

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII • EXAMINATION – WINTER • 2014****Subject Code: 171705****Date: 29-11-2014****Subject Name: Instrumentation for Bio-medical Applications****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)** Draw and explain each block of generalized physiological Measurement System of human body. **07**
- (b)** List the quality of transducers so it will prefer in Biological parameter measurements. Why noncontact approach of measurement is best suited in medical science? Describe its reasons with proper arguments. **07**
- Q.2 (a)** List the error which accounted in physiological parameter measurement. Explain how it will nullify from the measurement. **07**
- (b)** Give the name of transducer with neat sketch and operation which will be used for muscular displacement monitoring. **07**
- OR**
- (b)** Discuss the characteristic of bio-medical amplifier. Explain the operation, schematic and application of chopper stabilized amplifier. **07**
- Q.3 (a)** Which types of measurement will take place using strain gauge transducer? Explain one of the measurements with neat sketch, working and benefits. **07**
- (b)** What is fibrillation? Describe DC defibrillator in details. **07**
- OR**
- Q.3 (a)** What is the prime objective of Signal conditioning? Explain it briefly with engineering justification. **07**
- (b)** How many noises will be considered in biological instrumentation? Explain each in details. **07**
- Q.4 (a)** Draw and describe the function of human heart. Obtain and draw its electrical activity on graph. **07**
- (b)** Enlist the safety procedure required in Operating room **07**
- OR**
- Q.4 (a)** Give overview of clinical instrumentation. Explain with schematic, working and limitation of Blood cell counter. **07**
- (b)** How optics is useful in biomedical field? Discuss the working and application of Spectrophotometer in details. **07**
- Q.5 (a)** Differentiate ICU versus ICCU equipment. Give the explanation of patient monitoring system for 8 bed unit. **07**
- (b)** Draw and describe Ultrasonic blood pressure measurement with neat sketch, operation, benefits and limitation. **07**
- OR**
- Q.5 (a)** List the properties of ultrasound energy which make it best suitable for medical diagnosis. Describe Doppler based blood flow meter **07**
- (b)** Explain Multichannel EEG recording system. **07**
