Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – SUMMER • 2014

Subject Code: 150303 **Date: 19-06-2014**

Subject Name: Signals and Systems

Time: 10.30 am - 01.00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q-1 **(A)** What is size of a signal? Determine the power of the signal **x(t)= C cos (wt+θ)**. **7**

(B) Enlist and explain standard signal models. **7**

Q-2 **(A)** Enlist classifications of systems and explain them in brief. **7**

(B) Draw and explain the block diagram of digital signal processing. **7**

OR

(B) Explain the advantages of digital signal processing. **7**

Q-3 **(A)** Find the inverse Z-transform of: **7**

$$X(Z) = \frac{-z\,(z+0.4)}{(z-0.8)\,(z-2)}$$

(B) Enlist and explain the properties of DFT. **7**

OR

Q-3 **(A)** What is z-transform? What is R.O.C. and explain its significance. Also determine the R.O.C. of following signals. **7**

i.	**δ (n)**	**iv.**	**$x(n)= a^n u(n)$**
ii.	**δ (n-N)**	**v.**	**$x(n) = a^n u(n) + b^n u(-n-1)$**
iii.	**x(n) = u (n)+u (-n-1)**	**vi.**	**$x(n) = a^n u(n) + b^n u(n)$**

(B) Find out the Z-transform of following: **7**

$$X(n) = a^n u(n)$$

Q-4 **(A)** Write a short note on: The sampling theorem. **7**

(B) Explain DIT FFT algorithm. **7**

OR

(A) Determine impulase response h(n) for the system described by following equation. **7**

y(n)- 3 y(n- 1) - 4y (n-2) : x(n)+2x(n- 1)

(B) Explain DIF FFT algorithm. **7**

Q-5 **(A)** Enlist and explain the properties of Fourier transform. **7**

(B) Compute the four point DFT of sequence **x(n)={,1,2,3}, x(0)=0**. **7**

OR

Q-5 **(A)** Compute the Fourier transform **of $x(n)=(1)^n u(n)$**. Also give the applications of Fourier transform. **7**

(B) What is signal reconstruction? Which are the difficulties faced during signal reconstruction? **7**

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