Reg. No ..... Name **25P4007**

MSc DEGREE END SEMESTER EXAMINATION- MARCH 2025

SEMESTER 4 : BOTANY

COURSE : **21P4BOTT13 : GENETICS ENGINEERING**

(For Regular - 2023 Admission and Supplementary 2022/2021 Admissions)

Duration : Three Hours Max. Weights: 30

PART A

Answer any 8 questions **Weight: 1**

1.	Differentiate between Genomic and cDNA library.	(U, CO 4)
2.	What is IES?	(R, CO 1, CO 2, CO 5, CO 6)
3.	How are bacterial cells made competent for transformation.	(U, CO 1, CO 2, CO 3)
4.	Describe the role of acetosyringone in *Agrobacterium tumefaciens* infection.	(An, CO 1, CO 2, CO 3)
5.	Write the applications of GM plants.	(A, CO 4)
6.	Comment on the preparative step of plasmid DNA isolation.	(An)
7.	What are opines?	(U, CO 1, CO 2, CO 3, CO 5)
8.	Write the steps involved in genome editing.	(U, CO 2, CO 4)
9.	Write a short note on Meganucleases	(U, CO 4, CO 6)
10.	What is a selectable marker gene? Give example.	(U, CO 1, CO 2, CO 3)

(1 x 8 = 8)

PART B

Answer any 6 questions **Weights: 2**

11.	What are adaptors? Why they are synthesized with an unusual 5' terminus?	(E, CO 1, CO 2, CO 3, CO 5)
12.	Discuss the opine synthesis and tumour causing genes of Agrobacterium tumefaciens.	(Cr)
13.	Differentiate between Chromosome walking and Chromosome jumping.	(E, CO 6)
14.	Discuss the method of immunological screening for identifying clones from a library.	(U, CO 4)
15.	What is X-gal? Explain the role of the same in blue-white screening.	(An, CO 1, CO 2, CO 3)
16.	Explain about ZFN and TALEN.	(An, CO 4)
17.	Explain the applications of GM animals.	(A, CO 4)
18.	Evaluate the potential of antisense RNA technology as a tool for gene silencing.	(An, CO 1, CO 2, CO 3, CO 5, CO 6)

(2 x 6 = 12)

PART C

Answer any 2 questions **Weights: 5**

19.	Explain the procedure for the construction of a genomic library using phage λ system and write the significance of genomic DNA.	(A, CO 4)
20.	Explain the development of binary and cointegrate vector systems.	(R, CO 2, CO 3, CO 5, CO 6)
21.	Explain the isolation and purification of total cellular RNA.	(U, CO 1, CO 2, CO 3)
22.	Discuss the applications of genome editing.	(U, CO 4)

(5 x 2 = 10)

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.
CO 1	Define scope, significance and applications of recombinant DNA technology	U	2, 3, 4, 7, 10, 11, 15, 18, 21	16
CO 2	Explain the various tools and techniques in recombinant DNA technology	U	2, 3, 4, 7, 8, 10, 11, 15, 18, 20, 21	22
CO 3	Apply the novel findings of recombinant DNA technology in the field of agricultural, medicine or basic research.	A	3, 4, 7, 10, 11, 15, 18, 20, 21	20
CO 4	Examine the scope and relevance of genome editing as a stable method of genome manipulation	Cr	1, 5, 8, 9, 14, 16, 17, 19, 22	20
CO 5	Evaluate the potential applications of recombinant DNA technology in the field of agricultural, medicine or basic research.	E	2, 7, 11, 18, 20	11
CO 6	Formulate novel techniques or procedures for genome manipulation	Cr	2, 9, 13, 18, 20	11

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