

GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. - SEMESTER – II • EXAMINATION – WINTER 2012

Subject code: 1723101**Date: 29-12-2012****Subject Name: Virtual Biomedical instrumentation System****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)** What do you mean by virtual instrument? Explain the flexibility and the adaptability Virtual Biomedical Instrumentation System. **07**
- Q.1 (b)** Explain with real life examples, difference between conventional and virtual instrumentation system. **07**
- Q.2 (a)** Explain with suitable example, the advantages and disadvantages of PC based Data monitoring system. **07**
- Q.2 (b)** Explain protocols of parallel port digital data communication. **07**
- OR**
- Q.2 (b)** Explain protocols of serial port digital data communication. **07**
- Q.3 (a)** Explain the characteristics of ADC with suitable example. **07**
- Q.3 (b)** Calculate measurement precision of 10 bit A/D converter for various device voltage ranges and limit setting. **07**
- OR**
- Q.3 (a)** Explain the characteristics of DAC with suitable example. **07**
- Q.3 (b)** Which parameters should be considered while acquiring four analog waveforms having various frequency components ranges from 2 Hz to 10 kHz? **07**
- Q.4 (a)** Draw and explain the block diagram for virtual EMG signal acquisition system. **07**
- Q.4 (b)** Draw and explain the block diagram for conventional multipara monitoring system. **07**
- OR**
- Q.4 (a)** Draw and explain the block diagram for virtual ECG signal acquisition system and give the classification for heart rate variability. **07**
- Q.4 (b)** Draw and explain the block diagram for conventional EEG monitoring system. **07**
- Q.5 (a)** Give the difference between Digital and analog filters. Explain the concept of adaptive filtering. **07**
- Q.5 (b)** Enlist and explain the different control parameter for defibrillator machine. **07**
- OR**
- Q.5 (a)** Enlist and explain the different control parameter for hemodialysis machine. **07**
- Q.5 (b)** What is the need of data compression? Explain Huffman coding in detail. **07**
