Roll No. .....

Total Pages : 02

015602

May 2024

B.Tech. (ENC) (Sixth Semester)

Digital Signal Processing (ECC-04)

Time : 3 *Hours*] [*Maximum Marks* : 75

Note : It is compulsory to answer all the questions (1.5 marks each) of Part A in short. Answer any *four* questions from Part B in detail. Different sub-parts of a question are to be attempted adjacent to each other.

Part A

1. (a) Define unit sample sequence. **1.5**
   (b) Define unit step signal. **1.5**
   (c) Define Energy signals. **1.5**
   (d) What are non-linear systems ? **1.5**
   (e) Define Causal Systems. **1.5**
   (f) Define Recursive Systems. **1.5**
   (g) What do you mean by convolution ? **1.5**
   (h) Define initial value theorem. **1.5**
   (i) Define filter properties. **1.5**
   (j) Define Discrete Fourier Transforms. **1.5**

Part B

2. (a) Determine the z transform of the signal : **10**

$$x(n) = n\ a^n\ u(n)$$

   (b) Write steps of FFT algorithms. **5**

3. (a) Write characteristics of LTI Systems. **5**
   (b) How will you reconstruct analog signals from digital signals ? Explain in detail. **10**

4. Illustrate the designing methods for FIR digital filters by using window techniques. **15**

5. (a) Differentiate between band pass and band stop filters. **5**
   (b) Give design steps for digital IIR filters by using Butterworth techniques. **10**

6. (a) Explain the effect of Finite register length in FIR filter design. **10**
   (b) Explain multirate signal processing. **5**

7. Differentiate between parametric and non-parametric spectral estimation. How are these implemented ? What are their applications ? **15**