Code: R7221904

R07

B.Tech II Year II Semester (R07) Supplementary Examinations, April/May 2013
SIGNALS & SYSTEMS
(Electronics & Computer Engineering)

Time: 3 hours   Max Marks: 80

Answer any FIVE questions
All questions carry equal marks

****

1. (a)   Define unit step signal and unit sample signal with graphical representation.
    (b)   Approximate the function described below by a waveform sint over the interval (0, 2π).
          f(t) = 1   0 < t < π
                = -1   π < t < 2π
          Also sketch the original and approximated functions.

2. (a)   Discuss the concept of exponential Fourier series and derive the expressions for coefficients.
    (b)   State the properties of Fourier series.

3. (a)   Find the Fourier Transform of a symmetrical gate pulse.
    (b)   State and prove time convolution property of Fourier Transform.

4. (a)   Briefly discuss about classification of systems.
    (b)   Explain the characteristics of ideal filters and why they cannot be realized.

5. (a)   Obtain the convolution of the following signal.
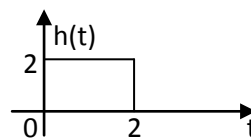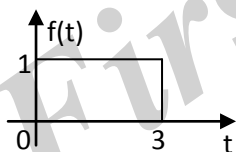
    (b)   Show that convolution and correlation are same for even signals.

6. (a)   State and prove sampling theorem for Band limited signals.
    (b)   Compare natural and flat top sampling techniques.

7. (a)   Find the Laplace Transform of
          (i) $x(t) = e^{-at} \sin\omega t$ (ii) $e^{-2t}u(-t)$
    (b)   Find the inverse Laplace Transform of
          $x(s) = \dfrac{3s^2 + 22s + 27}{(s^2 + 3s + 2)(s^2 + 2s + 5)}$

8. (a)   Determine Z-Transform, ROC, pole zero locations of
          (i) $x(n) = a^n u(n)$ (ii) $x(n) = a^n u(-n-1)$
    (b)   State and prove any two properties of z- transform.

******