Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2013

Subject code: 1710422 **Date: 05-06-2013**

Subject Name: Digital Signal Processing & Application

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) Define the Z transform and Inverse Z transform with the properties of ROC. **07**

(b) Explain the properties of Z transform **07**

Q.2 (a) A system has an impulse response h (n) = {1, 2, 3} and output response y (n) = {1,1,2,-1,3}. Determine the input sequence x (n) using Z transform. **07**

(b) Explain Sampling of signals by impulse functions. **07**

OR

(b) Compute the convolution y (n) = x (n) * h (n) of the signals

x (n) = {1,1, 0 ,1,1,} and h(n) = {1,2,-3,4} **07**

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Q.3 (a) Discuss the properties of Discrete Fourier Transform. **07**

(b) Derive the DFT of the sample data sequence x(n) = {1,1,2,2,3,3} and compute the Corresponding amplitude and phase spectrum. **07**

OR

Q.3 (a) Find the inverse DFT of X (k) = {3,(2+j),1,(2-j)} **07**

(b) Explain Decimation-In-Time Algorithm. **07**

Q.4 (a) Write notes on fixed point and floating point DSP. **07**

(b) Given $x(n) = 2^n$ and N = 8, find X (k) using DIT FFT algorithm. **07**

OR

Q.4 (a) Explain Decimation-In-Frequency Algorithm. **07**

(b) Given x (n) = n+1 and N = 8, find X (k) using DIF FFT algorithm **07**

Q.5 (a) Explain Harvard Architecture. **07**

(b) Explain design of FIR filters by windowing and list the properties of commonly Used windows. **07**

OR

Q.5 (a) Discuss the applications of DSP. **07**

(b) List the advantages and disadvantages of Digital Signal Processing over Analog Signal Processing. **07**

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