Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2018

Subject Code: 2171102 **Date: 06/12/2018**

Subject Name: Biomedical Instrumentation

Time: 10:30 AM TO 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)**	Discuss Nervous system.	**03**
	(b)	Discuss ECG signal with various points of voltage level.	**04**
	(c)	Explain the generalized medical instrumentation system in detail.	**07**
Q.2	**(a)**	Discuss the body cells in brief.	**03**
	(b)	Discuss EEG bands in detail.	**04**
	(c)	Explain Compensation Techniques in detail.	**07**
		OR	
	(c)	Explain Active state of excitable cells.	**07**
Q.3	**(a)**	What are the sources of Noise?	**03**
	(b)	Explain noise reduction by signal averaging in biomedical signals.	**04**
	(c)	Explain Internal Electrodes in detail.	**07**
		OR	
Q.3	**(a)**	Define following terms: Noise factor, Noise figure, and Noise temperature	**03**
	(b)	An EEG system processes a 5 microvolt signal in the presence of a 100 microvolt random noise level. Calculate the unprocessed SNR, the processes SNR for 400 repetition of the signal.	**04**
	(c)	Explain body surface electrodes in detail.	**07**
Q.4	**(a)**	Discuss: Cerebral angiography	**03**
	(b)	Enlist the typical EEG system faults.	**04**
	(c)	Explain the standard 12 lead system for ECG measurements in detail.	**07**
		OR	
Q.4	**(a)**	Discuss: Cranial x-rays	**03**
	(b)	Discuss the ECG system faults.	**04**
	(c)	Explain the standard 10-20 system for EEG measurements in detail.	**07**
Q.5	**(a)**	Compare perfectly Polarizable and Nonpolarizable Electrodes.	**03**
	(b)	Discuss basic approaches to protect against shock.	**04**
	(c)	Explain Macroshock Hazards in detail.	**07**
		OR	
Q.5	**(a)**	Discuss various types of Noise.	**03**
	(b)	Enlist various important susceptibility parameters for safety.	**04**
	(c)	Explain Microshock Hazards in detail.	**07**

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