Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – VI (NEW).EXAMINATION – WINTER 2016

Subject Code: 2161712 **Date: 26/10/2016**

Subject Name: Bio-Potential Instrumentation

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.**

Q.1	**(a)**	What do you mean by interfering and modifying input in biomedical measurement? Discuss different compensation techniques for them.	**07**
	(b)	What is bio-potential electrode? Explain different types of body-surface and internal electrodes.	**07**
Q.2	**(a)**	Discuss following terms in brief: i) Noise factor ii) IMRR (Isolation Mode Rejection Ratio) iii) Input guarding iv) G-H-K formulation v) Absolute refractory period vi) Volume conductor filed vii) Perfectly nonpolarizable electrode.	**07**
	(b)	Explain the blood circulatory system with neat diagram. Discuss any three problems related to it.	**07**
		OR	
	(b)	Explain electro-conduction system of the heart. Discuss any three problems related to it.	**07**
Q.3	**(a)**	What is the purpose of Isolation amplifier? Draw and discuss carrier type Isolation amplifier.	**07**
	(b)	Discuss in detail: i) Over-potential and different factors contributing to its generation ii) Active state potential	**07**
		OR	
Q.3	**(a)**	What is resting state? Explain the mechanism of generation of RMP (Resting Membrane Potential).	**07**
	(b)	What is the significance of chopper amplifier? Explain the chopper stabilized amplifier with neat diagram.	**07**
Q.4	**(a)**	Explain electrode-electrolyte and electrolyte-skin interface with its equivalent diagram.	**07**
	(b)	Discuss the significance of different types of lead systems in ECG with respect to einthoven's triangle. Draw block-diagram of typical clinical ECG machine and discuss each and every block.	**07**
		OR	
Q.4	**(a)**	Discuss different faults or problems frequently encounters in ECG machine in detail.	**07**
	(b)	Write a short note on: i) Electrode half cell potential ii) Network equivalent circuit of nerve/skeletal fibre.	**07**
Q.5	**(a)**	Explain EEG machine with 10-20 electrode placement system.	**07**
	(b)	Discuss physiological effects of electricity on human body.	**07**

OR

Q.5	**(a)**	Explain the structure and function of different types of nervous system.	**07**
	(b)	What is the difference between macroshock and microshock? Also discuss different sources contributing to generation of microshock.	**07**

****