Seat No.: _____ Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.PHARM - SEMESTER– 7 EXAMINATION – SUMMER-2024

Subject Code:BP701TP Date: 30/04/2024

Subject Name: Instrumental Methods of Analysis

Time: 02.30 p.m. to 5.30 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.**

Q.1	**(a)**	What is spectrometry? Classify spectrometry with examples. Explain energy levels of molecules.	**06**
	(b)	Derive beer's lambert law of UV visible spectrometry. Give its limitations.	**05**
	(c)	Explain chromophores and auxochromes. Convert 250 nm into frequency (Hz).	**05**
Q.2	**(a)**	Write principle of IR spectroscopy. Give modes of vibration of molecules.	**06**
	(b)	Write a note on factors affecting vibrations with examples.	**05**
	(c)	Write a note on theory and instrumentation of atomic emission spectroscopy.	**05**
Q.3	**(a)**	What is chromatography? Classify chromatography with examples.	**06**
	(b)	Give basic principle, methodology, advantages, and disadvantages of TLC.	**05**
	(c)	Write a note on gel chromatography.	**05**
Q.4	**(a)**	Write basic principle involved in HPLC. Draw diagram of HPLC instrument.	**06**
	(b)	Write a note on nepheloturbidometry.	**05**
	(c)	Write a note on detectors used in Gas chromatography.	**05**
Q.5	**(a)**	Write principle, merits, demerits, and applications of ion exchange chromatography.	**06**
	(b)	Write a note on affinity chromatography.	**05**
	(c)	Explain: Rf, Rt, Guard column, Reversed Phase Chromatography, Isocratic mobile phase.	**05**
Q. 6	**(a)**	Explain effect of solvent and pH on λmax with examples.	**06**
	(b)	Give theory of fluorescence. Write factors affecting fluorescence.	**05**
	(c)	Draw FTIR instrument. Explain detectors used in IR spectrometer.	**05**
Q.7	**(a)**	Write a note on Capillary electrophoresis.	**06**
	(b)	Write a note on monochromators used in UV visible spectrophotometer.	**05**
	(c)	Give IR stretching peaks (cm^{-1}) of C=O, N-H, C-H, C-O, C=C.	**05**

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