

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**B.PHARM - SEMESTER- 8 EXAMINATION – SUMMER -2023**

**Subject Code: BP811TT****Date: 03/07/2023****Subject Name: Advanced Instrumentation Techniques****Time: 10.30 a.m. to 1.30 p.m.****Total Marks: 80****Instructions:**

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

<b>Q.1</b>	(a) Define chemical shift. Explain various factors affecting chemical shift	<b>06</b>
	(b) What are X-rays? Explain the origin of X-rays and discuss the Bragg's law	<b>05</b>
	(c) Explain Spin Spin coupling with example	<b>05</b>
<b>Q.2</b>	(a) Write a note on Solid –Phase extraction techniques	<b>06</b>
	(b) Describe Principle and applications of NMR spectroscopy	<b>05</b>
	(c) Explain various rules for fragmentation in Mass spectroscopy	<b>05</b>
<b>Q.3</b>	(a) Explain MALDI and Quadrupole analyzer in brief	<b>06</b>
	(b) List various ionization sources used in mass spectrometry. Explain chemical ionization source in detail	<b>05</b>
	(c) Discuss principle, Instrumentation and applications of DTA	<b>05</b>
<b>Q.4</b>	(a) Explain principle and applications of differential scanning calorimetry	<b>06</b>
	(b) Write a note on Calibration of IR Spectroscopy	<b>05</b>
	(c) Give a brief note on GC-MS	<b>05</b>
<b>Q.5</b>	(a) Write a note on Calibration of UV-Visible Spectrophotometer	<b>06</b>
	(b) Discuss the Limitation and Application of RIA	<b>05</b>
	(c) Discuss Mc-Lafferty rearrangement	<b>05</b>
<b>Q.6</b>	(a) Discuss the Principle and Different techniques involved in RIA	<b>06</b>
	(b) Write a note on Calibration of HPLC	<b>05</b>
	(c) Write a note on Time of flight analyzer	<b>05</b>
<b>Q.7</b>	(a) Give an overview of LC-MS and LC-MS/MS	<b>06</b>
	(b) Explain in detail about the Liquid-Liquid extraction techniques	<b>05</b>
	(c) What are thermal methods of analysis? Discuss principle and applications of TGA	<b>05</b>

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