

M. SC. (BIOCHEMISTRY)

(MSCBCH)

Term-End Examination

December, 2025

MBC-007 : BIOINFORMATICS AND

BIostatISTICS

Time : 3 Hours

Maximum Marks : 100

Note : (i) Answer any **five** questions.

(ii) All questions carry equal marks.

1. (a) Explain the importance of bioinformatics as an interdisciplinary subject and its application in modern biological research. 10
- (b) Write about different sequence file formats used in bioinformatics with suitable examples. 10

2. (a) What is biological database ? Explain any *two* databases with examples. 10
- (b) Define the term 'sequence alignment'. Discuss the different types of BLAST sequencing methods. 10
3. (a) Compare and contrast distance-based and character-based phylogenetic analysis methods. 10
- (b) Write the importance of sequence motif databases. Explain how these database contribute to the identification and analysis of protein families. 10
4. (a) Differentiate between bottom-up and top-down approaches for structure identification in systems biology. 10
- (b) Describe the concepts of soft redundancy and modular design in biological systems. 10
5. (a) Define modelling and list its types. Explain Boolean network model for single gene. 10

- (b) Explain the concept of separators in bioinformatics and discuss the challenges involved in their identification. 10
6. (a) With the help of a flow chart, explain various types of data used in biostatistics. 10
- (b) Describe the concept of probability in statistics with examples. 10
7. (a) Write short notes on any *two* of the following : 2×5=10
- (i) Regression
 - (ii) Skewness
 - (iii) Null hypothesis
- (b) Differentiate between probabilistic and non-probabilistic sampling schemes. 10

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