

BT-3/D-24
SIGNALS AND SYSTEMS
Paper : EC-209A

Time : Three Hours]

[Maximum Marks : 75

Note : There are eight questions in total organized into four units. Candidates have to attempt *five* questions selecting at least *one* from each unit. All questions carry equal marks.

UNIT-I

1. What do you understand by a signal? Describe various types of signals. (15)
2. (a) What are linear time invariant systems? Discuss their properties. (7)
(b) With the help of sketches, explain the concept of causal and non-causal systems. (8)

UNIT-II

3. Describe the terms pdf, cdf, moments, distributions and correlation functions in detail. (15)
4. Evaluate the convolution between following two signals :
 $x(t) = 2u(t-1) - 2u(t-3)$ and $h(t) = 2u(t) - 2u(t-2)$. (15)

UNIT-III

5. What do you mean by sampling? With the help of suitable mathematical expressions, elaborate the concept of under and over-sampling. Highlight their disadvantages in reconstruction of the signal. (15)
6. (a) Expand $\cos^2 x$ as a Fourier series in the interval $(-\pi, \pi)$. (10)
- (b) Describe DTFS. (5)

UNIT-IV

7. Find out the Fourier transform of $e^{-a|t|}$. (15)
8. Explain the properties and region of convergence of Laplace transform. (15)

EXAMKIT