Roll No. [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ] Total No of Pages : 02

Total No. of Questions : 09

B.Tech.(Electronics Engg.) (2012 onwards)

B.Tech.(ECE) / (Electronics & Comp. Engg.) / (ETE) (2011 onwards)

(Sem.–4)

SIGNAL & 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 has to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.**

SECTION-A

1. **Write briefly :**

a) Differentiate between deterministic and non-deterministic signals.

b) How a continuous time signal represented mathematically?

c) How do you obtain a discrete time signal from a continuous time signal?

d) Determine whether the system $y(t) = t\,x(t)$ is time variant or not.

e) State the relation between discrete time unit impulse and discrete time unit step signal.

f) Differentiate between joint and conditional probabilities.

g) What is difference equation?

h) Define sampling theorem.

i) Define a discrete time unit ramp sequence.

j) Show that $\delta(n) = u(n) - u(n-1)$.

SECTION-B

2. Explain various types of signals.

3. Find out the system function and impulse response of the system described by the following difference equation :

$$y(n) = \frac{5}{3} y(n-1) + 4x(n)$$

4. What are the properties of Fourier transform?

5. Find the Z-Transform and ROC of the following sequence :

   X (n) = {1, 2, 3, 4, 0,1}

6. Explain the concept of transformation of random variables.

SECTION-C

7. Compute DFT :

$$x(n) = \begin{cases} 1 : n \ \ even & 0 \le n \le N-1 \\ 0 : n \ \ odd & 0 \le n \le N-1 \end{cases}$$

8. Define Power Spectral Density. Find PSD for x (t) =Acos2πfct and hence find the average power of the signal x(t).

9. Write short notes on :

   a) Energy and power signal

   b) Causal and non-causal system

   c) Time-variant and time-invariant system

   d) Static and dynamic system.