Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER–I(New course)• EXAMINATION – WINTER- 2015

Subject Code: 2714107 **Date: 02/01/2016**

Subject Name: Signal Analysis and Transform

Time:2:30 pm to 5:00 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)	Determine the following systems are Time Variant or Time Invariant. [1] $Y[n] = X[n] + X[n-1]$ [2] $Y[n] = nX[n]$	07
	(b)	[1] State and Prove: "Scaling Property" of Z-Transform. [2] List the Properties of DFT and explain any one.	07
Q.2	(a)	Calculate the DFT of a sequence: $X[n] = \{\underset{\uparrow}{1}, 1, 0, 0\}$	07
	(b)	Find the Inverse Z-Transform of the following using Partial Fraction Expansion (PEF) Method. $X[z] = 1/(Z-1)(Z-3)$	07
		OR	
	(b)	What is FFT algorithm? Explain "Decimation in Frequency (DIF) Fast Fourier Transform (FFT) algorithm with necessary equations.	07
Q.3	(a)	What is Transform? With Necessary equations explain "Discrete Cosine Transform" fundamentally.	07
	(b)	Write Short Note on: Multi Wavelet.	07
		OR	
Q.3	(a)	Explain "Fast Wavelet Transform" with necessary equations.	07
	(b)	Write Short Note on: Walsh Transform.	07
Q.4	(a)	[i] Write Note on: Region of Convergence(ROC) of Z-Transform. [ii] Find Z-Transform for : $X[n] = a^n u[n]$ using Scaling Property.	07
	(b)	Write Short Note on: Linear Filtering Approach for computation of the DFT.	07
		OR	
Q.4	(a)	Write Short Note on: Signal Distortion over a Communication Channel	07
	(b)	Define the terms: (1) Correlations of Signal (2) Orthogonal Signal Set and (3) Power Spectral Density	07
Q.5	(a)	Write Short Note on : Radon Transform	07
	(b)	Discuss and Compare: Continuous Wavelet Transform and Discrete Wavelet Transform briefly.	07
		OR	
Q.5	(a)	What is Size of Signal? Explain Classification of signal Fundamentally.	07
	(b)	Write Short Note on : Eigen Values and Eigen Vectors	07

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