5 SEM TDC DSE BOT (CBCS) 2 (H)

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(Held in January/February, 2022)

BOTANY

(Discipline Specific Elective)

(For Honours)

Paper : DSE–2

(Bioinformatics)

Full Marks : 53
Pass Marks : 21

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

1. *(a)* Choose the correct answer of the
following :   1×3=3

   (i) The web-based sequence submis-
   sion tool of EMBL is Sakura /
   Webin / Entrez / Banklt.

(ii) The term Bioinformatics was coined by Hogeweg and Hesper / Margaret Dayhoff / Christian D. Wunsch / Temple F. Smith.

(iii) NCBI stands for National Center for Biotechnology Information / National Center of Biotechnological Information / National Council of Biological Information / National Council of Biotechnological Institute.

(b) Fill in the blanks :   1×2=2

(i) BLAST stands for _____.

(ii) The branching pattern of a phylogenetic tree is called _____.

2. Write on the following in short :   3×4=12

(a) SwissProt

(b) QSAR

(c) FASTA

(d) Percent Accepted Mutation

3. What is biological sequence alignment? Distinguish between local and global alignment. Also, write briefly on the dynamic programming method of biological sequence alignment.　　　　　2+2+8=12

Or

Align the following sequences using Needleman-Wunsch algorithm and find out the alignment score :　　　　　9+3=12

　　　Seq. 1 : ATGCTGTA

　　　Seq. 2 : ATCTATA

　　　where, Match score = +1; Mismatch = 0; Gap Penalty = −1

4. What are biological databases? What are the major functions of biological databases? With suitable examples, write briefly about different types of biological database. 2+2+8=12

Or

Define bioinformatics. What are the aim and scopes of it? Distinguish between Bioinformatics and Computational Biology.
　　　　　2+6+4=12

(4)

5. What is phylogenetic analysis? Define phylogenetic tree. Also write the types of phylogenetic tree. Write briefly the steps involved in the construction of a molecular phylogenetic tree. 2+1+4+5=12

Or

What does the acronym DDBJ stand for? Where is DDBJ located? What are the objectives of DDBJ? How to submit a sequence in DDBJ? 2+1+3+6=12

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