PG Even Semester Exam, May 2025

Biotechnology

2nd Semester

COURSE NO. BTYCC - 553

[Bioinformatics]

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer five questions, taking one from each Unit

UNIT-I

1. What is bioinformatics? Write a note on different branches of bioinformatics. Discuss the objectives of bioinformatics. 2+8+4=14
2. Write a note on the applications of bioinformatics. Discuss the advantages of bioinformatics analysis. 8+6=14

UNIT-II

3. Write a note on biological databases commonly used in bioinformatics studies. Discuss the merits of each databases. 8+6=14

4. Write short notes on: 7+7=14
   a. Codon usage bias and its consequences.
   b. Peptide vaccine prediction using bioinformatics.

UNIT-III

5. What is sequence alignment? Describe the types, algorithms used, tools and applications of sequence alignment. 3+11=14
6. What is UPGMA method for the construction of phylogenetic tree? Prepare a phylogenetic tree based on distance method of the following sequences: 3+11=14
   a. GC GC GC TA
   b. GC CC CC TA
   c. CC GC CA TA
   d. GA AC GT TA
   e. AT GC GC GC

UNIT-IV

7. Write notes on the following: 7+7=14
   a. Exon chaining problem
   b. Ab initio method of gene prediction.
8. Describe the applications and challenges of full genome comparison with five examples of tools used for full genome prediction. 14

UNIT-V

9. Write notes on the following: 7+7=14
   a. Alfa fold method of protein prediction
   b. Protein ligand docking
10. Write notes on the following: 7+7=14
   a. Rosseta algorithm for protein prediction
   b. Tertiary structure of protein and bioinformatics tools for protein classifications.

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