Seat No.: _____  Enrolment No. 

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE- SEMESTER–V (NEW) EXAMINATION – WINTER 2020**

**Subject Code:3150311** **Date:27/01/2021**

**Subject Name:Analytical Instrumentation Techniques**

**Time:10:30 AM TO 12:30 PM** **Total Marks:56**

**Instructions:**

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

| | | | MARKS |
|---|---|---|---|
| **Q.1** | **(a)** | Define the following terms: (i) Analytical Instruments (ii) Transducers | **03** |
| | **(b)** | Describe the different types of errors in measurement. | **04** |
| | **(c)** | Explain different elements of Analytical Instrument in detail with block diagram. | **07** |
| **Q.2** | **(a)** | Draw the Electromagnetic Spectrum. | **03** |
| | **(b)** | State and Explain the Beer–Lambert law with necessary questions. | **04** |
| | **(c)** | Define the principle of Chromatography and explain Gas Chromatography in detail. | **07** |
| **Q.3** | **(a)** | Draw the schematic diagram of glass electrode for pH measurement. | **03** |
| | **(b)** | Write a short note on an Optical Filters used in spectrophotometry. | **04** |
| | **(c)** | Define the principle of Flame Photometry and explain basic flame photometer in detail with necessary diagrams. | **07** |
| **Q.4** | **(a)** | Explain the principle of pH measurement. | **03** |
| | **(b)** | Write a short note on Capnography. | **04** |
| | **(c)** | Explain the working of Mass Spectrometer in detail with its types. | **07** |
| **Q.5** | **(a)** | Enlist different electrophoresis techniques. | **03** |
| | **(b)** | Write a short note on ELISA reader. | **04** |
| | **(c)** | Explain the instrumentation of simple & compound microscopy. Discuss the methods to enhance the quality of magnification. | **07** |
| **Q.6** | **(a)** | Define the following terms: (i) Accuracy (ii) Precision | **03** |
| | **(b)** | Write a short note on a Glucometer. | **04** |
| | **(c)** | Enlist the different types of blood cell counting methods and explain any one in detail. | **07** |
| **Q.7** | **(a)** | Enlist the major differences between Autoclave and Hot air oven. | **03** |
| | **(b)** | Write a short note on a Centrifuge. | **04** |
| | **(c)** | Explain the Complete Blood Gas Analyzer with block diagram. | **07** |
| **Q.8** | **(a)** | Enlist the advantages of PC-Based Analytical Instruments. | **03** |
| | **(b)** | Write a short note on Incubators. | **04** |
| | **(c)** | Explain Blood pCO2 measurement in detail with its electrode construction. | **07** |