

GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER-VI (NEW) EXAMINATION – WINTER 2020

Subject Code:2161712**Date:01/02/2021****Subject Name:Bio-Potential Instrumentation****Time:02:00 PM TO 04:00 PM****Total Marks: 56****Instructions:**

1. Attempt any **FOUR** questions out of **EIGHT** questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Define bio-potential Instrumentation.	03
	(b) Which are the types of noises? Explain SNR.	04
	(c) Enlist the physiological systems in human body. Explain any one with neat diagram.	07
Q.2	(a) Briefly explain ECG, EEG & EMG.	03
	(b) Enlist different strategies for noise reduction.	04
	(c) Explain Anatomy & Physiology of the heart.	07
Q.3	(a) With proper diagram explain generation of bio potential from cell of a human body.	03
	(b) Draw and explain the isolation amplifier as a part of signal conditioning circuit.	04
	(c) Write short note on following. a. Instrumentation Amplifier b. Isolation amplifier	07
Q.4	(a) Define polarizable and non-polarizable electrodes	03
	(b) Explain Tactics and signals processing for improved sensing.	04
	(c) Write short note on following.: (a) ECG readout devices (b) Common ECG machine Faults & its troubleshooting	07
Q.5	(a) What is resting state?	03
	(b) Explain electro-conduction system of the heart.	04
	(c) Discuss Commercial Medical Instrumentation Development Process	07
Q.6	(a) What is micro shock and macro shock hazard?	03
	(b) Explain the classification of EEG signals as per frequency ranges.	04
	(c) Explain body surface electrodes with neat diagrams	07
Q.7	(a) Define Electroencephalography.	03
	(b) Briefly explain maintenance techniques for ECG machine	04
	(c) Explain lead system of ECG in detail.	07
Q.8	(a) Define Physiological effects of electricity.	03
	(b) Mention probable ECG faults and explain its trouble shooting.	04
	(c) What is EEG? Explain 10-20 electrode system	07
