Seat No.:	Enrolment No.

## **GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE - SEMESTER- VI (NEW) EXAMINATION - WINTER 2021** 

Subject Code:3160620	Date:30/11/2021
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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.

			MARKS
Q.1	(a)	What is measurement & instrumentation? & Explain the elements of measurement systems.	03
	<b>(b)</b>	•	04
	(c)	What is strain gauge? & explain load cell.	07
Q.2	(a)	List various physical variable.	03
	<b>(b)</b>	What is sensor? List out various type of sensor with their use.	04
	(c)	List various Flow sensor and explain any one of them.  OR	07
	(c)	List various pressure sensor and explain any one of them.	07
Q.3	(a)	Explain Measurement uncertainty.	03
	<b>(b)</b>	Explain types of instrumentation.	04
	(c)	List various temperature sensor and explain any one of them.  OR	07
Q.3	(a)	What are the different types of signal and differentiate it.	03
	<b>(b)</b>	What is noise? & explain SNR.	04
	(c)	List various pressure sensor and explain any one of them.	07
Q.4	(a)	Define target for Approach to Planning Monitoring Programs	03
	<b>(b)</b>	· · · · · · · · · · · · · · · · · · ·	04
	(c)	Explain Permanent installations & Temporary installations of sensor.  OR	07
<b>Q.4</b>	(a)	Describe the order and methodology for sensor installation	03
	<b>(b)</b>	List Criteria for Sensor selection.	04
	(c)	Explain one case study of Approach to Planning and Monitoring Programs	07
Q.5	(a)	Define following term 1. Mode 2. Range	03
	<b>(b)</b>	Explain Time domain signal processing.	04
	(c)	What is FFT and explain its application in civil engineering.	07
	` ′	OR	
Q.5	(a)	Define following term	03
		1. Average value (mean) 2. Standard deviation	
	<b>(b)</b>	Explain Fourier Transform & its application.	04
	(c)	Explain the need for frequency domain analysis and its principles.  ***********************************	07

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## **GUJARAT TECHNOLOGICAL UNIVERSITY**

(b) Explain in brief: Sensor selection criteria. (c) Write a short note on to predict the response of various inputs.  OR  OR  Q.3 (a) Define: Sensor siting. (b) Differentiate between continuous and discrete signals. (c) Write a short note on Construct a conceptual instrumentation and monitoring program.  Q.4 (a) Define: Frequency resolution. (b) Differentiate between types of sensors and their modes of operation and measurement. (c) Describe the order and methodology for sensor installation by considering example of Real Time Hydrological Information System.  OR  Q.4 (a) Define: Signal and Noise. (b) Write a short note on the time domain signal processing. (c) Explain in brief about data reduction and interpretation with necessary example.  Q.5 (a) Define: Measurement uncertainty. (b) Write a short note on the data analysis and interpretation with reference to inclinometer. (c) Explain the need for the frequency domain analysis and its principles.  OR			BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2022	
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<b>V.5</b> (a) Describe reduction with inters.	Q.5	(a)	Describe Noise reduction with filters.	03
(b) Write a short note on the Fast Fourier Transform (FFT). 04	_			
(c) Explain the basic concepts in frequency domain signal processing and analysis. 07				07

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