Seat No.:	Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII • EXAMINATION - SUMMER • 2014

Subject Code: 171705 Date: 31-05-2014 **Subject Name: Instrumentation for Bio-medical Applications Total Marks: 70** Time: 02:30 pm - 05:00 pm **Instructions:** 1. Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks Q.1 Explain heart circulatory system with relevant diagram. 07 (a) **(b)** "Body as a control system". Justify the statement. Draw block diagram of 07 biomedical measurement system. Enlist various systems of human body. Explain GI (Gastrointestinal) system in **Q.2** (a) 07 detail. **(b)** What are the ideal characteristics of bio-electric amplifier? Explain any one of 07 them with its circuit diagram. OR What is biopotential? Explain different types of bio-electrodes in detail. **07 (b) Q.3** Draw the basic block diagram of ECG machine. Enlist various artifacts related **07** (a) to ECG along with its sources. Explain the different categories of measurement and discuss the importance of 07 **(b)** SNR (Signal to Noise ratio) in biomedical measurement. Q.3 What is the significance of blood flow meter? Explain any one in detail. 07 (a) What is the importance of measurement of Blood pressure in the diagnosis of **(b) 07** cardiovascular disease? Enlist various techniques to measure Blood Pressure. Explain any one of them 0.4 What are the basic functions of kidney? Explain the components of 07 (a) haemodialysis machine with neat block diagram. Write a short note on: 07 **(b)** i) Spirometer ii) Defibrillator OR Explain the structure and function of central nervous system. **Q.4** (a) **07** What is pacemaker? Enlist different types of artificial pacemaker. Explain any 07 **(b)** one of them in detail. **Q.5** Give the names of medical laboratory instruments. Explain any one in detail. **07** (a) Discuss the architecture of operation theater. Enlist various instruments **(b)** 07 available in it. Discuss the properties of medical ultrasound. Explain different modes of **Q.5** 07 (a) ultrasound scan. Explain block diagram of EEG machine. Discuss EEG electrodes and 10-20 07 **(b)** system.
