Roll No. .....

24151

B. Tech. 4th Semester (ECE) Examination – May, 2023

SIGNALS & SYSTEMS

Paper : EE-228-F

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

Before answering the questions, 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 : Question No. 1 is ***compulsory***. Answer any ***one*** question from each of the remaining ***four*** Units. All questions carry equal marks.

1. Explain the following : $5 \times 4 = 20$

   (a) What do you understand by periodicity ?

   (b) What are the conditions for existence of Fourier transform ?

   (c) What is ROC and what is its significance ?

(d) What do you understand by Parseval's Energy Theorem ?

(e) What are one dimensional and multi dimensional signals ?

UNIT – I

2. Explain following with suitable mathematical expressions. 20

(a) Deterministic and Random signal

(b) Even and Odd signal

(c) Energy and Power signal

(d) Continuous and Discrete signal

3. (a) What do you understand by unit impulse function ? Write various properties of it. 10

(b) What is time shifting, time scaling and folding operation on independent variable i.e "t" ? Explain with suitable example. 10

UNIT – II

4. What is Fourier transform ? Write and explain various property of Fourier transform with suitable mathematical derivation. 20

5. (a) Write comparison between Fourier transform and Discrete time Fourier transform. 10

(b) Write and drive any *five* properties of DTFT. 10

UNIT – III

6. Explain first order and second order discrete time system with suitable diagram and mathematical expressions. 20

7. What is Laplace transform, its ROC and pole zero plot ? Explain with suitable example. 20

UNIT – IV

8. What do you understand by one sided and bilateral laplace transform ? Write and explain various properties of Laplace transform. 20

9. (a) What is Z-Transform ? Compute Z-transform of unit impulse and unit step function ? 10

   (b) State and Prove initial and final value theorem of Z-transform. 10