Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI(NEW) – EXAMINATION – SUMMER 2019

Subject Code:2161712 Date:21/05/2019

Subject Name:Bio-Potential 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.**

			MARKS
Q.1	**(a)**	Briefly explain action potential and resting potential.	**03**
	(b)	With proper diagram explain generation of bio potential from cell.	**04**
	(c)	With suitable diagram explain the concept of medical instrumentation system in detail.	**07**
Q.2	**(a)**	Explain GHK equation.	**03**
	(b)	What are noise and measurement errors in bio signal processing.	**04**
	(c)	Explain various types of electrodes used in ECG measurement.	**07**
		OR	
	(c)	Explain various types of electrodes used in EEG measurement	**07**
Q.3	**(a)**	Briefly discuss commercial medical instrumentation development process.	**03**
	(b)	Explain electrode skin interface and motion artifacts.	**04**
	(c)	With suitable diagram explain electro conduction system of the heart.	**07**
		OR	
Q.3	**(a)**	Briefly discuss noise reduction strategies for bio signal processing.	**03**
	(b)	Explain electrode arrays and micro electrodes.	**04**
	(c)	What is need of amplifier in bio medical instrumentation? Draw and explain Instrumentation Amplifier design for any medical instrumentation system.	**07**
Q.4	**(a)**	What is EEG telemetry? Briefly explain it.	**03**
	(b)	What is EEG? Explain its classification based on frequency range.	**04**
	(c)	Explain ECG machine and its maintenance	**07**
		OR	
Q.4	**(a)**	Explain neuron and nervous system in brief.	**03**
	(b)	Explain structure and function of central nervous system	**04**
	(c)	With suitable diagram explain EEG system in detail.	**07**
Q.5	**(a)**	Explain physiological effects of electricity.	**03**
	(b)	Explain micro shock and macro shock hazards.	**04**
	(c)	Draw and explain chopper stabilized amplifier.	**07**
		OR	
Q.5	**(a)**	What is input guarding? Explain briefly.	**03**
	(b)	What is preamplifier for EEG system. Explain it in brief.	**04**
	(c)	Draw and explain isolation amplifier.	**07**

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