

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII EXAMINATION – SUMMER 2025****Subject Code:3170318****Date:23-05-2025****Subject Name:Virtual Instrumentation****Time:02:30 PM TO 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.
4. Simple and non-programmable scientific calculators are allowed.

		<b>MARKS</b>
<b>Q.1</b>	(a) What are the advantages of VI?	<b>03</b>
	(b) Provide a comparison between Graphical and Textual Programming.	<b>04</b>
	(c) Draw and Explain the Architecture of Virtual Instrument.	<b>07</b>
<b>Q.2</b>	(a) What are the different types of errors that can occur in LabVIEW?	<b>03</b>
	(b) Explain the methods of creating and calling a sub-VI.	<b>04</b>
	(c) Enlist and explain various types of structures available in LabVIEW with necessary applications.	<b>07</b>
<b>OR</b>		
	(c) Differentiate between chart and graph in LabVIEW.	<b>07</b>
<b>Q.3</b>	(a) What is a shift register?	<b>03</b>
	(b) What are the different types of shift registers and formula nodes?	<b>04</b>
	(c) What are the different types of case structures and sequence structures?	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) Define string I/O and file I/O.	<b>03</b>
	(b) Define local and global variable. How do you declare local and global variables?	<b>04</b>
	(c) Explain Sensor module with classification of sensors.	<b>07</b>
<b>Q.4</b>	(a) Compare analog and digital filters.	<b>03</b>
	(b) What is a power spectrum? How can power spectra be used to analyze signals?	<b>04</b>
	(c) What is GPIB? What are the advantages and disadvantages of using GPIB?	<b>07</b>
<b>OR</b>		
<b>Q.4</b>	(a) What is a power spectrum? How can power spectra be used to analyze signals?	<b>03</b>
	(b) What are some of the most common applications of wavelet transforms in NI LabVIEW?	<b>04</b>
	(c) Explain the Characteristics of Different Types of Window Functions.	<b>07</b>
<b>Q.5</b>	(a) Enlist and define the features of ECG signal.	<b>03</b>
	(b) Enlist and explain the techniques for QRS detection.	<b>04</b>
	(c) Draw and explain block diagram of virtual instrumentation of modular EMG machine.	<b>07</b>

**OR**

- Q.5** (a) Explain the advantages of using virtual instrumentation in respiratory system monitoring compared to traditional methods **03**
- (b) Describe the advantages of using virtual instrumentation for image acquisition and processing compared to traditional methods. **04**
- (c) Explain the virtual instrumentation in the segmentation and analysis of biomedical images for diagnostic purposes. **07**

\*\*\*\*\*