

E

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Question Paper Code: 51Q01

M.E. DEGREE EXAMINATION, APRIL 2019

First Semester

Communication Systems

15PCM101 - ADAPTIVE SIGNAL PROCESSING

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART - A (5 x 20 = 100 Marks)

1. (a) Explain shank's method for solving normal equations. CO1- U (20)
Or
(b) Explain and derive the expression for signal modeling using pade approximation. CO1- U (20)
2. (a) Let $r_x(k)$ be a complex autocorrelation sequence given by $r_x = [2, 0.5(1+j), 0.5j]^T$. Use the Levinson-Durbin recursion to solve the autocorrelation normal equations for a second order all-pole model. CO2- App (20)
Or
(b) Derive the variance of the periodogram using Blackman-Tukey method. CO2- App (20)
3. (a) Derive Wiener Hopf equations and the minimum mean square error for the FIR wiener filter. CO3- App (20)
Or
(b) Briefly explain the estimation of a non stationary process by a Kalman filter. CO3- U (20)

4. (a) Explain normalized LMS algorithm. CO4- U (20)
- Or
- (b) Explain the RLS algorithm with the exponentially weighted factor. CO4- U (20)
5. (a) Explain the need for multistage implementation of sampling rate conversion. Describe the implementation for a factor of I/D. CO5- U (20)
- Or
- (b) Enumerate in detail about the continuous and discrete wavelet transform. CO5- U (20)