



**2022/TDC/ODD/SEM/
BOTDSE-501T(A/B)/145**

TDC (CBCS) Odd Semester Exam., 2022

BOTANY

(5th Semester)

Course No. : BOTDSE-501T

Full Marks : 50

Pass Marks : 20

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

Candidates have to answer *either* from Option—A
or Option—B

OPTION—A

Course No. : BOTDSE-501T (A)

(Analytical Techniques in Plant Science)

UNIT—I

1. Answer any *three* of the following : 1×3=3

- (a) What is confocal microscopy?
- (b) What is the magnification of electron microscopy?
- (c) What is freeze etching?
- (d) What is freeze fracture?



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2. Answer any *one* of the following : 2

- (a) Differentiate between light microscopy and electron microscopy.
- (b) Write about cryofixation.

3. Answer any *one* of the following : 5

- (a) Give a detailed account of transmission electron microscopy (TEM).
- (b) Describe briefly fluorescence microscopy and its applications.

UNIT—II

4. Answer any *three* of the following : 1×3=3

- (a) Define centrifugation.
- (b) What is autoradiography?
- (c) What is analytical centrifugation?
- (d) Define density gradient centrifugation.

5. Answer any *one* of the following : 2

- (a) Write the principle of pulse chase experiment.
- (b) Write about marker enzymes.

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6. Answer any *one* of the following : 5

- (a) Write a note on differential centrifugation.
- (b) Give a detailed account of ultracentrifugation.

UNIT—III

7. Answer any *three* of the following : 1×3=3

- (a) What is R_f ?
- (b) What is stationary phase?
- (c) What is mobile phase?
- (d) What do you mean by GLC?

8. Answer any *one* of the following : 2

- (a) Write a note on ion-exchange chromatography.
- (b) Write about TLC.

9. Answer any *one* of the following : 5

- (a) Give an account of general aspects of chromatography.
- (b) Give an illustrated account of HPLC.



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UNIT—IV

10. Answer any *three* of the following : $1 \times 3 = 3$

- (a) Define mass spectrometry.
- (b) Name a technique for protein identification.
- (c) Mention two uses of mass spectrometry.
- (d) Define nucleotides.

11. Answer any *one* of the following : 2

- (a) Write a note on characterisation of proteins.
- (b) Give a brief account of AGE.

12. Answer any *one* of the following : 5

- (a) Describe briefly X-ray diffraction and its uses.
- (b) Give a detailed account of PAGE.

UNIT—V

13. Answer any *three* of the following : $1 \times 3 = 3$

- (a) Define data.
- (b) What is sample?
- (c) What is statistics?
- (d) Define parameter.

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14. Answer any *one* of the following : 2

- (a) Write a note on arithmetic mean.
- (b) Give an account of range.

15. Answer any *one* of the following : 5

- (a) Write notes on : $2\frac{1}{2} + 2\frac{1}{2} = 5$
 - (i) Median
 - (ii) Mode
- (b) Give a detailed account of chi-squared test for goodness of fit.

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(Turn Over)



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OPTION—B

Course No. : BOTDSE-501T (B)

(**Bioinformatics**)

UNIT—I

1. Answer any *three* of the following : 1×3=3
 - (a) What is bioinformatics?
 - (b) Give the full form of NCBI.
 - (c) Name a nucleotide database.
 - (d) Name the different branches of bioinformatics.
2. Answer any *one* of the following : 2
 - (a) Classify the biological database with examples.
 - (b) Write a note on protein data bank (PDB).
3. Answer any *one* of the following : 5
 - (a) Write a note on biological database retrieval system.
 - (b) What are the different aspects of bioinformatics including aim and scopes?

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UNIT—II

4. Answer any *three* of the following : 1×3=3
 - (a) Give the full form of BLAST.
 - (b) Name the database of literature from MEDLINE.
 - (c) What does PIR stand for?
 - (d) Write the full form of DDBJ.
5. Answer any *one* of the following : 2
 - (a) What is the procedure for sequence submission to NCBI?
 - (b) Write two salient features of SWISS-Port.
6. Answer any *one* of the following : 5
 - (a) What are the different steps for performing BLAST?



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(b) Write notes on :

- (i) EMBL Bank
- (ii) Protein Information Resource

UNIT—III

7. Answer any *three* of the following : $1 \times 3 = 3$

- (a) Which alignment is suitable for aligning closely related sequence?
- (b) Write a name of sequence alignment tool.
- (c) Global alignment is based on which algorithm?
- (d) Which alignment method is suitable for finding out conserved patterns in DNA?

8. Answer any *one* of the following : 2

- (a) What is multiple sequence alignment?
- (b) Write about BLOSUM.

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9. Answer any *one* of the following : 5

- (a) Write a note on MSA by CLUSTAL W.
- (b) Write a note on the different types of sequence alignment methods.

UNIT—IV

10. Answer any *three* of the following : $1 \times 3 = 3$

- (a) What are population trees?
- (b) Write the name of a software used for phylogenetic analysis.
- (c) What is phylogeny?
- (d) What do you mean by common ancestor in phylogenetic tree?

11. Answer any *one* of the following : 2

- (a) What are the different types of phylogenetic trees?
- (b) What limitation do molecular phylogenies have?



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12. Answer any one of the following : 5

- (a) Write a note on the methods employed in phylogenetic analysis.
- (b) What is the significance of molecular phylogenetic analysis?

UNIT—V

13. Answer any three of the following : 1×3=3

- (a) Write the full form of QSAR.
- (b) What are the two main different aspects of drug discovery?
- (c) Name a docking software.
- (d) What does ADMET stand for?

14. Answer any one of the following : 2

- (a) What is Lipinski rule of five?
- (b) Write two applications of bioinformatics in drug discovery.

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15. Answer any one of the following : 5

- (a) How are bioinformatics techniques used for crop improvements?
- (b) Write a note on computer-aided drug designing.

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