Hall Ticket No: | | | | | | | | | | | **Question Paper Code :**

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES
(AUTONOMOUS)

M.E/M.Tech I-Semester Regular Examinations, November 2015

ADVANCED DIGITAL SIGNAL PROCESSING
(Communication Systems)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT-I

1. **a.** Compare FIR and IIR filters (CO-1,PO-1,3,4) **(6M)**
b. Design i) butterworth ii) chebyshew analog lowpass filters that have -3dB cutoff frequency of 100 rad/sec and a stop band attenuation of 25dB or greater for radian frequencies past 250 rad/sec. (CO-1,PO-1,3,4) **(6M)**

(or)

2. **a** Explain the Remez Algorithm, Parks-McClellan Algorithm **(4M)**
b. Describe and explain the Optimization methods for designing IIR filters(CO-1,4, PO-1,3,4,8) **(8M)**

UNIT-II

3. **a**. Explain about aliasing effect and imaging with neat frequency domain representation **(4M)**
b. Decimating x(n)by a factor of D=2 produces the signal $x_d(n)=x(2n)$ for all n. Show that $x_d(w)=x_s(w/2)$. Plot the signal $x_d(n)$ and its transform $x_d(w)$. Do we decimated the sampled signal $x_s(n)$ **(4M)**
c. write about the filters used in sampling rate alteration devices(CO-2,4, PO-1,3,4)**(4M)**

(or)

4. **a.** Describe the subband coding of speech signals in detail. **(4M)**
b. Explain about the analysis and synthesis of Digital filter banks(CO-2,4, PO-1,3,4)**(8M)**

UNIT-III

5. **a**. Define AR,MA,ARMA processes with respect to rational system function H(Z). **(8M)**
b. what are the various parameters required to implement forward linear prediction and how they are obtained(CO-2,3,4, PO-1,3,4) **(4M)**

(or)

6. **a.** Explain the relationship between forward and backward linear filtering **(4M)**
b. Explain about the wiener filter for filtering on prediction**.** (CO-2,3,4, PO-1,3,4) **(4M)**

UNIT-IV

7.	**a**. Explain the Bluestein algorithm(CO-2,4, PO-1,3,4)	**(4M)**
	b. Discuss about the tunable digital filters	**(5M)**
	c. Give the relation between Levinson- Durbin algorithm and Schur Algorithm	**(3M)**

(or)

8.	**a.** Explain about Chirp-Z algorithm with neat diagrams. (CO-2,4, PO-1,3,4)	**(8M)**
	b. How is the chirp-Z algorithm different from Goertzel algorithm.	**(4M)**

UNIT-V

9.	**a**. Explain about the TDM to FDM converter in detail (CO-4,5, PO-1,3,4,7.12)	**(4M)**
	b. Explain briefly about Speech analysis and synthesis**.**	**(8M)**

(or)

10.	**a.** What is a channel Vocoder.Explain its operation**.**	**(5M)**
	b. Explain about the 10MHz pipelining convolver**.**	**(7M)**