

Roll No.....

Total No. of Printed Pages: 1

Total No. of Questions: [09]

B. Tech (ECE) (Semester – 3rd)
SIGNALS & SYSTEMS
Subject Code: BECE1305
Paper ID: [111305]

Time: 03 Hours

Maximum Marks: 60

Instruction for candidates:

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A

(2 marks each)

- Q1. Attempt the following:
- a) What is DTFT?
 - b) Define matched filter.
 - c) What do you mean by Ergodicity?
 - d) State properties of linear convolution.
 - e) What is mean and variance of Gaussian pdf?
 - f) Differentiate between causal and non-causal systems.
 - g) What is the importance of sampling theorem?
 - h) What is noise figure?
 - i) What are elementary signals?
 - j) Determine whether the following systems are linear or non-linear
 $y(n) = x(n^2)$.

Section – B

(5 marks each)

- Q2. Compare power spectral density and energy spectral density (with properties) of Fourier Transform.
- Q3. Define probability. A box contains 5 white, 3 red and 2 black balls. Three balls are drawn in succession. Find the probability that the balls will be of different colours.
- Q4. Derive the relationship between noise figure and equivalent noise temperature for a cascade system.
- Q5. What is a signal? How these are classified? Explain in detail.
- Q6. Define joint CDF and PDF. Explain its properties.

Section – C

(10 marks each)

- Q7. Explain the various properties of Fourier Transform and prove each property.
- Q8. What is sampling theorem? Derive the expression for band limited and band pass signals.
- Q9. (a) What is an LTI system? Explain various properties of LTI system.
(b) Define random variable and random process. Also discuss their importance in signals.