



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

**BOTADSE05T-BOTANY (DSE3/4)**

**BIOINFORMATICS**

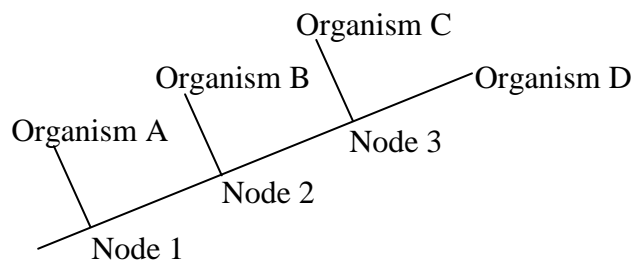
Time Allotted: 2 Hours

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 following questions briefly: 1×16 = 16

- (a) What is a cladogram?
- (b) Define orthologs.
- (c) What is dynamic programming?
- (d) What is CLUSTAL W?
- (e) Name a software used to create phylogenetic tree.
- (f) Define FASTA.
- (g) Name the NCBI database for transcriptomic data.
- (h) Name two tools used in phylogenetic analysis.
- (i) What is consensus sequence?
- (j) Define molecular docking.
- (k) What is MSA?
- (l) In the diagram which node represents the most recent common ancestor for organism B and C?



- (m) What is e-value of alignment score?
- (n) Which kind of mutation is more likely to be encountered: Transition or transversion?
- (o) Expand DDBJ.
- (p) Define topology.

2. Answer any **eight** questions from the following: 3×8 = 24
- (a) What is PIR? Describe the various resources of PIR. 1+2
- (b) What do you understand by sequence alignment? Differentiate between global and local alignment. 1+2
- (c) Discuss the importance of publically available biological databases in Bioinformatics. 3
- (d) State principle of parsimony. What are the basic premises of concept of biological parsimony? 1+2
- (e) What is Bootstrap test? What are its application and limitations? 1+2
- (f) What is bioinformatics? Mention its role in crop improvement. 1+2
- (g) Give one example each of (i) Nucleotide database, (ii) Protein database, (iii) Gene expression database.
- (h) What is a BLAST tool used for? What is the format used for submitting a sequence in a search base? Name the type of blast program used for proteins and nucleotide sequences. 1+1+1
- (i) Briefly explain how PAM is derived. 1+2
- (j) What is genomics? How does bioinformatics support genomic research? 1+2
- (k) Explain monophyletic group, paraphyletic group and polyphyletic group with the help of a diagram. 1+1+1
- (l) Define the following terms: 1+1+1
- (i) Lead compound
- (ii) CADD
- (iii) Virtual screening.

**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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