Code: R7210404

R07

II B.Tech I Semester (R07) Supplementary May 2012 Examinations
SIGNALS & SYSTEMS
(Common to Electronics & Communication Engineering, Electronics & Instrumentation Engineering and Electronics & Control Engineering)

Time: 3 hours **Max. Marks: 80**

Answer any FIVE questions
All questions carry equal marks

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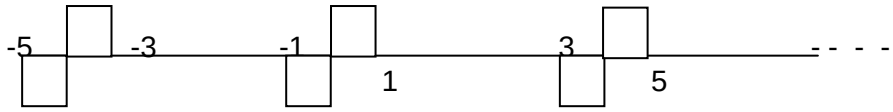
1. Explain the concept of signal space and hence approximation of a function using complete set of orthogonal functions. Give an example for complete set of orthogonal functions.

2. (a) Explain Dirichlet's conditions and properties of Fourier series.
   (b) Find the Fourier series of the signal shown below.



3. (a) Explain through an example how a discrete spectrum of a periodic signals tends to become continuous spectrum when period of the signal tend to infinity.
   (b) Find the Fourier transform of signum function.

4. (a) Differentiate between LTI and LTV systems. What criteria has to be satisfied for a system to be physically realizable?
   (b) Find the impulse response of a system modeled by differential equation $2\frac{dy(t0)}{dt} + y(t) = x(t)$ where $x(t)$ is the input and $y(t)$ is the output.

5. (a) Explain the relation between convolution and correlation.
   (b) Discuss and detection of signals in the presence of noise through correlation.

6. State and prove sampling theorem.

7. (a) State and prove initial value and final value theorems of Laplace transform.
   (b) Find the Laplace transform of periodic signal $Cos\omega t$.

8. (a) Differentiate between Fourier Transform, Laplace Transform and Z-Transform.
   (b) Determine Inverse Z-Transform of $X(z) = \frac{1}{(1-z^{-1})(1-0.8z^{-1})(1-0.5z^{-1})}$

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