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

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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.