Printed Pages:01   **Subject Code: REC 303**

Paper Id: | 130303 | **Roll No.** | | | | | | | | | | |

B TECH
(SEM-III) THEORY EXAMINATION, 2018-19
SIGNALS AND SYSTEMS

Time: 3 Hours   *Total Marks: 70*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. **Attempt all questions in brief.**   2 x 7 = 14
    a) Distinguish between energy and power signal.
    b) define power spectral density
    c) Explain significance of convolution in a communication system.
    d) What are advantages of Laplace transform?
    e) What are the limitations of Fourier transform?
    f) define a signal
    g) What is interpolation in sampling?

SECTION B

2. **Attempt any *three* of the following:**   7 x 3 = 21
    a) Classify signals according to signal characteristics.
    b) Explain the principle of linearity of DT system.
    c) Explain the following properties of Fourier transform: time scaling, conjugate functions.
    d) state and prove initial and final value theorem of Laplace transform
    e) State and prove sampling theorem

SECTION C

3. **Attempt any *one* part of the following:**   7 x 1 = 7
    a) What is Shannon's sampling theorem? Also discuss aliasing by taking an example.
    b) Explain the impulse train sampling of discrete time signals.

4. **Attempt any *one* part of the following:**   7 x 1 = 7
    a) State whether the following signals x (t) is periodic or not giving reasons. If it is periodic, find the corresponding period.
       X (t) = 2 cos 100 π t + 5 sin 50 t
    b) for an LTI system with unit impulse response h(t)= e^{-2t} u(t) .determine the output to the input x(t)= e^{-t} u(t)

5. **Attempt any *one* part of the following:**   7 x 1 = 7
    a) Find the energy spectral density of f(t)= e^{-st} u(t)
    b) Find impulse response of system described by the equation 2y'(t) + 3y(t) = x(t)

6. **Attempt any *one* part of the following:**   7 x 1 = 7
    a) State and prove frequency shifting theorem of DTFT.
    b) Explain Fourier transform of single sided exponential pulse.

7. **Attempt any *one* part of the following:**   7 x 1 = 7
    a) Find Laplace transform of following signal and Draw ROC x(t) = cos (3t+ π/4) u(t)
    b) Determine z transform of : x(n) = sinω_0 n u(n)