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Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech.(Electronics Engg.) (2012 Onwards)**  
**B.Tech.(ECE/ETE/Electronics & Computer Engg.) (2011 Onwards)**  
**(Sem.-4)**

**SIGNAL AND SYSTEMS**

Subject Code : BTEC-402

Paper ID : [A1190]

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTION TO CANDIDATES :**

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

**SECTION-A**

**Q.1 Answer briefly :**

- a) State properties of linear convolution.
- b) What is sampling theorem?
- c) Define Convolution theorem.
- d) What is mean and variance of Gaussian pdf?
- e) What is central Limit Theorem?
- f) What is noise figure?
- g) Define power spectral density.
- h) Give the Dirichlet Condition.
- i) What is the difference between causal and non-causal system?
- j) What do you mean by ergodicity?

### SECTION-B

- Q.2 Derive relationship between noise figure and equivalent noise temperature for a cascade system.
- Q.3 Calculate SNR for Matched filter.
- Q.4 Write a note on various types of Noise.
- Q.5 State and prove time scaling and multiplication properties of Fourier series.
- Q.6 Prove the periodicity of  $y(t) = \cos(\omega t + \phi)$  and  $y(t) = e^{j\omega t}$ ,  $\omega \neq 0$ , also find 3 fundamental periods.

### SECTION-C

- Q.7 What is sampling theorem? Derive the expression for band limited & band pass signal.
- Q.8 What is Complex convolution Theorem? Find convolution of linear and circular convolution.
- Q.9 Discuss the properties of Laplace Transform. For a LTI system, the impulse response  $h(t) = u(t)$  Find :
- a) Characteristic roots of the system.
  - b) Stability of the system.
  - c) Is this BIBO stable?
  - d) What can this system be used?