

M. SC. (BIOCHEMISTRY)

(MSCBCH)

Term-End Examination

June, 2026

MBCE-017 : OMICS

Time : 3 Hours

Maximum Marks : 100

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

(ii) All questions carry equal marks.

1. (a) Describe different approaches for genome mapping. 10
- (b) Explain the principle and basic steps of High-throughput DNA sequencing. 10
2. (a) Describe various software platforms for DNA data analysis. 10
- (b) Give a detailed overview of regulatory RNAs. 10

3. (a) Discuss the steps involved in sequencing of small RNA. 10
(b) Describe the principle and types of protein chip. 10
4. (a) What is DNA microarray ? Explain its experimental set up. 2+8
(b) Compare between pairwise sequence alignment and multiple sequence alignment. 5
(c) Write a note on gene prediction approaches. 5
5. Describe the functional genomics of the following experimental models (any two) : 10+10
(a) *Drosophila melanogaster*
(b) *Escherichia coli*
(c) *Caenorhabditis elegans*
6. Explain the following : 4×5=20
(a) Genomics
(b) Shot gun sequencing
(c) Proteomics
(d) Single cell transcriptomics

7. (a) Discuss the protein labelling techniques used for quantitative analysis. 10
- (b) List various visualization tools in proteomics. Explain any *two* softwares and their applications in detail. 10
8. Write short notes on the following : 10+10
- (a) Fundamental concept of metabolomics
- (b) Drug and natural databases
- (c) Molecular docking
- (d) Aim, importance and evolution of omics

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