

PARUL UNIVERSITY
FACULTY OF PHARMACY
M.Pharm. Winter 2022-23 Examination

Semester: 1**Subject Code: MPC101T****Subject Name: Modern Pharmaceutical Analytical Techniques****Date: 13/03/2023****Time: 10:00am to 1:00pm****Total Marks: 75****Instructions:**

1. Figures to the right indicate maximum marks.
2. Make suitable assumptions wherever necessary.

Q.1 Essay Type Questions. (any 2 out of 3) (15 Marks Each) (30)

1. a. Explain in detail about factors affecting vibrational frequencies in IR Spectroscopy. What are the applications of IR Spectroscopy?
b. Explain brief outline of principles of FT-NMR and ¹³C NMR. Write common applications of NMR spectroscopy.
2. a. Explain in detail about Mass fragmentation and its rules.
b. Explain in detail about factors affecting resolution in HPLC and HPTLC. Write brief comparison of both the mentioned chromatographic techniques.
3. a. Write about "Bragg's law" of X ray Crystallography. What are the key applications of X-ray diffraction techniques?
b. Write a brief note on "Differential Thermal Analysis (DTA)".

Q.2 Short Essay Type Questions. (any 5 out of 6) (5 Marks Each) (25)

1. Write a brief note on Derivative spectroscopy. Explain the major reasons behind choosing derivative spectroscopy for determination of sample mixture.
2. Define "Chemical Shift". What are the various factors which affect chemical shift in NMR Spectroscopy?
3. Explain brief about different types of ionization techniques in Mass spectroscopy.
4. Write about basic principle and applications of Gas chromatography.
5. Write principle, instrumentation and working conditions of "Moving boundary electrophoresis".
6. Write a note on Thermogravimetric analysis (TGA).

Q.3 Short Answers. (2 Marks Each)

(20)

1. How one can choose solvents for sample determination by UV Spectrophotometry?
2. Explain in brief about “Theory of Fluorescence”.
3. Write comment on the given statement: “Tetramethylsilane became the established internal reference compound for ^1H NMR”
4. Explain “Spin-Spin coupling” in NMR Spectroscopy.
5. What is “Meta stable ions” in Mass spectroscopy?
6. Write brief about “Isotopic peak” in Mass spectroscopy.
7. Explain in brief about principle of affinity chromatography.
8. Write brief about “Ion exchange resins” used in Ion exchange chromatography.
9. Write brief about “Gel electrophoresis”.
10. Write brief applications of Potentiometry.