

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
