

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- FEB-2023

COURSE CODE(04): 20B11EM412

MAX. MARKS: 15

COURSE NAME: SIGNALS AND SYSTEMS

COURSE INSTRUCTORS: Prof. Rajiv Kumar

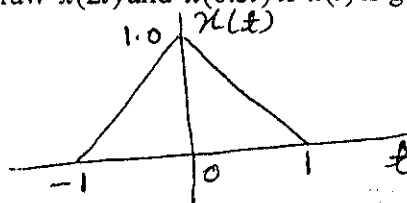
MAX. TIME: 1 Hour

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Qu.1: Explain unit impulse and unit step signals. Also, give the mathematical formulation corresponding to both signals for continuous and discrete time signals. [3, CO-1]

Qu. 2: a) What do mean by the compression and stretching of a signals? [1, CO-1]

b) Draw $x(2t)$ and $x(0.5t)$ if $x(t)$ is given as below. [2, CO-1]



Qu. 3: Prove that odd part of a generalized signal $x(t)$ is $\frac{x(t) - x(-t)}{2}$ [2, CO-1]

Qu. 4: A system is defined by following relationship:

$$y(n) = \sum_{k=-\infty}^{\infty} x(k)$$

Find its invertible and inverse system. [4, CO-1]

Qu. 5: Following three different systems are given:

a) $y(t) = 10x(t) + 5$

b) $y(t) = 2 \frac{dx}{dt} + 5$

c) $y(t) = 2 \frac{dx(t)}{dt} + x(t)$

Check, which one is linear or non-linear [3, CO-2]