

**MSc DEGREE END SEMESTER EXAMINATION- MARCH 2025****SEMESTER 4 : BOTANY****COURSE : 21P4BOTT14 : GENOMICS, PROTEOMICS AND BIOINFORMATICS***(For Regular - 2023 Admission and Supplementary 2022/2021 Admissions)*

Duration : Three Hours

Max. Weights: 30

**PART A****Answer any 8 questions****Weight: 1**

1. Discuss about SNP? (R, CO 1, CO 2, CO 3)
2. Give an account on gene prediction strategies. (U, CO 5)
3. Define orthologs and paralogs and explain how they contribute to understanding evolution. (A, CO 4)
4. Provide the practical significances of drug designing. (U, CO 4, CO 5)
5. Expand and explain the use of GFP in biomedical research.. (U, CO 4)
6. What is meant by homology? How is it classified? (U, CO 4)
7. Give the importance and features of PDB. (U, CO 3, CO 4, CO 5)
8. Define Phylogeny and its types. (U, CO 4, CO 5)
9. Discuss about the role of linkage group and linkage map in physical mapping. (A, CO 1, CO 2)
10. What is the significance of gene annotation in functional genomics? (U, CO 3)  
**(1 x 8 = 8)**

**PART B****Answer any 6 questions****Weights: 2**

11. Write a brief note on mRNA profiling. (U, CO 3)
12. Describe the dot matrix method in detail with its advantages and disadvantages. (U, CO 5)
13. Write a note on restriction mapping using STS. (U, CO 2)
14. Compare micro, mini and macro satellite. (U, CO 2)
15. Differentiate function driven and sequence driven metagenomics. (U, CO 4)
16. Explain gene expression analysis using microarray. (U, CO 3)
17. Describe quantitative PCR and its applications. (Cr)
18. What is the principle and applications of 2D gel electrophoresis. (U, CO 3, CO 4, CO 5)  
**(2 x 6 = 12)**

**PART C****Answer any 2 questions****Weights: 5**

19. Describe elaborately about the sequence retrieval of a gene from a database and its phylogenetic tree construction. Make an imaginary tree, label and comment on it. (E, CO 5)
20. Illustrate and compare in detail the library preparation in various NGS technologies. (A, CO 1, CO 2, CO 3)

21. Discuss about various techniques used for the determination of gene functions. (A, CO 3)
22. Explain various types of molecular markers and their application in construction of physical maps of a genome. (A, CO 2, CO 4)  
(5 x 2 = 10)

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.
CO 1	Compile and explain the history of genomics and the revolution happened in the field	U	1, 9, 20	7
CO 2	Distinguish the ancient and modern techniques to understand the structural features of genome	A	1, 9, 13, 14, 20, 22	16
CO 3	Elaborate the modern principles of functional genomics	An	1, 7, 10, 11, 16, 18, 20, 21	19
CO 4	Simplify the evolutionary studies using the genomics tools and appraise the social and ethical issues with a scientific temper	E	3, 4, 5, 6, 7, 8, 15, 18, 22	15
CO 5	Formulate the genomic studies using the fundamentals of bioinformatics	A	2, 4, 7, 8, 12, 18, 19	13

Cognitive Level (CL): Cr - CREATE; E - EVALUATE; An - ANALYZE; A - APPLY; U - UNDERSTAND; R - REMEMBER;