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

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