B. Sc. (Hons.) Botany / Semester VI

Title of paper: Bioinformatics (DSE)

Unique Code : 32167608

Attempt four questions in all. All questions carry equal (18.75) marks.

Attempt all parts of the questions together.

Write your roll number on top of answer sheet.

1. Expand INSD and describe about this collaboration. Give a comparative account on the various data submission and retrieval tools of NCBI, EMBL and DDBJ. **(1+ 5.75 + 12)**
2. What are the tools available at NCBI for nucleotide sequence analysis? Enumerate your answer with flowchart/s / diagram/s. Explain the specialized tools of NCBI? Generate manually all the six reading frames, and identify different possible ORFs (marking the start and stop codon) for the given nucleotide sequence.

   CGCTACGTCTTACGCTGGAGCTCTCATGGATCGGTTCGGTAGGGCTCGATCACATCGCTAGCCAT

   (6+6.75+6)

3. What is multiple sequence alignment. Name two important tools used for multiple sequence alignment. Why scoring matrices are essential for multiple sequence alignment. Discuss various commonly used scoring matrices. (**1+2+5+10.75**)

4. Define Bioinformatics and name its closely related branches. Describe the aims and scopes in the area of bioinformatics. **(1+3+ 6+ 8.75)**

5. What is Molecular phylogeny and briefly enumerate the processes of constructing molecular phylogeny? Give a comparative account of the three main classes of phylogenetic methods for constructing phylogenies. **(2+6+10.75)**

6. Discuss the role of bioinformatics in crop improvement and microbial genome applications. **(9.25 +9.5)**