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**E Reg. No. :**

**Question Paper Code: 51P21**

M.E. DEGREE EXAMINATION, NOV 2017

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)

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| 1. | (a) | State and prove wiener - khinchine relation. | CO-1 U | (20) |
|  |  | Or |  |  |
|  | (b) | Explain shank’s method for solving normal equations. | CO-1 U | (20) |
|  |  |  |  |  |
| 2. | (a) | Derive the variance of the periodogram using Blackman-Tukey method. | CO-2 App | (20) |
|  |  | Or |  |  |
|  | (b) | Explain how the Yule-Walker equations can be solved using Levinson-Durbin algorithm | CO-2 U | (20) |
|  |  |  |  |  |
| 3. | (a) | Derive Wiener Hopf equations and the minimum mean square error for the FIR wiener filter. | CO-3 App | (20) |
|  |  | Or |  |  |
|  | (b) | Explain Weiner deconvolution. | CO-3 U | (20) |
|  |  |  |  |  |
| 4. | (a) | Obtain Widrow-Hoff LMS adaptation algorithm. | CO-4 U | (20) |
|  |  | Or |  |  |
|  | (b) | Explain normalized LMS algorithm. | CO-4 U | (20) |
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| 5. | (a) | Enumerate the detail about the continuous and discrete wavelet transform. | CO-5 Ana | (20) |
|  |  | Or |  |  |
|  | (b) | Design a two stage decimator for the following specifications  D = 100, Pass band 0≤F≤50Hz, Transition band  50 ≤F≤55Hz and Input sampling rate10KHz  Ripple S1 = 1/10 and S2 = 1/1000. | CO-5 Ana | (20) |
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