

**Second Semester M. Pharm Degree Supplementary Examinations**  
**August 2021**

**M.Pharm (Pharmaceutical Analysis)**

**Paper I: Advanced Instrumental Analysis (MPA 201T)**

**Time: 3 Hours**

**Total Marks: 75**

- *Answer all questions to the point neatly and legibly • Do not leave any blank pages between answers • Indicate the question number correctly for the answer in the margin space*
- *Answer all parts of a single question together • Leave sufficient space between answers*
- *Draw table/diagrams/flow charts wherever necessary*

**Essays**

**(3x10=30)**

1. Which are the types of pumps used in HPLC. Explain their working, advantages and applications in detail.
2. Explain electron spray ionization and chemical ionization in mass spectrometry with their advantages and limitations.
3. Explain the principle of nuclear magnetic resonance spectroscopy.

**Short Notes**

**(9x5=45)**

4. A method for simultaneous estimation of ibuprofen and paracetamol is developed. The chromatographic parameters are as follows.

	Paracetamol	Ibuprofen
Retention time	3.5 minutes	6.3 minutes
Width at base	1.8 cm	2.3 cm
Width at half height	1.0 cm	1.4 cm
Area in $\text{cm}^2$	1864	2326

If the column length is 25 cm and the flow rate is 1 ml/minute, then calculate:

- Number of theoretical plates
- Plate height
- Resolution
- Separation factor
- Capacity factor

5. Explain affinity chromatography. List any two specific advantages and disadvantages of the same.
6. What are different types of quantification in gas chromatography.
7. Why HPTLC is called high performance thin layer chromatography.
8. Explain the principle of super critical fluid chromatography.
9. Explain the general process of capillary electrophoresis method development.
10. Differentiate high performance liquid chromatography and capillary electrophoresis.
11. Explain the functioning and applications of quadrupole mass analyzer.
12. Explain nuclear shielding and how does it affect NMR signals.