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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech III Year II Semester Regular Examinations August-2022

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 List out any five properties of DFT. Explain. L1 6M
b Compute the DFT of a sequence $X(n) = \{1, 1, 0, 0\}$. L2 6M

OR

- 2 a Explain Decimation in Time FFT algorithm with necessary expressions. L2 6M
b Compare Radix-2 DIT-FFT and DIF-FFT algorithms. L5 6M

UNIT-II

- 3 a Explain the steps in the design of an analog Chebyshev low pass filter. L2 6M
b Estimate the order of analog Butterworth filter that has 2 dB pass band attenuation at a frequency of 20 rad/sec and at least 10 dB stop band attenuation at 30 rad/sec. L5 6M

OR

- 4 a Explain the different types of IIR filter realization with suitable example. L2 6M
b Construct the parallel form structure of the system with difference equation $y(n) = -0.1y(n-1) + 0.72y(n-2) + 0.7x(n) - 0.252x(n-2)$ L3 6M

UNIT-III

- 5 a Explain briefly how zeros are located in FIR Filter. L2 6M
b List the desirable characteristics of the window. L1 6M

OR

- 6 Design an ideal High pass filter with the frequency response L6 12M
$$H_d(e^{j\omega}) = 1 \text{ for } \frac{\pi}{4} \leq |\omega| \leq \pi$$

$$= 0 \text{ for } |\omega| \leq \frac{\pi}{4}$$

Find the values of $h(n)$ for $N=11$. Find $H(Z)$ and plot the magnitude response.

UNIT-IV

- 7 a Discuss the various common methods of quantization. L2 6M
b What is quantization noise? Deduce the expression for quantization noise power. L4 6M

OR

- 8 a Conclude on steps to prevent limit cycle oscillations. Explain. L5 6M
b What is a dead band of a filter? Explain. L1 6M

UNIT-V

- 9 a Summarize the overview of digital signal processors. L2 6M
b What are the different buses of TMS320C5X and their functions? L1 6M

OR

- 10 a Explain the function of Serial port interface. L2 6M
b Explain in detail the application of PDSP's in the field of communication systems. L2 6M

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