Q.P. Code: **16EC3802** **R16**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year I Semester Regular & Supplementary Examinations February 2018
ADVANCE DIGITAL SIGNAL PROCESSING
(DECS)

Time: 3 hours Max. Marks:**60**

(Answer all Five Units **5 X 12 =60** Marks)

UNIT-I

1	a	Explain the types of discrete time systems with example.	6M
	b	Prove that the system defined by the following difference equation is an LTI System. Given y(n) = x(n+1)-3x(n)+x(n-1) ; n≥0.	6M
		OR	
2	a	What is the relationship between impulse response of LTI-DTS and its frequency response?	6M
	b	Find the 8-point DFT of the given time domain sequence x(n)={1.2.3.4}	6M

UNIT-II

3	a	Explain the poly-phase structure of Digital filters.	6M
	b	Realize the 4th order FIR transfer function using cascaded lattice structure. $H_4(z) = 1 + 1.2Z^{-1} + 1.12Z^{-2} + 0.12Z^{-3} + 0.08Z^{-4}$	6M
		OR	
4	a	Explain the Pade's approximation method for designing IIR filter	6M
	b	Explain the state space structure of Digital filters.	6M

UNIT-III

5	a	Define sampling rate conversion. Explain the Process of Interpolation by a factor I	6M
	b	Explain clearly the importance of DFT in signal processing and hence bring out the procedure for implementation of DFT using FFT.	6M
		OR	
6	a	What is multirate system? What is the need of this multirate system? Explain	6M
	b	Explain the Cooley-Tukey FFT algorithm for FFT computation	6M

UNIT-IV

7		Determine the frequency resolution of Bartlett, Welch, and Blackman-Tukey methods of power spectrum estimates for a quality factor Q=10. Assume that overlap in Welch method is 50% and length of sample sequence is 1000..	12M
		OR	
8	a	Determine the frequency resolution of Bartlett, Weltch and Blackman-Tukey.	6M
	b	Obtain the simplified relation between the parameters and Auto core ration parameters of AR model of order N and explain the power spectral estimation using this model	6M

UNIT-V

9	a	Explain the applications of DSP in oversampling sigma-delta D/A convertor	6M
	b	Explain in detail, the finite word length effects in IIR digital filter	6M
		OR	
10	a	Briefly discuss about the musical sound processing by DSP	6M
	b	The system difference equation is y(n) = 0.5 y(n-1) – 0.6 y(n-2) + 2x(n). [5M] Calculate quantization step, variance of the error signal and variance of the Quantization noise at the output for a input signal in the range 10 V.	6M

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