

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-V • EXAMINATION – SUMMER • 2015**

**Subject Code: 150302****Date: 05/05/2015****Subject Name: Biomedical Transducers****Time: 02.30pm-05.00pm****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 Piezoelectric transducer with Piezoelectric materials and derive the output equation of Piezocrystal. **07**
- (b) Explain thermo emf transducer with cold junction compensation. **07**
- Q.2** (a) Give classification of transducers with their transduction principles & related examples. **07**
- (b) Explain working of optical pyrometer with schematic diagram. **07**
- OR**
- (b) Explain Electrical design consideration for the Generalized Instrumentation. **07**
- Q.3** (a) Write a technical note on temperature sensor Thermister. Explain used of thermister for cardiac output measurement. **07**
- (b) Write a short note on Tonometry. **07**
- OR**
- Q.3** (a) Explain Nuclear radiation transducers. **07**
- (b) Explain the construction and working of LVDT with the help of a neat diagram. Draw the input- output characteristics of LVDT. Mention its advantages and limitations. **07**
- Q.4** (a) Give the salient features and advantages of smart sensors. **07**
- (b) What do you understand by direct blood pressure measurement? Compare catheter tip and catheter end transducers. Enumerate any four transducers used for direct blood pressure measurement. **07**
- OR**
- Q.4** (a) Explain GM counter & Scintillation counter with diagram. **07**
- (b) Explain Electromagnetic blood flow meter. **07**
- Q.5** (a) Write short notes on: **07**
- 1.Fiber Optic Transducer
- 2.Elastoresistive Transducer
- (b) Explain ECG, EMG, and EEG Electrodes. **07**
- OR**
- Q.5** (a) Explain Palarographic Clark po<sub>2</sub> sensor & Transcutaneous po<sub>2</sub> sensor. **07**
- (b) Explain polarizable & non-polarizable electrodes. **07**

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