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 **$x(t)= C \cos(wt+\theta)$**.	**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: $$X(Z) = \frac{-z\,(z+0.4)}{(z-0.8)\,(z-2)}$$	**7**
	(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. **i.** $\delta(n)$ **iv.** $x(n)= a^n u(n)$ **ii.** $\delta(n-N)$ **v.** $x(n) = a^n u(n) + b^n u(-n-1)$ **iii.** $x(n) = u(n)+u(-n-1)$ **vi.** $x(n) = a^n u(n) + b^n u(n)$	**7**
	(B)	Find out the Z-transform of following: $$X(n) = a^n u(n)$$	**7**
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. $$y(n)- 3\,y(n-1) - 4y(n-2) : x(n)+2x(n-1)$$	**7**
	(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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