

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 SO₂ sensor of pulse oximeter with necessary schematic diagram. **07**
- OR**
- Q.3 (a)** Write a short note on Blood PO₂ 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**
