Total No. of Questions :8] *[Total No. of Printed Pages :2*

Roll No .....

MEMT - 204

M.E./M.Tech., II Semester

Examination, June 2014

Theory of Random Signal

Time : Three Hours

Maximum Marks : 70

Note : i) Attempt any five questions.
ii) Each question carry equal marks.
iii) Assume suitable data wherever necessary.

1. a) Explain probability density function and its properties.
   b) Probability Density Function (PDF) is given by the expression $fx(x) = a\, e^{-b|x|}$, here 'x' is the random variable whose values lies in the range $x = -\infty$ and $x = +\infty$. Determine the following:
      i) The relation between 'a' and 'b'.
      ii) Cumulative Distribution Function (CDF)

2. a) Explain central value theorem.
   b) Explain optimal filtering.

3. a) Discuss forward and backward linear filter prediction.
   b) Discuss Weiner filter for filtering of prediction.

4. a) Give Estimation of Autocorrelation of Random signals.
   b) Discuss Periodogram.

5. a) Explain Non-stationary processes.
   b) Find two dimensional Fourier transform for Random inputs.

6. Discuss SIN ratio in various digital modulation techniques.

7. a) Explain linear prediction.
   b) Explain Mine-Kol Mogorov Theory.

8. Write short notes on any two:
   a) Parametric method of power spectrum estimation.
   b) Generalized harmonic analysis.
   c) Band limited processes.

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