CODE NO: R0 5321103

2008 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

III B.TECH SUPPLIMENTARY EXAMINATIONS
BIO-MEDICAL SIGNAL PROCESSING
(BIO-MEDICAL ENGINEERING)

AUG/SEP 2008

TIME: 3 HOURS
MAX MARKS: 80

Answer any FIVE Questions
All Questions carry equal marks

1. A Gaussian random signal has a mean value of 10 and variance of 25.

(a) What is the probability that an observed value of the signal is greater than zero?

(b) What is the probability that an observed value of the signal is greater than the twice of the mean value?

(c) What is the probability that an observed value of the signal is greater than zero but less than or equal to the mean value?

2. (a) Write the Properties of auto correlation.

(b) Write the Properties of power spectral density.

3. (a) What is the need for compression of medical data? Briefly explain with an example?

(b) What are the factors that influence the performance of a data reduction algorithm?

(c) Define percent root-mean-square-difference (PRD) with respect to data compression and give an expression for PRD.

4. (a) Explain a technique to remove 50Hz noise from the ECG recording.

(b) How do you determine Tachycardia in an ECG recording?

5. (a) Explain the different types of interferences present during acquisition of biological signals

(b) Write the acquisition of ECG signal from a heart transplant patient.

6. Explain second order correlation canceller and calculate the prediction coefficients.

7. (a) Describe the characteristics of different stages of sleep in terms of frequency, voltage levels.

(b) Explain the EEG rhythms and transients with waveforms.

8. (a) What are salient features of prony's method and explain in detail?

(b) Write the difference between FFT and prony's method.