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GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– VII (New) EXAMINATION – WINTER 2019

Subject Code: 2170310   Date: 28/11/2019
Subject Name: Introduction to Virtual Biomedical Instrumentation
Time: 10:30 AM TO 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.

			MARKS
Q.1	**(a)**	Enlist the advantages of Virtual Instruments.	03
	(b)	Difference: Virtual vs. Traditional Instrument	04
	(c)	Draw and Explain the architecture of Virtual Instruments.	07
Q.2	**(a)**	Enlist the various sensor module and interface for VI.	03
	(b)	What are the roles of software and hardware in Virtual Instruments?	04
	(c)	Explain the role of database interface and a medical information system interface for VI.	07
		OR	
	(c)	Compare: Graphical and Textual Programming	07
Q.3	**(a)**	Define the role of File I/O operation in Modular Programming.	03
	(b)	Define functional integration? Discuss various types of approaches for functional integration.	04
	(c)	Classify types of noises based on various sources.	07
		OR	
Q.3	**(a)**	What is the role of the programming language in Virtual instrumentation?	03
	(b)	What is the requirement of analog signal conditioning? Classify various analog signal conditioning techniques for Biomedical application.	04
	(c)	Explain the block diagram of Noninvasive Blood Pressure Measurement in virtual Instruments.	07
Q.4	**(a)**	Enlist the advantages of Digital Filters over the analog filter.	03
	(b)	Elaborate the process of analog to digital conversion in detail.	04
	(c)	Explain the block diagram of virtual instrumentation of modular EMG.	07
		OR	
Q.4	**(a)**	Define: 1) Arrays 2) Clusters	03
	(b)	List and explain advanced filtering techniques.	04
	(c)	Enlist various types of A-to-D converters. Explain any one in detail.	07
Q.5	**(a)**	List out the steps for the Heart rate Variability analysis.	03
	(b)	List various types of noises and artifacts influencing EMG measurement.	04
	(c)	Draw and explain the various blocks of ECG used in designing virtual biomedical application.	07
		OR	
Q.5	**(a)**	What is the role of Virtual Instrumentation in Training and Education?	03
	(b)	Draw and Explain the effect of aliasing and antialiasing filters.	04
	(c)	Enlist the biomedical application of Virtual Instrumentation. Explain any one in detail with the help of a diagram.	07

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