

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – WINTER • 2014

Subject code: 1723101

Date: 02-12-2014

Subject Name: Virtual Biomedical Instrumentation System

Time: 02:30 pm - 05:00 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) What is distributed virtual instrumentation? 07
(b) Enlist and explain the different tools and platforms used for virtual biomedical instrumentation systems. 07
- Q.2** (a) Draw and explain architecture of virtual instrumentation system. 07
(b) Explain parallel port communication for Virtual Biomedical Instrumentation System with example. 07
- OR**
- (b) Explain serial port communication for Virtual Biomedical Instrumentation System with example. 07
- Q.3** (a) Draw and explain the block diagram for Ballistocardiogram (BCG) signal acquisition system. 07
(b) Write a short note on Huffman encoding for data compression. 07
- OR**
- Q.3** (a) Draw and explain the block diagram for PCG signal acquisition and classification for heart rate variability. 07
(b) Write a short note on run length encoding for data compression. 07
- Q.4** (a) Explain the types of analog signal. Discuss the effects of resolution on ADC Precision. 07
(b) Explain Virtual spirometer in detail. 07
- OR**
- Q.4** (a) Draw and explain the block diagram for virtual EMG signal acquisition system. 07
(b) Define signal limit setting. Calculate measurement precision of 12 bit A/D converter for various device voltage ranges and limit setting. 07
- Q.5** (a) Explain the use of circular buffer in any signal acquisition system. 07
(b) Discuss the advantages and disadvantages of digital filters with examples. 07
- OR**
- Q.5** (a) Write a short note on moving average filter. 07
(b) Explain the advantages and disadvantages between conventional and virtual System. 07
