

**ASSIGNMENT BOOKLET**

**Master Degree Programme  
M.Sc. in Biochemistry (MSCBCH)**

**BIOANALYTICAL TECHNIQUES  
(Valid from 1<sup>st</sup> January, 2024 to 31<sup>st</sup> December, 2024)**



**School of Sciences  
Indira Gandhi National Open University  
Maidan Garhi, New Delhi-110068  
(2024)**

Dear learners,

Please read the section on assignments in the Programme Guide of M.Sc. Biochemistry (MSCBCH) programme that we sent you after your enrolment. A weightage of 30 percent, as you are aware, has been earmarked for continuous evaluation, **which would consist of one tutor-marked assignment** for the course-Cell and Molecular Biology which is the first semester core course of MSCBCH. The assignment in this booklet consists of two parts, Part A and B. It covers all blocks (I-IV) of the course. The total marks of all the parts are 100, of which 35% are needed to pass it.

### **Instructions For Formatting Your Tutor Marked Assignments (TMA)**

Before attempting the assignment please read the following instructions carefully:

1) On top of the first page of your answer sheet, please write the details exactly in the following format:

**You may reproduce the Course Code and Assignment Code from the assignment.**

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**ENROLMENT  
NO.:**

<b>PROGRAMME TITLE</b>	: .....	<b>NAME:</b> .....
<b>COURSE CODE</b>	: .....	<b>ADDRESS:</b> ..... ..... .....
<b>COURSE TITLE</b>	: .....	..... .....
<b>ASSIGNMENT CODE</b>	: .....	<b>SIGNATURE:</b> ..... .
<b>STUDY CENTRE</b>	: .....	<b>DATE:</b> .....

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**PLEASE FOLLOW THE ABOVE FORMAT STRICTLY TO FACILITATE  
EVALUATION AND TO AVOID DELAY.**

2. Use only foolscap size paper for your response and tie all the pages carefully. Avoid using very thin paper. Allow a 4 cm margin on the left and at least 4 lines in between each answer. This would facilitate the evaluator to write useful comments in the margin at appropriate places.
3. Write the responses in your own handwriting. Do not print or type the answers. Do not copy your answers from the Units/Blocks sent to you by the University. It is advised to write your answers in your own words as it will help in grasping the study material.
4. Do not copy from the response sheets of other students. If copying is noticed, the assignment will be rejected.
5. Write each assignment separately. All the assignments should not be written in continuity.
6. Write the question number with each answer.
7. **The completed assignment should be submitted within the due date** to the Coordinator of the Study Centre allotted to you. TMAs submitted at any other place and after due date will not be evaluated.
8. After submitting the TMA, get the acknowledgement from the Coordinator on the prescribed assignment remittance-cum-acknowledgement card. **We strongly suggest that you retain a copy of your answer sheets.**
9. In case you have requested for a change of Study Centre, you should submit your TMA only to the original Study Centre until the change of Study Centre is notified by the University.
10. This assignment is **valid from 1<sup>st</sup> January, 2024 to 31<sup>st</sup> December, 2024**. If you have failed in this assignment or fail to submit it by Dec, 2025, then you need to get the assignment for the year 2025, and submit it as per the instructions given in the Programme Guide.
11. **You cannot fill the examination form for this course** until you have submitted this assignment.

We wish you good luck.

## ASSIGNMENT

### BIOANALYTICAL TECHNIQUES

Course Code: **MBC-003**

Assignment code: **MBC-003/TMA/2024**

Maximum marks: **100**

**Note: Attempt all questions. The marks for each question are indicated against it.**

Write the answers in your own words; do not copy from the course material.

#### **PART-(A)**

Marks: 50

1. a) Define the following: [1 x 5=5]
- i) Buffers
  - ii) Parts per million (ppm)
  - iii) Resolving power
  - iv) Cryofixation
  - v) Sedimentation coefficient
- b) Explain the principle of Beer-Lambert law. [5]
- 2.a) Discuss the density gradient centrifugation. [5]
- b) Explain the working principle and basic components of fluorescence microscopy. [5]
- 3.a) Discuss Scanning Tunneling Microscope. [5]
- b) Compare ORD and CD Spectroscopy [5]
4. a) Write a brief account note on Laboratory safety rules. [5]
- b) Explain the following: [2.5 X 2 = 5]
- i) Homogenisation
  - ii) Freeze thaw
5. (a) How would you make the solutions of following concentration? [2.5x2=5]
- i) 100 ml of 0.5 M Sucrose solution
  - ii) 50 ml of 1 Normal solution of HCl.
- b) Discuss different methods of ionization in mass spectrophotometry, [5]

**PART- (B)**

**Marks: 50**

6. Differentiate between: **[5+5=10]**
- a) Affinity chromatography and Ion exchange chromatography
  - b) Northern and Southern technique
7. a) What are supporting media used in electrophoresis?. **[5]**
- b) Discuss the genomic in situ hybridization (GISH) technique. **[5]**
8. a) State are the major parts of the HPLC Liquid chromatography systems. **[5]**
- b) Describe SDS-PAGE and its significance in characterization of proteins. **[5]**
9. (a) Define radioisotopes half-life. Write applications of radioactivity. **[2+3=5]**
- b) Explain scintillation counting with suitable diagram.
10. Elaborate the principle and applications of the following: **[5+5=10]**
- a) LC/MS
  - b) UPLC