

Total No. of Questions : 4]

SEAT No. :

PD18

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S.E. (Electronics/E&TC/Electronics & Computer Engg.)/(Electronics Engg. (VLSI Design & Technology))/(Electronics & Communication-Advanced Communication Technology)
SIGNALS & SYSTEMS
(2019 Pattern) (Semester-IV) (204191) (Insem)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) Attempt Q.1 or Q.2 Q.3 or Q.4.
- 2) Neat diagram must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of electronic pocket calculator is allowed.
- 5) Assume suitable data if necessary.

Q1) a) Evaluate the following integral using the property of impulse signal. [4]

$$\int_{-\infty}^{+\infty} e^{-5t^2} \delta(t-4) dt$$

b) Consider a signal given by $x(t) = \cos(t) + \sin(t) + \cos(t)\sin(t)$ [6]
Find the even part and odd part of the signal.

c) The discrete time system described by $y[n] = \cos[x(n)]$
Determine whether system is causal, linear, time variant, and static, stable. [5]

OR

Q2) a) Determine whether the signal is energy signal or power signal and find its energy and power. [5]

$$x(t) = e^{-5t} u(t)$$

b) Sketch the following signal [6]

$$x(t) = u(t) + u(t-2) + u(t-4) - 3u(t-6)$$

c) Check whether given signal is periodic or aperiodic. If periodic, find the period of the signal. [4]

$$x(t) = 3 \sin(4\pi t) + \sin(3\pi t)$$

P.T.O.

- Q3) a)** Compute the convolution integral of two given signals using graphical method. [6]

$$x(t) = 1 \dots \dots \dots 0 \leq t \leq 2$$

$$h(t) = e^{-2t}u(t)$$

- b) An LTI system has impulse response [4]

$$h(t) = u(t+1) - u(t-3)$$

Determine whether the system is causal, stable and memoryless,

- c) Write down the expression for convolution integral and convolution sum. Also state the properties of convolution. [5]

OR

- Q4) a)** Determine the convolution sum of the following sequence using equation of convolution sum: [6]

$$x(n) = u(n) - u(n-4)$$

$$h(n) = (1,1,1,1)$$

- b) Determine the Step response of the following system whose impulse response is $h(t) = e^{-5t}u(t)$. [4]

- c) Consider the interconnections of the systems as shown in fig. Let the impulse response be specified as [5]

$$h_1(t) = u(t)$$

$$h_2(t) = \delta(t)$$

$$h_3(t) = \delta(t - 1)$$

Obtain the overall impulse response of the system.

