Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Electronics Engineering) (2012 Onwards) (Sem.–6)

DIGITAL SIGNAL PROCESSING

Subject Code : BTEEE-601

Paper ID : [72835]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

a. What do you mean by digital signal processing? Explain.

b. Differentiate between energy signals and power signals.

c. Define z transform and explain the importance of ROC in Z transform.

d. Write down the characteristics of one sided z-transform.

e. Compare the computational requirements of DFT and FFT algorithms.

f. Define DFT and discuss its significance.

g. What is the significance of convolution? Explain.

h. Write down the various advantages of DSP processors.

i. Discuss the advantages of digital filters.

j. Comment upon the errors resulting from rounding and truncation.

SECTION-B

2. Explain the basic elements of DSP system. Also explain the various applications of digital signal processing.

3. Discuss in detail various properties of z-transform.

4. Compute the 8-point DFT of x(n) = 2n $0 \leq n \leq 7$ using radix-2 Decimation in frequency FFT algorithm with the help of neat sketch.

5. Given a three stage lattice filter with coefficients K_1=0.25, K_2=0.5, K_3=0.33, Determine the FIR filter coefficients for the direct form structure.

6. Discuss impulse invariance method used for the design of digital IIR filters.

SECTION-C

7. Determine the inverse Z transform of X (z) = $\frac{1}{1-1.5z^{-1}+0.5z^{-2}}$ If

   a) ROC : |z| > 1

   b) ROC : |z|< 0.5

   c) ROC: 0.5 <|z|<1

8. Explain the following :

   a) Advantages and disadvantages of digital signal processing.

   b) Manipulation of discrete time signals.

9. What are the desirable features of DSP processors? Discuss different types of DSP architectures. Explain in detail the internal architecture of ADSP processors.