

QP Code: 101350

Reg No:

**First Year M.Pharm Degree Examinations– September 2013
(2011 Scheme)**

Modern Analytical and Research Methods

(Common for all branches)

Time: 3 hrs

Maximum Marks: 100

- *Answer all questions*
- *Draw diagrams wherever necessary*

Essays: (2x20 =40)

1. Discuss the theory of nuclear magnetic resonance (NMR) spectroscopy. Illustrate with suitable example the usefulness of H1 NMR in the structural elucidation of organic compounds. (10+5+5=20)
2. Explain the rules of molecular absorption of UV-visible radiation. Arrive at an expression relating concentration, path length and absorbance. Describe the various quantification techniques in UV-Visible spectrophotometry. (5+5+10=20)

Short Essays: (6x10=60)

3. Explain the working of a Fourier transform infra red (FTIR) spectrophotometer. Mention its merits over the conventional one.
4. Explain the characteristics of the mass spectrum of a compound using a graphical representation. Add a note on its usefulness in the structural elucidation of organic compounds.
5. Explain the chemistry of high performance liquid chromatography (HPLC) columns. Add a note on the criteria of solvent selection in HPLC.
6. Describe the theory of atomic absorption spectrophotometry (AAS). Add a note on hollow cathode lamps.
7. Explain the following: • Bragg's law • Miller indices • Generation of protein structure by x-ray diffraction
8. Explain the different significance tests used in statistics.
