Roll No. | | | | | | | | | | | | | Total No. of Pages :02

Total No. of Questions : 09

B.Tech.(EE)(2011 Onwards Elective-II)

B.Tech. (Electrical & Electronics) (2011 & 2012 Batch Elective-II)

(Sem.–7,8)

DIGITAL SIGNAL PROCESSING

Subject Code : BTEE-804C

M.Code : 71938

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION 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. Write briefly :

A What do you mean by signal processing? Explain.

B Discuss the significance of DSP.

C What do you mean by difference equation? Explain.

D What is region of convergence? Explain.

E What do you mean by stop band attenuation? Explain.

F Write down the various Dirichlet conditions.

G What do you mean by frequency transformation? Explain.

H What is DFT? Discuss its significance.

I Compare FIR and IIR filters.

J What do you mean by aliasing? Explain.

SECTION-B

2. With the help of an example explain the concept of frequency in continuous time and discrete time signal.

3. Find the Z-transform of the signal $x(n) = \begin{cases} (1/3)^n, n \geq 0 \\ (1/2)^{-n}, n<0 \end{cases}$

4. Explain (in detail) the elementary discrete time signals and discrete time systems.

5. Determine the Fourier transform of the signal

$$x(n) = a^{|n|}, \quad -1 < a < 1$$

6. Compute the 4-point DFT of the signal $x(n) = \{2,4,6,8\}$.

SECTION-C

7. Obtain the coefficient of an FIR low pass filter to meet the specifications given below using the window method:

Passband edge frequency	1.5 kHz
Transition width	0.5 kHz
Stopband attenuation	>50 dB
Sampling frequency	8 kHz

8. Discuss the various properties of Z transform in detail.

9. Explain the following :

   A. Correlation of Discrete time signals

   B. Linear filtering method based on DFT

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.