

This question paper contains **3** printed pages]

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S. No. of Question Paper : **9559**

Unique Paper Code : **2533012013**

Name of the Paper : **Applications of Informatics in Biology (DSE)**

Name of the Course : **B.Sc. (Hons.) Microbiology**

Semester : **VII (Part-IV)**

Duration : **2 Hours**

Maximum Marks : **60**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt any *five* questions.

All questions carry equal marks.

1. Define the following (any *six*) :

2×6=12

- (i) Domain
- (ii) Accession number
- (iii) Systems Biology
- (iv) Functional genomics
- (v) Interactome
- (vi) Molecular docking
- (vii) Phylogeny
- (viii) Annotation.

2. (a) Expand the following (any *four*) :

1×4=4

(i) QSAR

(ii) DDBJ

(iii) IEDB

(iv) KEGG

(v) PDB.

(b) Name one database/tool for the following (any *four*) :

1×4=4

(i) Chemical database

(ii) Protein Structure

(iii) Allergen Prediction

(iv) Nucleotide sequences

(v) Multiple sequence alignment.

(c) Discuss the role of AI (or) Machine learning in disease management. 4

3. Differentiate between the following (any *three*) :

4×3=12

(i) Local sequence alignment and Global sequence alignment

(ii) Transcriptomics and Proteomics

(iii) FASTA and FASTQ

(iv) Rigid and Flexible Docking.

4. Write short notes on the following (any *three*) : 4×3=12
- (i) Human Genome
 - (ii) Types of biological database
 - (iii) Gene ontology
 - (iv) Ramachandran Plot.
5. (a) Describe the steps involved in Homology modelling. Name any *one* tool for homology modelling. 6
- (b) What are energy minimizations ? 2
- (c) Give a brief account of molecular dynamics simulations. 4
6. (a) What is CADD ? List the steps in structure-based drug design. 5
- (b) What is the significance of BLAST ? Name any *four* types of BLAST. 4
- (c) Align the following two sequences, if the Match score (+3), Mismatch score (-1) Gap penalty (-4). 3

CGGAATTGGC and GACGAAAGC

