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MBCE-017

M. SC. (BIOCHEMISTRY)

(MSCBCH)

Term-End Examination

December, 2025

MBCE-017 : OMICS

Time : 3 Hours *Maximum Marks : 100*

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

(ii) All questions carry equal marks.

1. (a) Define the following terms in **2-3** lines : 5×2=10

(i) Omics

(ii) Transcriptomics

(iii) Epigenomics

(iv) Pharmagenomics

(v) Microbiomics

(b) Discuss the structural organization of eukaryotic genome and gene structure with suitable diagrams. 5+5

2. (a) What is functional genomics ? Discuss any *one* experimental model used to study genomics. 2+8

(b) Explain the following techniques : 5+5

(i) Illumina sequencing

(ii) Nanopore DNA sequencing

3. Write short notes on the following : 4×5=20

(a) European Molecular Biology Laboratory

(b) National Center for Biotechnology Information

(c) Single cell transcriptomics

(d) RNA deep sequencing

4. (a) Differentiate between the following : 5+5

   (i) Single end sequencing and paired end sequencing

   (ii) Genomics and Proteomics

   (b) Describe DNA microarray, explaining its different types. 10

5. (a) Write the tools and packages used for data analysis in microarray. 10

   (b) Give an account of different techniques and their applications in proteomics. 10

6. (a) Explain the principle of mass spectrometry. Discuss MALDI-TOF technique with a suitable diagram. 10

   (b) What is quantitative proteomics ? Discuss any *one* technique used for it. 2+8

7. Write short notes on the following : 4×5=20

   (a) Protein Data Bank

   (b) Single cell metabolomics

   (c) Nuclear Magnetic Resonance Spectroscopy

   (d) Single cell transcriptomics

8. Describe molecular docking. List the name of various softwares used for docking studies. 20

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