

Subject: Modern Pharmaceutical Analytical Techniques

M. Pharm 1st Year 1st Semester Examination 2025

Full Marks: 75

Answer any five questions taking at least one from each group but not more than two.

Group A

1. How anisotropic effect affecting chemical shift for ¹H NMR. Discuss with suitable example. Write about Shielding and Deshielding. [9+6]
2. Write short notes on (**any three**) [15]
 - a. Electron impact ionization (EI)
 - b. Fast Atom Bombardment Ionization (FAB)
 - c. MALDI
 - d. Double focusing mass analyzer
3.
 - a) Explain different compartments of Mass Spectrometer with proper diagram. [7.5]
 - b) Explain different parts of NMR Instrument with proper diagram. [7.5]
4. Write notes on (**any three**) [15]
 - a) Spin-spin coupling
 - b) Pascal Triangle
 - c) Chemical ionization
 - d) Quadrupole mass analyzer

Group B

5. Write the theory and the different electronic transitions associated with UV spectroscopy. Describe the various types of sources and detectors used in UV-visible spectroscopy. [7+8]
6. Why are the shape and intensity of peaks important in interpreting the IR spectrum? Discuss with some examples. How do you analyze the IR spectrum of different carbonyl compounds? [6+9]
7. Write short notes on (a) theory of fluorescence and phosphorescence (b) Applications of UV spectroscopy (c) Solvents effects in UV spectroscopy (d) Symmetric and asymmetric stretching with examples (e) theory of flame photometry [5x3 = 15]

Group C

8. Discuss the stages, and types of chemical analysis. Write an account on chemical analysis based on sample size, and analytical methods. Discuss various quantitative chemical analysis by Classical Methods and instrumental methods with proper examples. Write an account of data domain map. 3 + 4 + 5 + 3 = 15
9. Deduce the relationship between cell constant and specific conductivity. How do you measure conductivity of unknown solution? Write in detail about the application of conductivity measurements. Write an account on principle and application of conductometric titration. 3 + 4 + 4 + 4 = 15
10. Write an account on the principle and application of bioluminescence. Write an account on steps and procedure of RIA. Discuss methods and applications of ELISA. 5 + 5 + 5 = 15