	b	What are the advantage and disadvantage of bilinear transformation?	L1	2M
	c	What is recursive and non-recursive realization?	L1	2M
	d	What is Dead band of a filter?	L1	2M
	e	What are the advantages and disadvantages of VLIW architecture?	L1	2M

PART-B

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

UNIT-I

2		Determine the 8 point DFT of the sequence x(n)={1,1,1,1,1,1,0,0}	L5	10M

OR

3	a	Compute the IDFT of a sequence Y(K)={1,0,1,0 }	L5	6M
	b	Summarize the differences and similarities between DIF & DIT FFT algorithms.	L5	4M

UNIT-II

4	a	Explain the steps to be followed to design an analog Butterworth filter.	L5	4M
	b	For the given specifications, Determine H(s) using Chebyshev approximation for the αp = 3 dB and αs =16 dB; fp=1 KHz and fs= 2 KHz.	L5	6M

OR

5	a	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.	L3	5M
	b	List the Butterworth polynomials for order 1 to 5 and give its significance	L4	5M

UNIT-III

6	a	Construct the cascade realization of FIR Filters for the function $H(z) = (1 + 2\,z^{-1} - z^{-2})\,(1 + z^{-1} - z^{-2})$	L6	5M
	b	State and explain the properties of FIR filters. State their importance.	L1	5M

OR

7	a	What is linear phase filter? What are the conditions to be satisfied by the impulse response of an FIR system in order to have a linear phase?	L1	6M
	b	List the desirable characteristics of the window	L1	4M

UNIT-IV

8		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.	L5	10M

OR

9	a	Summarize the various forms of representing the numbers in digital systems	L2	5M
	b	Represent the following numbers in floating point format with five bits for mantissa and three bits for exponent. i) 7_{10} ii) 0.25_{10} iii) -7_{10} iv) -0.25_{10}	L3	5M

UNIT-V

10	a	What is meant by memory mapped register? How is it different from a memory?	L1	5M
	b	Explain the function of CALU in detail	L5	5M

OR

11	a	Distinguish between the dual-access RAM and single-access RAM used in the on-chip memory of 5X.	L5	5M
	b	Compare the various architectures employed in designing a digital signal processor.	L5	5M

END