

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
