

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023****Subject Code:3173524****Date:16-12-2023****Subject Name: Advanced Instrumentation Techniques****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 Instrumentation? Give its significance in environmental science & technology field.	03
	(b) Define the terms: (i) Instrumentation (ii) Spectroscopy (iii) GPS (IV) GIS	04
	(c) Write a note on mass spectroscopy with neat sketch.	07
Q.2	(a) Define the Lambert's and Beer's Law.	03
	(b) Describe the measurement method of soil conductivity and soil pH in detail.	04
	(c) What do you mean by remote sensing? And illustrate all components of the remote sensing with the help of figure.	07
OR		
	(c) Write a short note on Atomic Absorption Spectroscopy.	07
Q.3	(a) What is Chromatography? Enlist the types of the chromatographic methods.	03
	(b) Write down working principle of colorimeter.	04
	(c) Explain the gas chromatography with the help of neat sketch.	07
OR		
Q.3	(a) Explain GPS system with the help of neat sketch.	03
	(b) Differentiate between portable instrument and stationary instrument.	04
	(c) Explain the ion exchange chromatography with neat sketch.	07
Q.4	(a) What is pH? And enlist the different methods used for measurement of pH.	03
	(b) Write a note on gas displacement collectors with neat sketch.	04
	(c) Write a short note on Integrated or long term air sampling.	07
OR		
Q.4	(a) Write down the advantages and disadvantages of flame photometer.	03
	(b) Differentiate between AAS and FES.	04
	(c) Explain the phenomena of fritted bubblers and spiral absorber which are used for air sampling with a neat sketch	07
Q.5	(a) Enlist the application, advantages and disadvantages of Thermal Conductivity Detector.	03
	(b) Explain Noise Dosimeter and its placement on human body.	04
	(c) Write a note on High Performance Liquid Chromatography.	07
OR		
Q.5	(a) Write down the application, advantages, and disadvantages of Photoionization Detector.	03
	(b) Highlight the application of TOC analyzer	04
	(c) State the Principle of IR Spectroscopy with its instrumentation and neat Sketch.	07
