MBC-003

ASSIGNMENT BOOKLET

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

BIOANALYTICAL TECHNIQUES

Valid from 1st January, 2026 to 31st December, 2026

School of Sciences
Indira Gandhi National Open University
Maidan Garhi, New Delhi-110068
(2026)

Dear Student,

Please read the section on assignments in the Programme Guide for Core Courses that we sent you after your enrolment. A weightage of 30 per cent, as you are aware, has been earmarked for continuous evaluation, which would consist of one tutor-marked assignment for this course. The total marks of all the parts are 100, of which 35% are needed to pass it.

Instructions for Formatting Your Assignments

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.

ENROLMENT NO.:

PROGRAMME TITLE	**: .....**	**NAME: .....**	
COURSE CODE	**: .....**	**ADDRESS:.....**	
		.....	
COURSE TITLE	**: .....**	**.....**	
ASSIGNMENT CODE	**: .....**	**SIGNATURE:.....**	
STUDY CENTRE	**: .....**	**DATE: .....**	

PLEASE FOLLOW THE ABOVE FORMAT STRICTLY TO FACILITATE EVALUATIONAND 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 1st January, 2026 to 31stDecember, 2026**. If you have failed in this assignment or fail to submit it by Dec, 2027, then you need to get the assignment for the year 2026, 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/2026**
Maximum marks: **100**

Note: Attempt all questions. Write the answers in your own words; do not copy from the course material.

1. a) Define the following: [1x 5=**5]**

   i) Mole fraction
   ii) Stocks shift
   iii) Chromatogram
   iv) Half life of radioisotopes
   v) Resolving power

   b) Discuss the ionization of weak electrolytes with suitable example. **[5]**

2. a) What is density gradient centrifugation? Discuss briefly any of its method. **[5]**

   b) Write the basic principle and application of NMR Spectroscopy. **[5]**

3. a) Compare the ultrasonication and freeze thaw methods. **[5]**

   b) Write the basic components and application of Fluorescence spectrophtometry. **[5]**

4. a) What are Good Laboratory safety rules. Why they are important? **[5]**

   b) Write a brief account note on Bioluminescence and its use in microscopy. [**5]**

5. (a) How would you prepare the following laboratory solutions? [2.5x2= 5]

   i) 500 ml of 0.5 M Na_2CO3

   ii) 100 ml of 0.1 N of NaOH

   b) Elaborate the different application of electron microscopy. [5]

6. Differentiate between: **[5+5=10]**

   a) Gas Chromatography and HPLC
   b) Southern Blotting and Northern blotting

7. a) Describe SDS-PAGE technique. **[5]**

   b) Write an overview on Biological Hazard and its safety aspects. **[5]**

8. Describe the basic theory, components and applications of thin layer chromatography. **[10]**

9. a) Explain the steps and application of FISH technique with suitable diagram. [10**]**

10. Write short notes on the following: **[5+5=10]**

    a) Major types of ion sources of mass spectrometer.

    b) Ultra-Performance Liquid Chromatography (UPLC)