



- Notes :
1. All questions carry equal marks.
 2. Diagrams and Chemical equation should be given wherever necessary.
 3. Question No. **1** is compulsory. Solve **any four** questions from remaining.

1. Solve **any four** of the following. **16**
 - a) Explain principle of mass spectrometry.
 - b) Give ISO guidelines.
 - c) Explain about partition coefficient.
 - d) Explain factors affecting chemical shift.
 - e) Write about different ionization techniques in mass spectrometry.
2.
 - a) Explain in detail instrumentation of mass spectrometry. **10**
 - b) Write a note on ICH guidelines. **6**
3.
 - a) Write in detail instrumentation of NMR spectroscopy. **8**
 - b) Write about Radioimmunoassay. **8**
4. Write in detail principle, instrumentation & methods of x-ray diffraction. **16**
5.
 - a) What is liquid-liquid extraction ? Explain factors affecting extraction. **8**
 - b) Write short note on photocolourimetry. **8**
6. Write note on :
 - a) Kjeldahl's method of Nitrogen estimation. **8**
 - b) Validation of analytical instruments & methods. **8**
7. Write note on **any two**. **16**
 - a) Electrophoresis.
 - b) GLP
 - c) Documentation and Record Keeping.
