

M. Sc. DEGREE END SEMESTER EXAMINATION - MARCH 2026**SEMESTER 4 : BOTANY****COURSE : 24P4BOTT14 : GENOMICS, PROTEOMICS AND BIOINFORMATICS***(For Regular 2024 Admission)*

Time : Three Hours

Max. Weights: 30

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

1. Write a note on factors affecting molecular Phylogeny. (U, CO 5)
2. Explain the importance of electron gun in Mass Spectrometry? (U, CO 3)
3. What is the significance of gene annotation in functional genomics? (U, CO 3)
4. Write an note on Banana genome project. (U, CO 2)
5. Write a short note on paralogs with examples. (U, CO 4)
6. Describe any two types of BLAST in detail. (U, CO 5)
7. Write a note on (a) RFLP (b) RAPD (U, CO 2)
8. Provide any five commands used in Rasmol. (R, CO 5)
9. What is the significance of Metagenomics? (U, CO 4)
10. Differentiate between drug discovery and drug designing. (U, CO 5)

(1 x 8 = 8)**PART B****Answer any 6 questions****Weights: 2**

11. Compare Local and global alignment with the help of hypothetical sequences. Provide the applications. (U, CO 5)
12. Explain how transcriptome sequencing can be used in plant pathogen interaction studies. (An, CO 3)
13. Explain the hierarchal shot gun sequencing. (R, CO 1, CO 2)
14. What are the two approaches used in metagenomics? (U, CO 4)
15. Differentiate CHIP-seq from RNA-seq. (U, CO 3)
16. Briefly explain the gene expression analysis using dot blotting. (U, CO 3)
17. What is meant by linkage map and how is it constructed? (U, CO1 ,CO 2)
18. Differentiate between Forward Phase Arrays (FPA) and Reverse Phase Arrays (RPA). (U, CO 3)

(2 x 6 = 12)**PART C****Answer any 2 questions****Weights: 5**

19. Discuss the various NGS techniques employed for sequencing of DNA. (U, CO 1)
20. Describe elaborately the sequence retrieval of a gene from a database and its phylogenetic tree construction. Make an imaginary tree, label and comment on it. (An, CO 2, CO 5)

21. Explain various types of molecular markers and their application in construction of physical maps of a genome. (U, CO 1)
22. Discuss the various techniques used for the functional characterization of a gene. (U, CO 3)

(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	12, 17, 19	12
CO 2	Distinguish the ancient and modern techniques to understand the structural features of genome	An	4, 7, 12, 18	9
CO 3	Elaborate the modern principles of functional genomics	A	2, 3, 11, 14, 15, 16, 20	15
CO 4	Simplify the evolutionary studies using the genomic tools and appraise the social and ethical issues with a scientific temper	E	5, 13	3
CO 5	Formulate the genomic studies using the fundamentals of bioinformatics	Cr	1, 6, 8, 9, 10, 18	11

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