

**FACULTY OF SCIENCE**  
**M. Sc. I – Semester Examination, January 2018**

**Subject : Biochemistry**

**Paper – III**  
**Bio-Analytical Techniques**

**Time : 3 Hours**

**Max. Marks: 80**

**Note : Answer all questions from Part–A and Part–B. Each question carries 4 marks in Part–A and 12 marks in Part – B.**

**PART - A (8 X 4 = 32 marks)**  
**(Short Answer Type)**

Write a short note on the following:

- 1 Applications of atomic absorption spectroscopy •
- 2 Principle of mass spectroscopy •
- 3 Gel exclusion chromatography •
- 4 N-terminal sequencing of proteins •
- 5 Density gradient centrifugation •
- 6 Differences between native and SDS-PAGE
- 7 Phosphor- imaging •
- 8 Isotopes used for labeling nucleic acids

**PART - B (4 X 12 = 48 marks)**  
**(Essay Answer Type)**

- 9 (a) Explain the principle, instrumentation and applications of NMR and ORD.  
**OR**  
 (b) Give an account on:  
 (i) X-ray crystallography  
 (ii) Fluorescence spectroscopy
- 10 (a) Discuss the principle and applications of HPLC and affinity chromatography  
**OR**  
 (b) Write a note on  
 (i) GC  
 (ii) Ion-exchange chromatography
- 11 (a) Describe the principle, instrumentation and applications of ultracentrifugation  
**OR**  
 (b) Give an account on  
 (i) DNase-I hypersensitivity mapping  
 (ii) Southern blotting
- 12 (a) Describe the methods used in the detection of radioactivity  
**OR**  
 (b) Explain the role of radio-isotopes in understanding the mechanisms involved in photosynthesis and viral replication