Seat No.: _____ Enrolment No._____

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**

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