**Enrollment No: _____ Exam Seat No:_____**

# C.U.SHAH UNIVERSITY

## Winter Examination-2015

**Subject Name:Digital Signal Processing**

**Subject Code:4TE05DSP1** **Branch: B.Tech (EC)**

**Semester: 5 Date : 11/12/2015 Time :2:30 To 5:30 Marks :70**

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

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**Q-1** **Attempt the following questions:** **(14)**

**a)** Define Static and dynamic systems.
**b)** Define Causal and Non causal systems.
**c)** Define Time Variant and Time Invariant systems.
**d)** Explain stable and unstable systems.
**e)** What is meant by signal?
**f)** Explain linear and nonlinear systems.
**g)** State Sampling theorem.
**h)** Explain periodic and non periodic signals.
**i)** Explain odd and even signals.
**j)** Define Unit step Signal.
**k)** Explain continuous time Signal and Discrete Time Signals.
**l)** What is meant by causal sequence?
**m)** Define system.
**n)** Explain energy and power signals.

**Attempt any four questions from Q-2 to Q-8**

**Q-2** **Attempt all questions** **(14)**

**(a)** Explain the significance of R.O.C. of Z transform. Prove the differentiation property of Z transform.
**(b)** Find Out Linear Convolution of two SequencesX(n)=[1,1,1,1] & h(n)=[1,1,1,1]

**Q-3** **Attempt all questions** **(14)**

**(a)** Determine the z-transform of the sequence given by X(n) =[1,2,4,5,0,7]
**(b)** Explain Linearity and Time Reversal Properties of Z Transform.

**Q-4** **Attempt all questions** **(14)**

**(a)** Obtain the inverse z transform of the given signal using the partial fractional

method. $X(Z) = \dfrac{1 - Z^{-1}/2}{1 + (3Z^{-1}/4) + Z^{-2}/8}$ , $|Z| > 1/2$

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|---|---|---|
| **(b)** | Explain Stability and causality of LTI System. | **4** |
| **(c)** | Explain the basic elements of DSP using necessary diagram. | **3** |

**Q-5** **Attempt all questions** **(14)**

**(a)** Given X(n) = $2^n$ and N=8.Find DFT using DIT FFT algorithm.

**(b)** State various properties of DFT.

**Q-6** **Attempt all questions** **(14)**

**(a)** Compute 8 Point DFT of X(n) =[1,2,1,2] and sketch magnitude plot of thesignal.

**(b)** For the given two 4 point sequence h[n] whereh(n)={0,1,2,3}.Calculate 4-point DFT of h[n].

**Q-7** **Attempt all questions** **(14)**

**(a)** State advantages of DSP over ASP. **3**

**(b)** State all the applications of DSP. **3**

**(c)** Write short notes on: **8**

- Effects of Co-efficient quantization and
- Effect of round off noise for digital filters

**Q-8** **Attempt all questions** **(14)**

**(a)** Using Graph Based Method ,obtain a 5 point circular convolution of two signal:X(n)=$(1.5)^n$ $0 \le n \le 2$, h(n)=2n-3, $0 \le n \le 3$. **6**

**(b)** Compare : **8**

- FIR and IIR Filter.
- RISC and CISC