Seat No.:	Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V EXAMINATION - WINTER 2015

Su	bject	Code: 150302 Date:17/12/2015	
	•	Name: Biomedical Transducers 0:30am to 1:00pm Total Marks: 70	
Ins	1. 2. 3.	Attempt all questions. Make suitable assumptions wherever necessary.	
Q.1	(a) (b)	Explain static and dynamic performance characteristic of transducers. Compare three most commonly used temperature transducers with respect to their principle of transduction, material used, temperature range, merits and Demerits.	07 07
Q.2	(a)	Describe the principle of operation and application of an applanation Tonometer.	07
	(b)	Explain a quarter bridge circuit using a strain gauge to produce an output Voltage in response to applied strain. What is the significance of temperature Compensation in such measurement and how can this be accomplished? OR	07
	(b)	What is Nuclear Radiation? Explain working of GM Counter with neat Diagram.	07
Q.3	(a)	How is an electrode different from a transducer? Draw the equivalent circuit of a twin electrode. Explain the terms: half cell potential, electrode polarization and non-polarizable electrode.	07
	(b)	Explain electrical Properties of Microelectrodes along with its Methods of use. OR	07
Q.3	(a) (b)	Explain Enzyme based Glucose Sensor Write a short note on: (1) Polarographic Clark PO ₂ Sensor (2) Transcutaneous PO ₂ Sensor.	07 07
Q.4	(a)	Explain the working of an electromagnetic blood flow meter with the help of a neat diagram. Discuss any four sources of error in such measurement.	07
	(b)	Explain Microbial biosensor for ammonia and nitrogen dioxide. OR	07
Q.4	(a) (b)	Explain capacitive and reluctive transductions principle. Write a short note on: i)Fiber optic transducer ii) Elastoresistive transducer	07 07
Q.5	(a) (b)	Explain Air flow transducer for Fleish pneumotachometer. Explain non-contact type infrared thermometry. OR	07 07
Q.5	(a) (b)	Explain Intraocular pressure measurement technique. Write a short note on role of Smart sensors in Biomedical Measurement.	07 07
