

(i) Printed Pages : 3

Roll No.

(ii) Questions : 9

Sub. Code :

2	5	9	4	2
---	---	---	---	---

Exam. Code :

0	4	3	6
---	---	---	---

M.Sc. Bio-Technology 2nd Semester

(2056)

BIOPHYSICAL AND BIOCHEMICAL TECHNIQUES

Paper-MBIO-202

Time Allowed : Three Hours] [Maximum Marks : 80

Note :— Attempt **FIVE** questions in all. Question No. **I** is compulsory and select **ONE** question from each Unit.

I. Answer Briefly:

- (a) Difference between Cation and Anion Exchanger 3
- (b) Difference between Phosphorescence and Fluorescence 3
- (c) 2D Electrophoresis 3
- (d) Hydrophobic interactions 3
- (e) Polarizability 2
- (f) Chemical Shift. 2

UNIT-I

- II. (a) Explain the fundamental principles, key system components, and types of detectors in High-Performance Liquid Chromatography (HPLC). 12
- (b) Highlight differences between Liquid Chromatography and Gas Chromatography. 4

OR

- III. (a) What is the basic mechanism of separation in Gel Permeation Chromatography? 8
- (b) What is the procedure for determining the molecular weight of a protein using gel permeation chromatography? 8

UNIT-II

- IV. (a) State and derive Lambert-Beer's law. 8
- (b) What are the applications of UV-Visible spectroscopy for qualitative and quantitative determination of nucleic acids and proteins? 8

OR

- V. What are the sequential steps for solving 3D structure determination of protein using X-ray crystallography? 16

UNIT-III

- VI. (a) What are the underlying principles of SDS-PAGE and the instrument required to perform the protein separation technique? 12

- (b) Explain differences between SDS-PAGE and Native PAGE. 4

OR

- VII. (a) What is the difference between differential centrifugation and density gradient centrifugation in terms of their separating principles? 8
- (b) What are the different types of rotors available for centrifugation and what are their specific applications? 8

UNIT-IV

- VIII. (a) What are the main steps involved in the Southern blotting process? 12
- (b) Which type of membrane is commonly used to transfer DNA in this technique? 4

OR

- IX. (a) Explain the detailed mechanism of Edman Degradation of protein sequencing. 10
- (b) Cite examples of radiotracers in biology and medicine. 6