

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V (OLD) EXAMINATION – WINTER 2018

Subject Code:150302

Date: 30/11/2018

Subject Name: Biomedical Transducers

Time: 10:30 AM TO 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) Define transducers. Discuss their performance characteristics. **07**
(b) Explain photoconductive and photo voltaic transduction principle with their applications. **07**
- Q.2** (a) Write a technical note on types of strain Gauge, its construction and material selection criteria. **07**
(b) Explain working of LVDT with their construction, sensitivity and merits. **07**
- OR**
- (b) Derive equation of percentage change in capacitance due to variable separation. **07**
- Q.3** (a) Explain working of optical pyrometer with their limitations. **07**
(b) Explain the concept of extra vascular and intra vascular pressure sensors with applications. Also give list of sensors used for the same applications. **07**
- OR**
- Q.3** (a) Explain measurement of cardiac output with the help of thermistor with appropriate schematics. **07**
(b) Explain used of fiber optic pressure transducer for the intracranial pressure measurement in new borns. **07**
- Q.4** (a) State Hagen-poiseuille equation for laminar flow. Explain working of fleish pneumotachometer. **07**
(b) Explain any transducer that used for angular displacement measurement. **07**
- OR**
- Q.4** (a) Explain working principle of transducers used for nuclear Radiation measurement. **07**
(b) Explain construction and working of transcutaneous PO₂ sensor. **07**
- Q.5** (a) Write a short note on microbial biosensor for ammonia and nitrogen dioxide. **07**
(b) Explain structure and material selection of body surface biopotential recording electrodes. **07**
- OR**
- Q.5** (a) Explain electrode-skin interface and motion artifact. **07**
(b) Explain concept of smart sensors with block diagram. **07**
