R09

Code No: C3802

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH I SEMESTER EXAMINATIONS, APRIL/MAY-2012
ADVANCED DIGITAL SIGNAL PROCESSING
(DIGITAL ELECTRONICS & COMMUNICATION SYSTEMS)

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

Answer any five questions
All questions carry equal marks

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1. a) Compare FIR and IIR Filters
   b) What is the need for Multirate Sampling in real time applications and discuss the problems that arise due to Downsampling of the data and how to overcome them. Explain in detail with necessary mathematical expressions.

2. Write a short note on any two of the following
   a) Design of Phase shifters
   b) Sub-band Speech coding
   c) Narrowband Filter Design

3. a) Define Spectrum and hence discuss the importance of spectral analysis
   b) Discuss in detail the estimation of Power Spectra using Bartlett method and also derive the expression to calculate the variance of power Spectrum.

4. a) Prove that Periodogram is an inconsistent method of Power Spectrum Estimation
   b) Compare various Non-Parametric methods of power spectrum estimation with respect to Figure of Merit, Quality, Variability, Resolution and No. of Computations.

5. a) Compare Parametric and Non-Parametric Methods of Power Spectrum estimation
   b) Bring out the relationship between the Parameters of AR, MA and ARMA Models of power Spectrum estimation and autocorrelation matrix of input data.

6. a) Define Linear Prediction and state the properties of it
   b) Discuss the procedure of estimating the parameters of the system using Levinson Durbin Algorithm.

7. a) What are the Main errors that occur due to finite representation of data
   b) Define Limit Cycles and discuss its types in detail.

8. a) Compare Fixed and Floating type of Processors
   b) Discuss Finite word length effects w.r.to IIR filter structures.

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