Seat No.: _____ Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.PHARM – SEMESTER – VII EXAMINATION – WINTER-2025

Subject Code: BP701TP **Date:13-11-2025**

Subject Name: Instrumental Methods of Analysis

Time:10:30 AM TO 01:30 PM **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)**	Describe UV-Visible spectroscopy instrumentation: sources, selectors, cells, detectors.	**06**
	(b)	Enlist various detectors used in Gas chromatography. Explain any one in detail.	**05**
	(c)	Compare adsorption and partition column chromatography. Discuss their methodologies, advantages, disadvantages, and notable applications.	**05**
Q.2	**(a)**	Describe the principles of thin layer chromatography (TLC) and enlist advantages and limitations of TLC.	**06**
	(b)	Discuss the influence of solvent on absorption spectra in UV-Visible spectroscopy.	**05**
	(c)	Explain different stationary phases used in gas chromatography.	**05**
Q.3	**(a)**	Explain instrumentation of HPLC with labeled diagram.	**06**
	(b)	Describe the detectors used in IR spectroscopy with advantages and limitations.	**05**
	(c)	Write a brief note on Nephlometry and Turbidimetry with its applications.	**05**
Q.4	**(a)**	Explain Principle and applications of HPLC	**06**
	(b)	Explain in detail flame and nebulizer burner system in flame photometry	**05**
	(c)	Define: (i) Retention time (ii) Tailing factor (iii) Capacity factor (iv) HETP (v) Resolution	**05**
Q.5	**(a)**	Explain the principle and Instrumentation of affinity chromatography.	**06**
	(b)	Describe the Beer-Lambert law and its derivation in UV-Visible spectroscopy	**05**
	(c)	Write a note on paper chromatography	**05**
Q. 6	**(a)**	Explain fundamental vibrations in polyatomic molecules in IR spectroscopy and factors affecting them.	**06**
	(b)	Write factors affecting ion exchange chromatography	**05**
	(c)	Explain difference between TLC and HPTLC.	**05**
Q.7	**(a)**	Explain gel electrophoresis. How does it separate biomolecules based on size and charge?	**06**
	(b)	Define singlet, doublet, and triplet electronic states in fluorimetry. Explain fluorescence factors and quenching.	**05**
	(c)	Compare atomic emission, and atomic absorption spectroscopy, focusing on their strengths, limitations, and applications.	**05**

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