Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– V • EXAMINATION – WINTER 2016

Subject Code:150302 **Date: 28/11/2016**
Subject Name: BIOMEDICAL TRANSDUCER
Time: 10:30AM – 01:00PM **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)**	Explain LVDT with necessary circuit diagram and graphs. How LVDT can be used for angular measurement?	**07**
	(b)	What are extra vascular and intra vascular pressure sensors? Mention difference between them.	**07**
Q.2	**(a)**	Explain piezoelectric transducer with necessary equations, mode of operation and merits and demerits of it. Show how it can work as pressure transducer.	**07**
	(b)	Give difference between RTD and Thermocouple. Also mention different types of thermocouples with their ranges.	**07**
		OR	
	(b)	Explain Geiger Muller counter. Give two applications of it.	**07**
Q.3	**(a)**	Explain microbial biosensor for ammonia and nitrogen dioxide with neat diagram.	**07**
	(b)	With help of neat diagram explain different types of electrodes used for ECG, EMG, EEG and EOG. Mention standards associated with it.	**07**
		OR	
Q.3	**(a)**	What are MEMS? Give two applications of MEMS in biomedical field.	**07**
	(b)	Explain enzyme based glucose sensor with neat diagram.	**07**
Q.4	**(a)**	Explain with neat diagram internal design of stethoscopes.	**07**
	(b)	Explain with neat diagram and equations electromagnetic blood flow transducer.	**07**
		OR	
Q.4	**(a)**	Explain photoconductive and photovoltaic transduction principle with their applications.	**07**
	(b)	Explain static and dynamic characteristics with reference to transducer.	**07**
Q.5	**(a)**	Explain with neat diagram strain gauge based displacement transducer.	**07**
	(b)	Explain with neat diagram transducer for respiration measurement.	**07**
		OR	
Q.5	**(a)**	Explain fiber optic sensor with diagram. Where it is used in biomedical field.	**07**
	(b)	Explain optical pyrometer with neat diagram.	**07**

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