

M-4772051

1924/M

Paper-XVI
INTRODUCTION TO BIOINFORMATICS

Max. Marks: 75

Time Allowed: 3 Hours

Note: Candidates are required to attempt two questions each from sections A and B of the question paper and the entire section C.

SECTION-A

1. a) What is the scope of bioinformatics? Explain why it is a multi-disciplinary field. 7
b) Name any four ExPASy tools for proteomics and briefly state their applications. 8
2. a) Depict the salient features of prokaryotic and eukaryotic gene promoters. 8
b) Elucidate the following terms: datamining, datamining tools. 7
3. a) Write a comprehensive note on the major nucleotide sequence databases. 9
b) Write briefly on the following: Entrez, BankIt, Swiss-Prot. 6
4. a) Analyse the importance of REBASE, SCOP and Pfam databases. 8
b) Depict the composition and organization of BIOSILICO and KEGG databases. 7

SECTION-B

5. a) Give brief accounts of Smith Waterman and Semiglobal algorithms. 7
b) State the principles of BLASTn and BLASTp and statistical significance of scores. 8
6. a) How do you analyse a DNA sequence with regard to ORF and restriction sites? 8
b) Give a comprehensive account of protein domains and family classification. 7
7. a) Assess the importance and applications of some functional genomics tools. 8
b) List the Clustal series of programs and briefly state their applications. 7
8. a) State the approaches to study protein modifications and reverse translation. 8
b) How do you analyse protein 3D structures? 7

SECTION-C

9. Answer all the following short answer type questions:

10x1.5=15

- i) Depict the architecture of nuclear genome.
- ii) State the modular organization of a typical split gene.
- iii) What do you mean by composite databases?
- iv) Write a brief note on the PROSITE database.
- v) How do you predict the protein secondary structures?
- vi) Give an overview of gene identification methods.
- vii) How could you predict the pI value of a protein?
- viii) Give a brief account of Phylip programs.
- ix) How do you carry out peptide cleavage analysis?
- x) Highlight the importance and uses of RASMOL program.

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