

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech.(ECE) (Sem.-4)**  
**SIGNALS AND SYSTEMS**

Subject Code : BTEC-402

M.Code : 57594

Date of Examination : 14-07-22

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) Calculate the Fourier transform of unit step function.
- b) Differentiate between CDF and PDF.
- c) Define random process.
- d) Define aliasing effect.
- e) What is LTI system?
- f) Define even and odd signals.
- g) List the properties of Z-transform.
- h) What is stationary process?
- i) Define true averages.
- j) What is continuous time and discrete time signals?

## SECTION- B

2. Differentiate random and deterministic signals.
3. Obtain the convolution of the following two signals :

$$x(t) = u(-ty)$$

$$h(t) = u(t - 3)$$

4. Obtain the Fourier transform of  $x(t) = te^{-at} u(t)$ .
5. Discuss the representation of Continuous-Time Signals in Terms of Impulses.
6. Obtain the relationship between DTFT and Z-transform.

## SECTION-C

7. Write a short note on :
  - a. Unit Step
  - b. Unit Ramp
  - c. Unit Pulse
  - d. Unit Impulse.
8. Find the value of the constant C, if the joint PDF of two random variables X & Y is given by :
$$(x, y) = C(2x + y) \quad \text{for } 0 \leq x \leq 2, 0 \leq y \leq 3$$
$$0 \quad \text{elsewhere}$$
9. Explain the concept of probability mass function statistical averages.

**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.**