JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.Tech I Semester Regular Examinations March/April 2010
ADVANCED DIGITAL SIGNAL PROCESSING
(Common to Embedded Systems, DS&CE, VLSI System Design/VLSI/ VLSI Design)

Time: 3hours   Max.Marks:60
Answer any five questions
All questions carry equal marks
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1.a) Compare FIIR and IIR filters and show which filter has got linear phase characteristics
 b) Explain clearly one application of multirate signal processing.

2.a) In implementing a sampling rate converter by a rational factor I/D which sampling rate converter block should follow the other. Explain the reasons.
  b) What is multirate signal processing and why it is necessary in digital signal processing.

3.a) What are the issues in spectral estimation? What is the effect of these issues on the spectral characteristics in practice
  b) Distinguish clearly the role of autocorrelation on power spectral estimation and hence give expressions for bias and variance incase of periodogram technique using Barlett method

4.a) Determine impulse response h(n) for the system represented by
        $y(n) – 3y(n+1)-4y(n-2) = x(n)+2x(n-1)$ given that $x(n)= 8^n u(n-1)$
  b) Explain in detail Burg method for power spectrum estimation

5.a) Derive the relation between autocorrelation and model parameters for power spectrum estimation.
  b) Explain how to solve normal equations using Levinson Durbin algorithm

6.a) Explain properties of linear prediction filters
  b) State and prove any four properties of auto correlation function

7.a) Derive the optimum reflection coefficient for lattice forward predictor
  b) What do you understand by the word Finite word error? Explain the reasons for it and distinguish clearly the finite word error in floating point and fixed point arithmetic.

8. Write short notes on :
a) Finite word length effects in FFT algorithms
 b) ARMA model for power spectrum estimation

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