

MBC-002

ASSIGNMENT BOOKLET

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

CELL AND MOLECULAR BIOLOGY

Valid from January, 2025 to Dec, 2025



**School of Sciences
Indira Gandhi National Open University
Maidan Garhi, New Delhi-110068
(2025)**

Dear learners,

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 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.

ENROLMENT NO.:

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

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 1st January, 2025 to 31st December, 2025**. If you have failed in this assignment or fail to submit it by Dec, 2026, 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

Cell and Molecular Biology

Course Code: **MBC-002**

Assignment code: **MBC-002/TMA/2025**

Maximum marks: **100**

Note: Attempt all the questions. Write the answers in your own words; do not copy from the course material. Draw the figures/flowcharts/tables wherever required.

1. a) Define the following terms: [1x5=5]
 - i) Nucleoplasm
 - ii) Mitochondrial crista
 - iii) Photosynthesis
 - iv) Microtubules
- b) Write a brief account note on extracellular matrix (ECM). [5]
2. Describe the different cell adhesion molecules. [10]
3. a) What are the check points? Describe their role in regulation of cell cycle. [5]
- b) Differentiate between apoptosis and necrosis. [5]
4. a) Discuss the Singer and Nicholson's Model of Plasma membrane. [5]
- b) Explain: [2.5 X 2 = 5]
 - i) Cot Curve
 - ii) Pseudogenes
5. a) What are the different levels of packaging of DNA into higher order structures? Discuss. [5]
- b) Elucidate the rolling circle mechanism of DNA replication. [5]
6. Explain the structure and functions of the following: [5+5=10]
 - a) Helix-Turn-Helix (HTF) motif.
 - b) E. Coli DNA polymerase III
7. a) Briefly discuss the structure and roles of E. Coli. RNA polymerase. [5]
- b) Elaborate the post transcriptional RNA processing in eukaryotes? [5]
8. a) What is Wobble hypothesis? Write its significance. [5]
- b) Describe the steps involved in the initiation of bacterial translation [5]
9. Write a short note on the following: [5+5=10]
 - a) Mutation
 - b) Catabolite repression
10. a) Describe the modifications in DNA and Histones. [5]
- b) Discuss the regulation of gene involved in organism development. [5]