Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – VI EXAMINATION – WINTER 2015

Subject Code:160305 **Date:10/12/ 2015**

Subject Name: Biomedical Signal Processing

Time:2:30pm to 5:00pm **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)**	Explain Digital Signal Processing System with block diagram.	**07**
	(b)	Write advantages and limitations of Digital Signal Processing.	**07**
Q.2	**(a)**	Find the convolution of the signals x(n)={1,2,$\underset{\uparrow}{1}$,1}, h(n) = δ(n)- δ(n-1)+ δ(n-2)- δ(n-3)	**07**
	(b)	Obtain the linear convolution of two sequences defined as, x(n)= u(n)-u(n-3), h(n)= u(n-1)+u(n-2)-u(n-4)-u(n-5) using circular convolution.	**07**
		OR	
	(b)	Compute the circular convolution of following sequences and compare the results with linear convolution. X(n)={1,1,1,1,-1,-1,-1,-1} and h(n)={0,1,2,3,4,3,2,1}	**07**
Q.3	**(a)**	Explain direct form I and II realization of an IIR Systems.	**07**
	(b)	Obtain the cascade realization of system function H (z) = $(1+2z^{-1}-z^{-2})$ $(1+z^{-1}- z^{-2})$.	**07**
		OR	
Q.3	**(a)**	Explain frequency response of LTI system with one example.	**07**
	(b)	Write Properties of Discrete Fourier Series.	**07**
Q.4	**(a)**	Explain Sampling of the Fourier Transform. Write any three properties of DFT.	**07**
	(b)	Determine 4-point DFT of a sequence, x(n)=u(n)-u(n-2).	**07**
		OR	
Q.4	**(a)**	Explain Decimation-in-Time FFT Algorithm.	**07**
	(b)	Determine the response of FIR filter using DFT if : x(n)={1,2} and h(n)={1,1}	**07**
Q.5	**(a)**	Explain FIR filters design using Hamming and Hanning Window methods.	**07**
	(b)	Explain the method of ECG signal analysis.	**07**
		OR	
Q.5	**(a)**	Explain any one method to design IIR filters with example.	**07**
	(b)	Explain the architecture of DSP processor.	**07**

****