

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER- VII EXAMINATION-SUMMER 2023****Subject Code: 3173524****Date: 30/06/2023****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

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|------------|---|-----------|
| Q.1 | (a) Define: spectroscopy, remote sensing and chromatography. | 03 |
| | (b) Highlight the applications of Gas Chromatography. | 04 |
| | (c) Discuss the various types of instrumentation used for environmental engineering. | 07 |
| Q.2 | (a) What is the difference between stationary phase and mobile phase in chromatography? | 03 |
| | (b) What do you mean by instrumentation? Give its significance in the field of Environmental Science & Technology. | 04 |
| | (c) Enlist the components of the remote sensing process and explain each with the help of a neat diagram. | 07 |
| | OR | |
| | (c) Explain IR spectroscopy with the help of a neat sketch. | 07 |
| Q.3 | (a) Discuss the applications of spectroscopy in the field of environmental science and technology. | 03 |
| | (b) Describe the procedure used for measurement of pH and EC of soil samples. | 04 |
| | (c) Discuss atomic absorption spectroscopy with a schematic diagram. | 07 |
| | OR | |
| Q.3 | (a) Write down the principle of colorimeter. | 03 |
| | (b) Discuss the techniques which are used for quadrat sampling. | 04 |
| | (c) Discuss the working principle and constructional features of UV-spectrophotometer with a neat sketch. | 07 |
| Q.4 | (a) List the applications, advantages and disadvantages of a photoionization detector. | 03 |
| | (b) List the applications, advantages and disadvantages of flame emission spectrophotometer. | 04 |
| | (c) Discuss the principle of mass spectroscopy with its instrumentation and applications in environmental analysis. | 07 |
| | OR | |
| Q.4 | (a) Explain GPS system with the help of a neat sketch. | 03 |
| | (b) Discuss the working principle and applications of a thermal conductivity detector. | 04 |
| | (c) Explain the working principle, instrumentation and applications of FAS. | 07 |
| Q.5 | (a) What is pH? List the various methods for pH determination. | 03 |
| | (b) Enlist the instruments used for grab sampling of air and explain anyone in detail. | 04 |
| | (c) Explain colorimetric analysis with the help of a schematic diagram. | 07 |
| | OR | |
| Q.5 | (a) Write a note on gas displacement collectors with neat sketch. | 03 |
| | (b) Differentiate between portable and stationary instruments. | 04 |
| | (c) Explain noise dosimeter and its placement on human body. | 07 |
