



**MODERN PHARMACEUTICAL ANALYSIS  
(OS & RS)**

**Q.P. CODE : 7891**

Your answers should be specific to the questions asked.

Draw neat labeled diagrams wherever necessary. Answer **FOUR** questions

**LONG ESSAYS (ANSWER ANY FOUR)**

**4 X 25 = 100 Marks**

- Explain the general fragmentation rules for organic compounds in mass spectroscopy.
  - Write the principles involved in the functioning of quadrupoles and time of flight analyzers.
- What is chemical shift in NMR? Write factors affecting the chemical shift.
  - Write a brief account on 2D-NMR.
  - Identify the structure of organic compound using following data:  
Mol. Wt:  $C_5H_{10}O$   
IR peaks: 2980, 1715, 1375, and  $1120\text{ cm}^{-1}$   
Mass spectra peak: 86, 71, 58, 43 (base peak) and 27  
C-NMR peak: 210, 55, 34, 22, 18  
NMR spectra ( $\delta$ ): 2.4 (2H, triplet), 2.1 (3H, singlet), 1.7 (2H, hexet), 0.9 (3H, triplet)
- What is Hooke's law? Write its importance in IR spectroscopy.
  - What are the difference between dispersive and FT-IR spectrophotometer?
  - How will you identify the following functional groups in an organic compound?  
OH-, -NH<sub>2</sub>, -COOR, -C=C-, -CHO
- Write a note on any **FIVE** only

  - Atomic absorption spectroscopy
  - HPTLC
  - Precolumn derivatisation technique
  - Octant rule
  - Bravis's lattices
  - Test for statistical significance and Student 'T' test
- Explain Woodward's rule and its applications in structural elucidation.
  - Explain in detail any two methods for simultaneous estimation of multicomponent sample by UV Spectrophotometry.
  - Explain principle and working of phototube and photomultiplier tube detector in UV-Visible spectrophotometer.
- Write the principles of gas chromatography. Draw a neat labeled diagram of GC instrument and explain any two detectors used.
  - Explain the principle of super critical fluid chromatography.
  - What are theoretical plates? Explain Van-Deemter equation.

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