Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE SEMESTER– VI (OLD) • EXAMINATION – WINTER- 2017

Subject Code: 160305 **Date:08/11/2017**

Subject Name: Biomedical Signal Processing

Time:02:30 PM TO 05:00 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)**	Explain the concepts of linearity, time invariance, stability and causality of LTI system.	**07**
	(b)	Explain different types of signals in detail.	**07**
Q.2	**(a)**	Explain Digital Signal Processing System with block diagram.	**07**
	(b)	Find the convolution of the signals $x(n) = \{-1, -2, 2, 1\}$, $h(n) = \delta(n) - \delta(n-1) + \delta(n-2) - \delta(n-3)$.	**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 $h(n) = \{0,2,2,4,2,3,2,1\}$	**07**
Q.3	**(a)**	Obtain the cascade realization of system function $H(z) = (1+5z^{-1}-z^{-2})(1+2z^{-1}-z^{-2})$.	**07**
	(b)	Explain Sampling of the Fourier Transform. Write any three properties of DFT.	**07**
		OR	
Q.3	**(a)**	Explain frequency response of LTI system with one example.	**07**
	(b)	Determine 4-point DFT of a sequence, $x(n) = u(n) - u(n-2)$.	**07**
Q.4	**(a)**	Explain Decimation-in-Time FFT Algorithm.	**07**
	(b)	Write sort note on: Goertzel Algorithm.	**07**
		OR	
Q.4	**(a)**	Explain FIR filters design using Hamming Window methods.	**07**
	(b)	Discuss the Bilinear transformation of IIR filter design.	**07**
Q.5	**(a)**	Explain the method of EOG signal analysis.	**07**
	(b)	Write short note on: All pass system.	**07**
		OR	
Q.5	**(a)**	Explain the method of ECG signal analysis.	**07**
	(b)	Explain the effect of round off noise in digital filters.	**07**

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