Reg. No. : ....

Name : ....

**III Semester M.Sc. Degree (CBSS – Reg./Supple./Imp.) Examination,
October 2023
(2020 Admission Onwards)
PLANT SCIENCE
PSB3C09 : Plant Physiology and Biochemistry**

Time : 3 Hours

Max. Marks : 60

*Instruction : Draw diagrams **wherever** necessary.*

SECTION – A

Answer **any two** questions; **one** from **each** bunch : **(2×8=16)**

1. A) Discuss the structure of protein. Add a note on its biological importance.

    OR

    B) Describe the biological nitrogen fixation in plants.

2. A) Give an account of secondary metabolites. Add a note on their physiological role and significance.

    OR

    B) Give an elaborate account of genetic and hormonal regulation of development.

SECTION – B

Answer **any three** questions : **(3×5=15)**

3. Write the schematic representation of cyclic and non-cyclic photophosphorylation.

4. Elucidate the mechanism of opening and closing of stomata.

5. What are the mechanisms by which mineral ions are absorbed by roots ?

6. What is GOGAT pathway ?

7. Write a short note on photomorphogenesis.

P.T.O.

SECTION – C

Answer **any five** questions : (5×3=15)

8. Explain seed dormancy and germination.

9. Enumerate the ecological significance of CAM metabolism.

10. What are the different strategies adopted by plants for tolerating heat stress ?

11. Explain photorespiration.

12. What is meant by Phloem loading ?

13. What are cryptochromes ?

14. Explain the structure of $CF_0 – CF_1$ complex.

15. Enumerate the functions of carbohydrates.

SECTION – D

Answer **any seven** questions : (7×2=14)

16. What are antiauxins ?

17. What is leghemoglobin ?

18. Comment on phytoalexins.

19. What are LHCs ?

20. Define a tetrasaccharide. Give one example.

21. What are oligosaccharides ?

22. What are channel proteins ?

23. What is Kranz anatomy ?

24. Explain the functions of RUBISCO.

25. Write critical note on allosteric enzymes with examples.

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Reg. No. : ....

Name : ....

III Semester M.Sc. Degree (CBSS – Reg./Sup./Imp.)
Examination, October 2022
(2020 Admission Onwards)
PLANT SCIENCE
PSB3C10 : Angiosperm Morphology and Systematics

Time : 3 Hours   Max. Marks : 60

Instruction : *Draw diagrams **whenever** necessary.*

SECTION – A

Answer **any two** questions; **one** from **each** bunch.   **(2×8=16)**

1. A) Explain the concept of primitive angiosperm flower and give an account of the theories that explain the origin of angiosperms.

OR

   B) Explain the historical development of plant taxonomy in India.

2. A) Write an essay on Herbarium preparation, its role in taxonomy and major herbarias of India.

OR

   B) Write an essay on the major centres of taxonomic and floristic studies in India.

SECTION – B

Answer **any three** questions.   **(3×5=15)**

3. What is placentation ? Discuss the evolution of placentation types.

4. What are taximetrics ? Mention its applications in taxonomy.

5. Write an account on Molecular Taxonomy.

6. Discuss the concept of species.

7. Write an account on effective and valid publications.

SECTION – C

Answer **any five** questions. (5×3=15)

8. Explain the Englerian concept of primitive flower.

9. Define obdiplostemonous condition. How does it form ?

10. Discuss the contributions of William Roxburgh in Indian Plant Taxonomy.

11. Discuss about the role of Botanical Gardens in taxonomy and biodiversity conservation.

12. Write an account of *Flora of British India* and *Flora of Presidency of Madras*.

13. Write an account on Biosystematics.

14. Write an account on the rule of Priority and its limitations.

15. Distinguish between Monophyly and Polyphyly.

SECTION – D

Answer **any seven** questions. (7×2=14)

16. What are nectaries ?

17. What are conduplicate carpels ?

18. Discuss essentialist concept in plant classification.

19. Write short notes about 'CAL' and 'MH'.

20. What is meant by character and character state ?

21. Explain the sources of taxonomic characters in relation to cytology.

22. Distinguish between Taxonomic species concept and Biological species concept.

23. Explain eFloras with suitable examples.

24. Write notes on Basionym and Synonym.

25. Discuss about the nomenclature of cultivated plants.

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K23N 0245

Reg. No. : ....

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III Semester M.Sc. Degree (C.B.S.S. – Reg./Supple./Imp.) Examination, October 2023
(2020 Admission Onwards)
PLANT SCIENCE
PSB3C10 : Angiosperm Morphology and Systematics

Time : 3 Hours

Max. Marks : 60

Instruction : *Draw* diagrams *whenever* necessary.

SECTION – A

Answer **any two** questions; **one** from **each** bunch :

(2×8=16)

1. A) Write an essay on the origin and evolution of carpels and placentation types in angiosperms.

   OR

   B) Write an essay on the APG system of classification.

2. A) Describe the organization and functions of Botanical Survey of India.

   OR

   B) Write an essay on the sources of taxonomic characters.

SECTION – B

Answer **any three** questions :

(3×5=15)

3. Substantiate the anatomical evidences of evolution of flowers.

4. Discuss the concept of genus and family.

5. Discuss about Revisions and Monographs.

6. Write an account on the major Botanical Gardens of India.

7. Write an account on the Management of Herbaria.

SECTION – C

Answer **any five** questions : **(5×3=15)**

8. What are nectaries ? Briefly explain Fahn's classification of nectaries.

9. Elucidate the concept of primitive flower with suitable examples.

10. Discuss the contributions of Santapau in plant taxonomy.

11. Briefly describe the major herbaria in India and Abroad.

12. What is a Synonym ? Which are the types of Synonyms ?

13. Write a note on the online databases.

14. Write an account on Cladistics.

15. Distinguish between Homology and Analogy.

SECTION – D

Answer **any seven** questions : **(7×2=14)**

16. Explain Gonophyll theory.

17. What is a flower ?

18. Discuss empirical species concept.

19. Write an account on *Hortus Malabaricus*.

20. Distinguish between Plesiomorphic and Apomorphic characters.

21. Explain the sources of taxonomic characters in relation to Phytochemistry.

22. Write a brief account on the concept of family.

23. Distinguish between valid and effective publications.

24. Write a short note on conserved names.

25. Define Paraphyly.

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K22N 0146

Reg. No. : ....

Name : ....

III Semester M.Sc. Degree (CBSS – Reg./Sup./Imp.) Examination, October 2022
(2020 Admission Onwards)
PLANT SCIENCE
PSB3C11 : Basic Bioinformatics

Time : 3 Hours

Max. Marks : 60

Instruction : *Draw diagrams* ***wherever*** *necessary.*

SECTION – A

Answer **any two** questions; **one** from **each** bunch. **(2×8=16)**

1. A) Give a detailed account of eukaryotic genomes with special reference to model organisms.

   OR

   B) Discuss on the scoring matrices used for nucleic acid and amino acid sequencing.

2. A) Give an account on the protein sequence and sequence motifs databases.

   OR

   B) Explain the different methods of transcriptome analysis.

SECTION – B

Answer **any three** questions : **(3×5=15)**

3. Write notes on secondary storage devices.

4. What are different tools and techniques used in computer networking ?

5. Write a short note on Python.

6. Distinguish between homologous, orthologous and paralogous sequences.

7. Give an account of algorithms used in sequence alignment.

P.T.O.

SECTION – C

Answer **any five** questions : **(5×3=15)**

8. List out the input and output devices of a computer.

9. Add notes on Graphical User interface.

10. What are external network cards ?

11. What are the different types of control statements used in Python programming ?

12. What are patent databases ? Give examples.

13. Differentiate between PAM and BLOSUM matrices.

14. List out the major applications of sequence analysis.

15. Write notes on microarray.

SECTION – D

Answer **any seven** questions : **(7×2=14)**

Expand and explain the following acronyms.

16. PROM

17. FTP

18. ISDN

19. RCSB

20. PERL

21. TAIR

22. ORF

23. MEGA

24. GCG

25. Muscle.

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Reg. No. : ....

Name : ....

III Semester M.Sc. Degree (C.B.S.S. – Reg./Supple./Imp.) Examination, October 2023
(2020 Admission Onwards)
PLANT SCIENCE
PSB3C11 : Basic Bioinformatics

Time : 3 Hours

Max. Marks : 60

Instruction : *Draw diagrams **wherever** necessary.*

SECTION – A

Answer **any two** questions, **one** from **each** bunch.

(2×8=16)

1. A) Give an account of various types of programming languages used in bioinformatics.

    OR

   B) Explain the different types of file formats for biomolecular sequences.

2. A) Give an elaborative account of different types of biological data used in bioinformatics.

    OR

   B) Give a detailed account of concepts and applications of sequence analysis.

SECTION – B

Answer **any three** questions.

(3×5=15)

3. Briefly explain the different types of operating systems.

4. Add notes on the different types of computer networks.

5. Define bioinformatics and mention its significance.

6. Explain the different types of tools used in multiple sequence alignment.

7. Write a description on the nature of data used in taxonomy and phylogeny.

SECTION – C

Answer **any five** questions. **(5×3=15)**

8. Write a short note on different generations of computers.

9. What are the different types of secondary storage devices of a computer ?

10. Write notes on the major types of network software.

11. What are the different types of molecular data ?

12. How do file reading and writing is being done in Python programming ?

13. Explain the concept of sequence homology.

14. Differentiate between distance and similarity matrix.

15. Write notes on RNA structure prediction tools.

SECTION – D

Answer **any seven** questions. Expand and explain the following acronyms. **(7×2=14)**

16. SMPS

17. DSL

18. Wi-Fi

19. DDBJ

20. KEGG

21. UniMES

22. BLOSUM

23. PHYLIP

24. T-Coffee

25. NBRF-PIR

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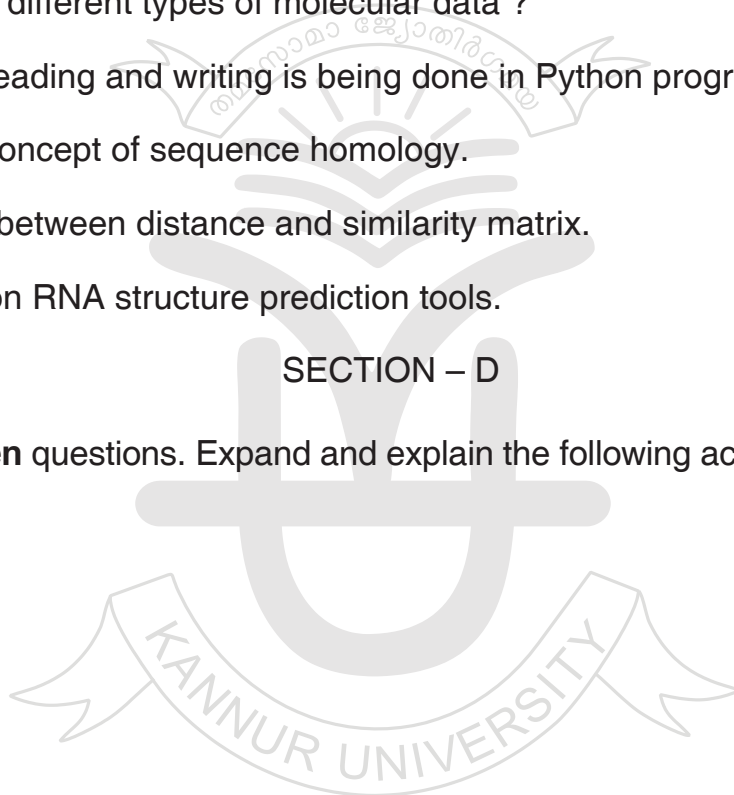
K22N 0147

Reg. No. : ....

Name : ....

III Semester M.Sc. Degree (CBSS – Reg./Sup./Imp.) Examination, October 2022
(2020 Admission Onwards)
PLANT SCIENCE
PSB3C12 : Structural Bioinformatics

Time : 3 Hours   Max. Marks : 60

Instruction : *Draw diagrams* **wherever** *necessary.*

SECTION – A

Answer **any two** questions; **one** from **each** bunch :   **(2×8=16)**

1. A) Give a detailed account on the basic principles of various spectroscopic methods for structure determination.

   OR

   B) Discuss the methods of prediction of secondary structure of proteins.

2. A) Discuss the types of DNA-Protein interactions. Add a note on the different biological processes involving DNA-Protein interactions.

   OR

   B) Explain the various stages and significance of Computer Aided Drug Design.

SECTION – B

Answer **any three** questions :   **(3×5=15)**

3. Give an account on non-bonded interactions in biological molecules.

4. Discuss the features of different molecular structure visualization tools.

5. Describe the principles and applications of X-ray crystallography.

6. Describe the role of pharmacogenomics in healthcare.

7. Give an account on precise genome editing techniques.

P.T.O.

SECTION – C

Answer **any five** questions : **(5×3=15)**

8. Briefly describe the structural organization of proteins.

9. Summarize the significance of Ramachandran plot in structural biochemistry.

10. Explain Bragg's law.

11. Outline the steps in homology modeling.

12. Give a brief account on chemical databases.

13. Define SBDD. How it is useful in drug designing ?

14. Summarize the concept and techniques of molecular docking.

15. Explain the *Ab initio* method of protein structure prediction.

SECTION – D

Answer **any seven** questions : **(7×2=14)**

16. Define essential amino acids. Give any two examples.

17. What are simple proteins ? Give any two examples.

18. What are histones ? Explain the role of histones.

19. What is meant by pharmacophore modeling ?

20. Distinguish between powder diffraction and single crystal diffraction.

21. Define DNA microarrays. Enumerate its applications.

22. What is atomic scattering factor ?

23. Explain the significance of homology modeling in protein structure prediction.

24. Write down the features of Cn3D tool.

25. Write a short note on combinatorial library.

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Reg. No. : ....

Name : ....

III Semester M.Sc. Degree (CBSS – Reg./Supple./Imp.) Examination, October 2023
(2020 Admission Onwards)
Plant Science
PSB3C12 : STRUCTURAL BIOINFORMATICS

Time : 3 Hours   Max. Marks : 60

*Instruction : Draw diagrams **wherever** necessary.*

SECTION – A

Answer **any two** questions; **one** from **each** bunch.   (2×8=16)

1. A) Explain various stages involved in computer aided drug design.

     OR

   B) Characterize the protein-protein interactions and discuss any four methods used for detecting it. Add a note on its role in proteomics.

2. A) Write an essay about the various tools used in molecular structure visualization.

     OR

   B) Explain the fundamentals of X-ray crystallography. Include a note about its bioinformatics applications.

SECTION – B

Answer **any three** questions.   (3×5=15)

3. What is a DNA microarray ? How does a DNA microarray work ?

4. Give an account on Chou-fasman method and GOR method.

P.T.O.

5. Explain the various non-bonding molecular interactions.

6. Describe the significance of ADMET prediction in drug development. Add a note on any two bioinformatics tools used for ADMET prediction.

7. Elaborate on the principles of UV-visible spectroscopy. Examine its role in molecular structure determination.

SECTION – C

Answer **any five** questions. (5×3=15)

8. Define molecular docking. Add a note on any two docking tools.

9. What is cryo-electron microscopy ? Investigate its role in structure determination.

10. Explain how proteins are categorised on the basis of chemical composition.

11. Outline the role of pharmacoproteomics in the development of personalized medicine.

12. Define a dihedral angle. Mention the way to visualize the dihedral angles.

13. How is the Q3 score useful in bioinformatics ?

14. Summarize the principle of CRISPR/Cas9 genome editing technique.

15. What is QSAR ? Emphasize its significance in drug discovery.

SECTION – D

Answer **any seven** questions. (7×2=14)

16. Mention the applications of IR spectroscopy.

17. Enumerate the different steps in homology modelling.

18. Define metallic bonding. How it differs from ionic bonding ?

19. Name any two DNA binding proteins.

20. Define synthetic biology. Which is the first synthetic bacterial genome ?

21. Characterize any two chemical databases that you have studied.

22. Evaluate the role of NMR spectroscopy in protein structure determination.

23. What is high throughput screening ?

24. List out the major features of Swiss PDB viewer.

25. Write a brief summary of the major features of protein tertiary structure.

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