Roll No. .....

24151

B. Tech 4th Semester (Electronics & Communication Engg.)

Examination – May, 2013

SIGNALS AND SYSTEMS (Common With E. I. E. Branch)

Paper : EE-228-F

Time : Three hours] *[Maximum Marks : 100*

Before answering the question, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt a total of *five* questions. Question No. 1 is *compulsory*. Attempt at least *one* question from each Section.

1. (a) What do you mean by lumped and distributed parameter systems. 2

(b) Write the mathematical expression for unit pulse function. 2

(c) What is Fourier transform ? Also find the Fourier transform of impulse function. 2

(d) State and prove the time shifting property of FT. 2

(e) Write a short note on poles and zeros. 2

(f) Explain in detail rise time of CT system functions. 4

(g) What do you mean by ROC ? Find ROC for infinite duration Causal & Anticausal signals. 4

(h) What do you mean by one side LT ? 2

SECTION – I

2. (a) Sketch the following signals : 10

(i) $x(t) = \cos(20\pi t - 5\pi)$

(ii) $x(t) = r(-0.5t + 2)$

(b) Explain with example linear and nonlinear systems. Also find out whether the system is linear on not . $\frac{dy(t)}{dt} + y(t) + 4 = x(t)$. 10

3. (a) What do you mean by BIBO stable system ? Also explain the properties of transformation of independent variable. 10

(b) Explain unit step and unit ram functions and what is the relationship between them ? 10

SECTION – II

4. (a) State and prove the Rayleigh's energy theorem. 10

(b) Explain frequency convolution of Fourier transform in detail. 10

5. (a) Find out the relationship of DFT to the z-transform. 10

(b) What do you mean by circular correlation of DFT ? 10

SECTION – III

6. Explain and find out the expressions for first and second order systems. 20

7. What are the various discrete time system functions ? Illustrate with block diagram. Also discuss the continuous time system. 20

SECTION – IV

8. (a) Find the Laplace transform of following : 10

(i) $\sin h\, w_0 t$,

(ii) $\& (t) = \left[\frac{1 - e^t}{t}\right]$.

(b) State and prove the convolutional integral. 10

9. (a) What do you mean by bilateral z - transform ? Also find the z-transform of following : 10

(a) $S(k)$

(b) $k_a k$

(b) State and prove the shifting property of z-transform. 10
