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Question Paper Code: 52221

M.E. DEGREE EXAMINATION, NOV 2016

First Semester

Communication Systems

15PCM101 - ADAPTIVE SIGNAL PROCESSING

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART - A $(5 \times 20 = 100 \text{ Marks})$

1. (a) Explain and derive the expression for signal modeling using pade approximation. (20)

Or

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	$(\Delta \Omega)$
(b) Unitain the expression for all _note modeling lising PronV s method	()())
(0) Obtain the expression for an pole modering using from y 5 method.	(20)

2. (a) Derive the variance of the periodogram using Blackman-Tukey method. (20)

Or

- (b) (i) Explain how power spectrum can be estimated from the AR model. (10)
 - (ii) Discuss the Welch method of periodogram averaging. (10)
- 3. (a) (i) Describe the basics of forward linear prediction. Give the schematic of FIR filter and Lattice filter for the first order predictor. (10)
 - (ii) Derive the recursive predictor coefficients for optimum lattice predictor by Levinson-Durbin algorithm. (10)

Or

- (b) Derive Wiener Hopf equations and the minimum mean square error for a causal wiener filter. (20)
- 4. (a) Explain steepest descent algorithm for FIR adaptive filter. (20)

- (b) Discuss the convergence of the LMS algorithm in detail. (20)
- 5. (a) Describe the mathematical equations how sampling rate can be increased by a factor of L. (20)

Or

(b) With necessary equations and diagrams, discuss about the interpolation and decimation in multirate signal processing. (20)