Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – WINTER • 2014

Subject Code: 150302 **Date: 28-11-2014**

Subject Name: Biomedical Transducers

Time: 10.30 am - 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.**

Q.1	**(a)**	Explain How resistive potentiometric used for translational and angular displacement measurement and also derive necessary equations.	**07**
	(b)	Explain how various displacement transducers used for respiration sensing.	**07**
Q.2	**(a)**	Explain any two transducers for direct measurement of Blood pressure.	**07**
	(b)	Explain role of capacitive transducers in measurements. Also derive relationship between change in area with change in capacitance.	**07**
		OR	
	(b)	Explain any method for measurement of intraocular pressure.	**07**
Q.3	**(a)**	Explain working of Microbial biosensor for ammonia and nitrogen dioxide.	**07**
	(b)	Explain SO_2 sensor of pulse oximeter with necessary schematic diagram.	**07**
		OR	
Q.3	**(a)**	Write a short note on Blood PO_2 sensors.	**07**
	(b)	Explain working of GM counter for nuclear Radiation with necessary diagram.	**07**
Q.4	**(a)**	Explain working of Air flow transducer for Fleish pneumotachometer.	**07**
	(b)	Explain electrical design consideration for measurements.	**07**
		OR	
Q.4	**(a)**	Derive the relationship between blood flow velocity and transient time in Ultrasonic flow sensor.	**07**
	(b)	Explain used of thermistor to measure cardiac output and nasal air flow.	**07**
Q.5	**(a)**	Explain Electrode circuit model.	**07**
	(b)	Explain half-cell potential, polarizable electrodes and non- polarizable electrodes with necessary figure.	**07**
		OR	
Q.5	**(a)**	Write a short note on Smart sensors.	**07**
	(b)	Give types of Micro electrodes with schematic diagram. Explain the electrical properties of Micro electrodes.	**07**

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