GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER–VII (NEW) EXAMINATION – WINTER 2024

Subject Code:3170318   **Date:11-12-2024**

Subject Name: Virtual 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.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	Explain the below mentioned interface buses. a.) USB, b.) PCI, c.)PXI	**03**
	(b)	Explain the use of standard deviation, variance, kurtosis and quartiles for analysis of signal.	**04**
	(c)	Enlist and explain various types of charts and graphs.	**07**
Q.2	**(a)**	Explain auto indexing in array.	**03**
	(b)	Enlist various curve fitting techniques.	**04**
	(c)	Explain the virtual instrument for respiratory system with neat diagrams.	**07**
		OR	
	(c)	Compare and contrast graphical and textual programming language.	**07**
Q.3	**(a)**	Differentiate array and cluster with appropriate example.	**03**
	(b)	Describe the function of 4–20mA Current Loop.	**04**
	(c)	Describe the uses of power spectrum for analysing a signal.	**07**
		OR	
Q.3	**(a)**	Enlist the characteristics of D-to-A converter.	**03**
	(b)	Draw the architecture of virtual instrumentation.	**04**
	(c)	Explain the concept of local and global variables in context of VI.	**07**
Q.4	**(a)**	List various types of window functions.	**03**
	(b)	Classify presentation and control interfaces and explain any two in detail.	**04**
	(c)	Write a note on various kernels used inn wavelet transform.	**07**
		OR	
Q.4	**(a)**	Differentiate Virtual and Traditional Instrument.	**03**
	(b)	Explain adaptive filtering techniques.	**04**
	(c)	Enlist and explain various types of A-to-D converters.	**07**
Q.5	**(a)**	Classify types of noises based on frequency or time characteristics.	**03**
	(b)	Describe the structure and function of shift register.	**04**
	(c)	Discuss the methods for image acquisition and analysis using LabVIEW.	**07**
		OR	
Q.5	**(a)**	Define the effect of spectral leakage.	**03**
	(b)	Describe the use of wavelet transform for ECG baseline wandering removal.	**04**
	(c)	List the advantages and disadvantages of digital filters.	**07**

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