**MBC-007**

# ASSIGNMENT BOOKLET

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

**Bioinformatics and Biostatistics**

**Valid from July, 2025 to June, 2026**

**School of Sciences**
**Indira Gandhi National Open University**
**Maidan Garhi**
**New Delhi-110068.**

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.

**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:

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**ROLL NO.:** ……

**NAME:** ……

**ADDRESS:** ……

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**COURSE CODE:** …….

**COURSE TITLE:** …….

**ASSIGNMENT NO.:** ……..…

**STUDY CENTRE:** ……..….. **DATE:** …….……...

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

2) Use only foolscap size writing paper (but not of very thin variety) for writing your answers.

3) Leave 4 cm margin on the left, top and bottom of your answer sheet.

4) Your answers should be precise.

5) The assignment answer sheets are to be submitted to your Study Centre as per the schedule made by the study centre. **Answer sheets received after the due date shall not be accepted.**

   **We strongly suggest that you retain a copy of your answer sheets.**

6) This assignment is **valid from July, 2025 to June, 2026** and submit it as per the instructions given in the Programme Guide.

7) **You cannot fill the exam form for this course** till you have submitted this assignment.

We wish you good luck.

ASSIGNMENT

# Bioinformatics and Biostatistics

**Course Code: MBC-007**
**Assignment Code: MBC-007/TMA/2025**
**Maximum Marks: 100**

Answer **all the questions** given below.

1. Define bioinformatics. Discuss its interdisciplinary nature and major applications in biological research. (5+5) 10

2. Differentiate between sequence similarity, identity, and homology with suitable examples. 10

3. Describe the role and importance of biological databases. Classify them and give relevant examples. (5+5) 10

4. Explain various File formats used in bioinformatics with suitable examples. Why are standardized file formats important in bioinformatics? 10

5. Discuss the role of multiple sequence alignment tools like Clustal Omega and BLAST in comparative genomics. 10

6. Explain how do high-throughput data and omics technologies contribute to systems biology. 10

7. Illustrate how systems biology helps in understanding disease mechanisms and designing therapeutic strategies. 10

8. What is Systems Biology? Discuss how systems-level approaches are transforming modern biology. (5+5) 10

9. Discuss the differences between descriptive and inferential statistics with examples from biochemistry. (5+5) 10

10. Explain the concepts of probability distribution and hypothesis testing in the context of experimental biology. 10

**Note: Draw the figures/flowcharts/tables wherever required.**