Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ECE) (2012 to 2017)   (Sem.–4)
# SIGNAL AND SYSTEMS
Subject Code : BTEC-402
M.Code : 57594

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

1. **Answer briefly :**

   a) Differentiate Energy and power signals.

   b) Explain joint and conditional probability with example.

   c) What is power spectral density?

   d) Discuss the spectrum of continuous time signals.

   e) Define sampling theorem.

   f) What is meant by difference equation?

   g) Explain Ergodic process.

   h) What is central limit theorem?

   i) What is LT1 system? Explain with the help of example.

   j) Discuss random processes.

SECTION-B

2. Define Signal. Discuss the classification of signals with suitable example.

3. Determine the Fourier Transform of the unit step function u (t).

4. Discuss the convolution integral representation of LTI system.

5. Discuss the properties of Fourier transform and prove at least four of them.

6. Derive a relationship for transmission of random processes through linear system.

SECTION-C

7. What is DTFT? Discuss various properties of DTFT.

8. a) Calculate the Z- transform of : $x(n) = a^n u(-n-1)$

   b) Find the system function H(z) and unit sample response h(n) of the system whose difference equation can be described by $y(n) = \dfrac{1}{2y(n-1)} + 2x(n)$, where $y(n)$ and $x(n)$ are the output and input of system.

9. Explain in detail the representation of a signal using complex exponential Fourier series.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.