R18

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year I Semester Examinations, March - 2021
SIGNALS AND SYSTEMS
(Common to ECE, EIE)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

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1.a) State and prove the properties of Impulse Function.
  b) How to approximate the given signal using complete set of orthogonal functions? Explain with one example. [6+9]

2.a) Find the Exponential Fourier series of train of impulses.
  b) Find the Fourier Transform of the signal $x(t) = e^{-a|t|}$. [7+8]

3.a) Find and sketch the impulse response of Ideal Band pass Filter.
  b) Find the convolution between the following signals:
  $$x(t) = e^{-at}u(t); h(t) = e^{-bt}u(t)$$ [7+8]

4.a) Find the impulse response of the system described by the differential equation.
  $$y''(t) + 5y'(t) + 4y(t) = 6x(t)$$
  b) State and prove initial final value Theorems of Z-transform. [7+8]

5.a) State and prove Sampling theorem for band limited signals.
  b) Derive the relationship between Autocorrelation function and Power spectral density function. [9+6]

6.a) Find the Hilbert Transform of the signal $x(t) = \cos(t) + \sin(t)$.
  b) Check the stability of the system $y(t) = tx(t)$. [7+8]

7.a) Derive the conditions for distortion less transmission through a system.
  b) State and prove the multiplication theorem of Fourier Transform. [7+8]

8.a) State and prove time shifting property of Laplace Transform.
  b) State and prove convolution theorem of z-transform. [7+8]

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