Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – WINTER 2013

Subject Code: 150302 Date: 29-11-2013

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)**	Enlist and explain performance characteristics of Transducers.	**07**
	(b)	Explain types, construction and temperature compensation of the strain gauge.	**07**
Q.2	**(a)**	Explain used of Thermister for the measurement of cardiac output and nasal air flow.	**07**
	(b)	Explain characteristics of RTD metals, construction and three & four wire lead arrangements.	**07**
		OR	
	(b)	Explain capacitive and reluctive transductions principle.	**07**
Q.3	**(a)**	Derive the piezo-crystals output equations. Give their modes of operation, merits and demerits.	**07**
	(b)	Explain working of ultrasonic blood flow meter with necessary equations.	**07**
		OR	
Q.3	**(a)**	Explain working of Electromagnetic Blood flow meter with schematic diagram.	**07**
	(b)	Write a short note on Tonometry.	**07**
Q.4	**(a)**	Explain working of Nuclear radiation transducers.	**07**
	(b)	Explain translational and angular displacement measurement technique.	**07**
		OR	
Q.4	**(a)**	Give brief idea about Electrode-Electrolyte interface, half cell potential, motion artifacts and polarization.	**07**
	(b)	Explain Microbial biosensor for ammonia and nitrogen dioxide.	**07**
Q.5	**(a)**	Explain construction and working of Transcutaneous PO2 sensor.	**07**
	(b)	Explain construction of various internal and microelectrodes.	**07**
		OR	
Q.5	**(a)**	Explain construction and working of Polarographic clark PO2 sensor.	**07**
	(b)	Write a short note on Nano sensors for Biomedical appications.	**07**

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