Printed Pages : 1 **Roll No.** | | | | | | | | | | | **EEC404**

B. TECH.

THEORY EXAMINATION (SEM–IV) 2016-17

SIGNALS AND SYSTEMS

Time : 3 Hours ***Max. Marks : 100***

Note : *Be precise in your answer. In case of numerical problem assume data wherever not provided.*

SECTION-A

1 Explain the following: **(10×2=20)**

a) What are the different types of Signals?

b) Define inverse FT.

c) Explain damping ratio.

d) What is first order system? Explain.

e) Explain discrete-time system.

f) Give the significance of rectangular pulse.

g) Define continuous time system.

h) What is unit ramp?

i) Define transformation.

j) Explain one-sided Z-transform.

SECTION-B

2 Attempt any five of the following: **(10×5=50)**

a) Discuss the unit impulse and unit step signals with suitable example.

b) Write a note on s-plane to z-plane mapping with appropriate example.

c) Explain the causality and stability with reference to a system with example.

d) Sketch the discrete time signal $x(n) = 2^{-n}$ for $-3<n<3$ and obtain $Y(n) = x(n) + u(-n + 2)$.

e) Illustrate the relation between Laplace Transform and Fourier Transform with suitable example.

f) State Parseval's theorem. Illustrate it with prper example.

g) Solve the differential equation using z-Transform method $x(n-2) - 9x(n-1) + 18x(n) = 0$. Initial conditions are $x(-1) = 1$, $x(-2) = 9$.

h) Describe the convolution integral with the help of an example.

SECTION-C

Attempt any two of the following: **(15×2=30)**

3 What do you understand by energy spectral density of the signal? Explain. Find the auto-correlation function and the energy spectral density of the signal $x(t) = e^{-t} u(t)$.

4 What do understand by the one-sided Laplace Transform of signal? Explain. Also find the Laplace Transform of the signal $x(t) = e^{-3t} u(t) + e^{-2t} u(t)$ and find ROC.

5 Write detailed note on the following:

a. DTFT.

b. First order CT low pass filter.