Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – WINTER • 2013

Subject code: 714204N **Date: 06-01-2014**

Subject Name: Advance DSP System & Architecture

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 mark.**

Q.1	**(a)**	List properties of LTI Systems and describe its conditions.	**07**
	(b)	Define: 1) Nyquist rate 2) ROC of Z –transform 3) Parseval's relation for Fourier transform 4) Gibbs Phenomenon 5) All pass filter 6) minimum phase system 7) FFT	**07**
Q.2	**(a)**	Discuss frequency response of LTI system.	**07**
	(b)	Sketch the magnitude and phase response of following LTI system. H(n) = {1/2,1/2}	**07**
		OR	
	(b)	Compare various windows used for FIR filter design.	**07**
Q.3	**(a)**	List Properties of Z-Transform and prove two of them.	**07**
	(b)	Find Z- Transform of : a) h[n] = {1/3,1/3,/1/3} b) h{[n] = δ[n+k] , k>0	**07**
		OR	
Q.3	**(a)**	List Properties of DFT and explain two of them in brief.	**07**
	(b)	Find IDFT of {2, 1+j, 0, 1-j}.	**07**
Q.4	**(a)**	A filter is described by y[n]-(3/4) y[n-1]+(1/8) y[n-2] = x[n] + (1/2) x[n-1] Draw a) Direct form I, b) Direct form II realization.	**07**
	(b)	Explain radix 4 decimation in time FFT algorithm.	**07**
		OR	
Q.4	**(a)**	Perform circular convolution of $X_1[n] = \{1,3,5,3\}$ and $X_2[n] = \{2,3,1,1\}$	**07**
	(b)	For a 9 tap FIR filter having zeros at z1 = -0.5, z2 = 0.3 + j0.5, z3 = -(1/2) + j √(3/2). Determine the locations of other zeros and find out the transfer function.	**07**
Q.5	**(a)**	Explain interrupts of 'C6X processor.	**07**
	(b)	Explain the code generation steps in code composer studio.	**07**
		OR	
Q.5	**(a)**	Compare the following 1)DSP Processor and Microprocessor 2) Von Nu Neumann Architecture and Harvard Architecture	**07**
	(b)	Write in Brief: (Any two) 1) Decimation in time FFT algorithms 2)Impulse invariance method for IIR filter Design 3)Application of DSP	**07**

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