

Sl. No. of Ques. Paper : 2089

GC-3

Unique Paper Code : 32493904

Name of Paper : (SEC-4): Bioinformatics

Name of Course : B.Sc. (Hons.) Bio-Chemistry (CBCS) Skill Enhancement Course

Semester : III

Duration : 2 hours

Maximum Marks : 50

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

Attempt all questions.

Use of scientific calculator / log tables may be allowed.

1. (i) Name the following:

- (a) A database for protein sequences
- (b) A visualization software for protein or DNA structures
- (c) A small molecule database
- (d) A DNA sequence database
- (e) A multiple sequence alignment tool
- (f) A secondary structure prediction tool.

(ii) Expand the following:

- (a) PDB
- (b) HTML
- (c) BLAST
- (d) OMIM
- (e) SNP
- (f) ORF
- (g) PAM
- (h) CADD.

(iii) Fill in the blanks:

- (a) ..... is a composite database.
- (b) An example of a metabolic pathway database is .....
- (c) Sequences with more than ..... % identity can be used as a template for homology modeling.

- (d) ..... is a unique number or code given to mark the entry of a sequence.
- (e) One commonly used scoring matrix for BLAST searches is .....
- (f) The ..... is a parameter that describes the number of hits one can “expect” to see by chance when searching a database of a particular size. 6,8,6
2. (i) Differentiate between the following (any *four*):
- (a) Primary and Secondary Databases
  - (b) Local and Global Alignment
  - (c) Dendogram and Cladogram
  - (d) Paralogs and Orthologs
  - (e) Pairwise and Multiple Sequence Alignment
  - (f) Similarity and Identity of aligned sequences
  - (g) Rooted and Unrooted Tree
  - (h)  $\alpha$ -helix and  $\beta$ -sheets
- (ii) What is Ramachandran Plot? Explain its significance. 12,3
3. (i) What are file formats? Name any *two* commonly used sequence file formats.
- (ii) Write short notes on (any *three*):
- (a) NCBI
  - (b) BLAST
  - (c) Homology Modeling
  - (d) Applications of Bioinformatics. 3,12