Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– III (New) EXAMINATION – WINTER 2019

Subject Code: 2130303 **Date: 28/11/2019**

Subject Name: Bioelectric Potential and Measurement Techniques

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.**

			MARKS
Q.1	**(a)**	What are the Sources of Bioelectric potentials?	**03**
	(b)	Define: Action potential, Cardiac output	**04**
	(c)	Discuss briefly the problems encountered in measuring Living system.	**07**
Q.2	**(a)**	Define: (1) Accuracy, (ii) Precision, (iii) Sensitivity	**03**
	(b)	State & Interpret the force balance equation for transport processes.	**04**
	(c)	Explain the measurement of Electrocardiograph with Einthoven triangle.	**07**
		OR	
	(c)	Explain any three type of active transducer.	**07**
Q.3	**(a)**	Classify various types of surface electrodes.	**03**
	(b)	Discuss about transport process through cell membrane.	**04**
	(c)	What do you mean by half-cell potential? Describe the method to measure half-cell potential with diagram.	**07**
		OR	
Q.3	**(a)**	Derive gauge factor formula of strain gauge type displacement transducer.	**03**
	(b)	Explain heart rate measurement technique.	**04**
	(c)	What is ECG? Write a short note on generation of ECG.	**07**
Q.4	**(a)**	Describe the characteristics of EEG in brief.	**03**
	(b)	Write a technical note on Diathermy.	**04**
	(c)	Explain Cardiac Cycle in detail.	**07**
		OR	
Q.4	**(a)**	Describe montage in EEG measurement?	**03**
	(b)	Differentiate the applications of Auditory implants and hearing aids.	**04**
	(c)	Write short note on multi-parameter monitoring device.	**07**
Q.5	**(a)**	Write a short note on Functional Electrical Stimulation.	**03**
	(b)	Write down the difference between Nerve and Muscle Stimulators.	**04**
	(c)	Explain schematic diagram of dc defibrillator.	**07**
		OR	
Q.5	**(a)**	Explain the need of defibrillator.	**03**
	(b)	Write short note on Pacemaker.	**04**
	(c)	Describe the design and applications of myoelectric arm.	**07**

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