Reg. No ..... Name **26P408**

M. Sc. DEGREE END SEMESTER EXAMINATION - MARCH 2026

SEMESTER 4 : BOTANY

COURSE : **24P4BOTT13 : GENETIC ENGINEERING AND BIOLOGICAL TECHNIQUES**

(For Regular 2024 Admission)

Time : Three Hours Max. Weights: 30

PART A

Answer any 8 questions **Weight: 1**

1.	Comment on the preparative step of plasmid DNA isolation.	(An, CO 1)
2.	Explain the applications of gene targeting.	(R, CO 2)
3.	Differentiate between the properties of gel used in PAGE and AGE.	(R, CO 5)
4.	What are the uses of expression vectors?	(U, CO 1)
5.	What is IPTG? Explain the role of IPTG in blue-white selection.	(U, CO 1)
6.	Diagrammatically explain the structure of Ti plasmid.	(Cr, CO 1, CO 2)
7.	What do you mean by disarmed Ti-plasmid?	(U, CO 1, CO 2)
8.	What is a selectable marker gene? Give example.	(U, CO 1)
9.	What are the limitations of TEM?	(U, CO 5)
10.	Write a short note on ZFN.	(A, CO 4)

(1 x 8 = 8)

PART B

Answer any 6 questions **Weights: 2**

11.	Explain the applications of GM animals.	(A)
12.	Comment on Cre recombinase - loxP system.	(An, CO 2)
13.	Comment on Meganucleases and CRISPR/Cas 9.	(U, CO 4)
14.	Write critical notes on PFGE and PAGE.	(U)
15.	Comment on different types of opines produced by *Agrobacterium*.	(An, CO 1, CO 2)
16.	Describe the important features and applications of YAC vector system.	(An, CO 1)
17.	What are the parts of a compound microscope? Explain each of its significance.	(An , CO 5)
18.	Explain the selection of transformed cells by Lac Z system.	(A, CO 1)

(2 x 6 = 12)

PART C

Answer any 2 questions **Weights: 5**

19.	What are immunoassays? Explain the working principle and applications of ELISA.	(U, CO 5)
20.	Explain any two methods of genome editing.	(E, CO 2, CO 4)
21.	How Ti plasmid can be used for genetic engineering in plants?	(U, CO 1, CO 2)

22. Explain the isolation and purification of mRNA from cells. (A, CO 1, CO 2)

(5 x 2 = 10)

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.
CO 1	Explain the fundamental and advanced aspects of recombinant DNA technology, gene cloning strategies	An	1, 4, 5, 6, 7, 8, 15, 16, 17, 20, 21	22
CO 2	Describe the various aspects of advanced transgenic technology	E	2, 6, 7, 12, 15, 19, 20, 21	22
CO 4	Describe the scope and relevance of genome editing & rDNA technology	An	10, 13, 19	8
CO 5	Develop an understanding of the many experimental methods that are frequently employed in research.	An	3, 9, 18	7

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