GUJARAT TECHNOLOGICAL UNIVERSITY ME SEMESTER – I (NEW) EXAMINATION – SUMMER 2017

Subject Code: 2713109Date:10/05/2Subject Name: Biomedical Signal processingTime: 02:30 p.m. to 05:00 p.m.Time: 02:30 p.m. to 05:00 p.m.Total MarksInstructions:Total Marks			5/2017	
			70	
	1. 2. 3.	Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks.		
Q.1	(a)	Write a short note on morphological analysis of ECG wave including diseases	07	
	(b)	Explain steps of the Pan-Tompkins algorithm for QRS detection with necessary equations.	07	
Q.2	(a)	Discuss the concepts of synchronized averaging? Derive necessary equation to prove that synchronized averaging improve SNP	07	
	(b)	Explain moving average filter with their signal flow graph.	07	
	(b)	Explain indicators used to measures waveform complexity or activity that may be used to analyze the extent of variability.	07	
Q.3	(a)	Enlist and Explain three common types of artifact's sources in a biomedical instrument.	07	
	(b)	Explain concepts of adaptive filters for removal of interference and also enlist their biomedical applications.	07	
		OR		
Q.3	(a) (b)	Explain concept of curve fitting to biomedical database with example. Explain concepts of Neural network learning with necessary schematic.	07 07	
Q.4	(a) (b)	Discuss application of Neural networks for pattern classifications. Write a short note on Parametric system modeling.	07 07	
Q.4	(a) (b)	Explain following terms Power Spectral Density autocorrelation function Spectral power ratios Write a conceptual note on detection of dicrotic notch in arterial pressure	07 07	
		signals.		
Q.5	(a) (b)	Explain time domain technique to remove base-line drift in the ECG signal. Draw the block diagram of Wiener filter and explain concept of error estimation and minimization.	07 07	
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Q.5	(a)	Explain common difficulties encountered in biomedical signal acquisition and analysis.	07	
	(b)	 Distinguish between open-loop and close loop monitoring of a patient. Give two-examples that require the application of electronics instruments and/or computers in EEG analysis. 	07	
