R09

Code No: C6105, C6505

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH I SEMESTER EXAMINATIONS, APRIL/MAY-2012
DETECTION AND ESTIMATION THEORY
(COMMON TO COMMUNICATION SYSTEMS, WIRELESS & MOBILE COMMUNICATIONS)

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

Answer any five questions
All questions carry equal marks
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1.a) What is meant by hypothesis?
b) Explain about a simple Binary Hypothesis test using an example of a real time application of radar.

2.a) Differentiate between periodic random processes and vector random processes.
b) Write about spectral decomposition.

3.a) Highlight the difference between detection and estimation with examples.
b) In detail, discuss about detection and estimation of signals affected by White Gaussian Noise using Maximum likelihood estimation.

4.a) Discuss in detail about Neyman-Pearson criterion for radar detection of constant amplitude signals.
b) Write about minimum variance unbiased estimator and best linear unbiased estimator.

5.a) What is Cramer - Rao lower bound?
b) Discuss how a lower bound on the mean square estimation error helps to obtain tighter lower bounds improving the SNR threshold prediction.

6.a) Write about non-random waveform estimation.
b) Draw the block diagram of the Kalman filter model and algorithm.
c) Write a brief summary of the Kalman filter algorithm in four steps.

7.a) Explain the fundamental role of optimum linear filters.
b) How Kalman-Bucy filters are different from Kalman filters.

8. Write notes on the following:
(a) Parameter (b) Parameterized PDF
(c) Estimator (d) Estimate
(e) Bias (f) Variance

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