



**WEST BENGAL STATE UNIVERSITY**  
B.Sc. Programme 6th Semester Examination, 2022

**BOTGDSE03T-BOTANY (DSE2)**

**BIOINFORMATICS**

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.  
Candidates should answer in their own words and adhere to the word limit as practicable.  
All symbols are of usual significance.*

1. Answer **all** the questions briefly: 1×16 = 16
- (a) What is PIR?
  - (b) What is CLUSTAL W?
  - (c) What is FASTA?
  - (d) Define paralogs.
  - (e) What is proteomics?
  - (f) Define accession number.
  - (g) Expand PAM.
  - (h) What is consensus sequence?
  - (i) What are primary databases?
  - (j) Name two tools used in phylogenetic analysis.
  - (k) Which of the following accumulate mutation at higher rate: Noncoding or Coding DNA?
  - (l) What is an outgroup?
  - (m) What does EMBL stand for?
  - (n) Draw a rooted phylogenetic tree.
  - (o) What is meant by gap penalty?
  - (p) What is the full form of NCBI?
2. Answer any **eight** questions from the following: 3×8 = 24
- (a) Briefly state the application of bioinformatics. 3
  - (b) What is the difference between structural and functional genomics? 3
  - (c) What do you understand by sequence alignment? Differentiate between global and local alignment. 1+2

- (d) Name the tools (at least two) used for pairwise sequence alignment and multiple sequence alignment. 3
- (e) Compare the advantages and disadvantages of pairwise and multiple sequence alignment using DNA. 3
- (f) Define the different parameters obtained after running BLAST. 3
- (g) Name the two methods based on which phylogenetic trees can be constructed. What is the difference between UPGMA and NJ method? 1+2
- (h) Explain monophyletic group, paraphyletic group and polyphyletic group with the help of a diagram. 1+1+1
- (i) What is bootstrap test? What are its application and limitation? 1+2
- (j) Compare PAM and BLOSUM matrices. 3
- (k) Define the following terms:
- (i) Target in drug designing
  - (ii) Virtual screening
  - (iii) Lead optimization.
- (l) What is genomics? How does bioinformatics support genomic research?

**N.B. :** *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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