



## WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 6th Semester Examination, 2021

### BOTADSE05T-BOTANY (DSE3/4)

#### BIOINFORMATICS

Time Allotted: 2 Hours

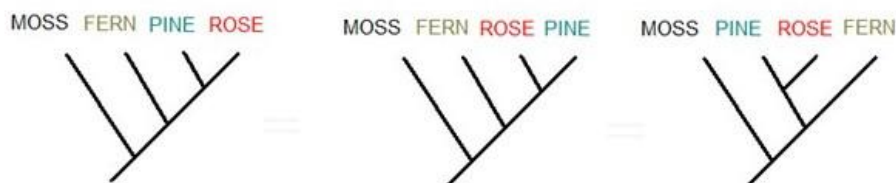
Full Marks: 40

*The figures in the margin indicate full marks.*

*Candidates should answer in their own words and adhere to the word limit as practicable.*

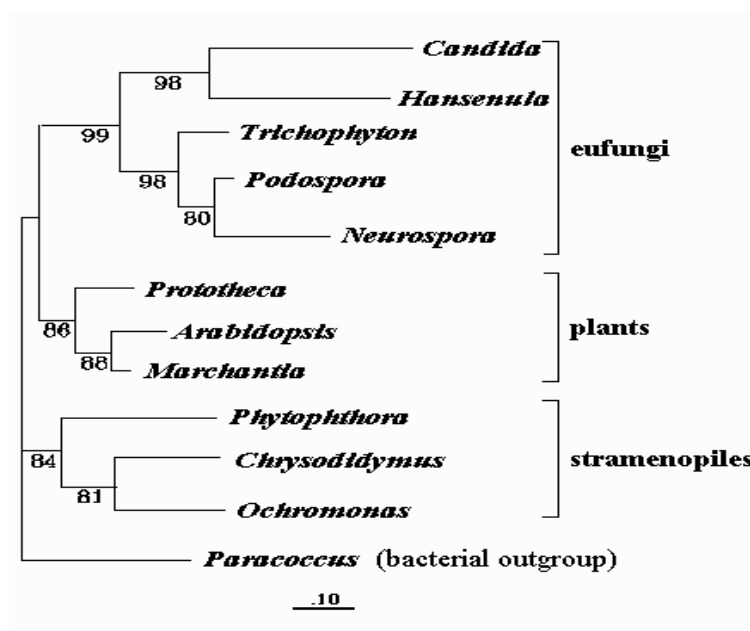
1. Answer **all** the following questions briefly: 1×16 = 16

- (a) What does NCBI stand for?
- (b) What does in-silico mean?
- (c) Name any two major public DNA databases.
- (d) What is the purpose of using ClustalW?
- (e) Why is the error of the unrooted tree topology smaller than that of the rooted tree?
- (f) What is an accession number?
- (g) What is PAM?
- (h) What is the term used for a compound that has desirable properties to become a drug?
- (i) What is synapomorphy?
- (j) Name a software used to create a Phylogenetic tree.
- (k) What does a topology in a phylogenetic tree indicate? Is the tree topology in the figure given below similar?



- (l) Name a data retrieving tool.
- (m) What do you understand by the term informative site?
- (n) What type of knowledge database is UniProt ?
- (o) What is transcriptomics?
- (p) Name a software used to predict the structure of the protein from a given amino acid sequence.

2. Answer any **eight** questions from the following: 3×8 = 24
- (a) Distinguish between a cladogram and a phenogram. 3
- (b) Differentiate between orthologs and paralogs. 3
- (c) Are the terms similarity and homology the same? Explain with the help of an example. 1+2
- (d) What is FASTA? How is it represented? 3
- (e) What is molecular clock hypothesis? Name the algorithm that uses it to build a phylogenetic tree. Name a biomarker (gene) that is most popularly used for preparation of phylogenetic trees in eukaryotic organisms. 3
- (f) Write a short note on application of Bioinformatics in crop improvement. 3
- (g) Write a short note on Primary and Secondary Biological Database. 3
- (h) Mention the importance of bioinformatics tools in drug design and discovery. 3
- (i) In the figure given below identify 1+1+1
- (I) the out-group
- (II) any one polyphyletic group
- (III) mention the significance of numerical values.



- (j) What is molecular docking? Mention its application. 1+2
- (k) What is a database? Mention the different types of protein sequence databases. Give an example of each type. 1+2
- (l) What is Proteomics? Write a short note elaborating further on functional and structural proteomics. 3

**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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