

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**B.PHARM- SEMESTER VIII – • EXAMINATION – WINTER -2021**

**Subject Code: BP811TT****Date: 25/11/2021****Subject Name: Advanced Instrumentation Techniques****Time: 10:30am to 01:30pm****Total Marks: 80****Instructions:**

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

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|-------------|-----|---|-----------|
| <b>Q.1</b>  | (a) | Explain: Base peak, Mc lafferty rearrangement, Nitrogen rule in mass spectroscopy.              | <b>06</b> |
|             | (b) | What is resolution of mass analyzer. Explain briefly time of flight analyzer.                   | <b>05</b> |
|             | (c) | Explain working principle of Mass spectrometer with labeled diagram.                            | <b>05</b> |
| <b>Q.2</b>  | (a) | Define chemical shift. Elaborate factors affecting spin-spin coupling.                          | <b>06</b> |
|             | (b) | Write a note on instrumentation of NMR.   | <b>05</b> |
|             | (c) | Write a brief overview of C13 NMR spectroscopy.   | <b>05</b> |
| <b>Q.3</b>  | (a) | Discuss important factors in sample preparation and handling in DTA                             | <b>06</b> |
|             | (b) | Describe the principle of TGA and DTA methods.  | <b>05</b> |
|             | (c) | What is the instrumentation and application of DSC?   | <b>05</b> |
| <b>Q.4</b>  | (a) | Discuss the importance of hyphenated techniques in analysis with special reference to GC-MS/MS. | <b>06</b> |
|             | (b) | Discuss instrumentation and applications of X-ray powder diffraction technique.                 | <b>05</b> |
|             | (c) | What is extraction. Give detail note on liquid-liquid extraction technique.                     | <b>05</b> |
| <b>Q.5</b>  | (a) | Explain validation and calibration of UV-Visible spectrophotometer.                             | <b>06</b> |
|             | (b) | Discuss calibration of electronic balance.  | <b>05</b> |
|             | (c) | Write note on principle and instrumentation of radio-immunoassay.                               | <b>05</b> |
| <b>Q. 6</b> | (a) | Write note on solid phase extraction.   | <b>06</b> |
|             | (b) | Explain validation and calibration of HPLC.   | <b>05</b> |
|             | (c) | Write note on fragmentation in MS.  | <b>05</b> |
| <b>Q.7</b>  | (a) | Write note on HPTLC-MS.   | <b>06</b> |
|             | (b) | Explain advantages and application of RIA.  | <b>05</b> |
|             | (c) | What is x-ray diffraction? Give detail idea about Bragg's law.                                  | <b>05</b> |

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