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M. Sc. Biotechnology, Semester-I Examination, 2023

Paper Title: Essentials of Genetic Engineering
Paper Code: MBT-CC102

Time: 2.5 h **Max Marks: 60**

Note: *This paper has 3 Sections, A, B, and C. Attempt all three sections. Section A: Answer all the questions; Section B: Answer any two; Section C: Answer all the questions, each question in this section has an internal choice*

Abbreviations Used:
CO- Course Outcome, PO- Program Outcome, BTL- Bloom Taxonomy Level: BT level 1- Remember; BT level 2-Understand; BT level 3-Apply; BT level 4-Analyse; BT level 5-Evaluate, BT level 6-Create

Section A (Attempt all questions) **(10 x 1 marks=10 Marks)**

Q. No	Questions	BTL	CLO	PLO
1.	Define different cloning strategies.	2	4	4
2.	What are the expression vectors?	3	3	3
3.	Write down the principle of Electromobility Shift Assay.	3	2	4
4.	Mention the role of adapters in molecular markers technique.	2	4	6
5.	What is Molecular Mapping?	1	1	5
6.	Explain RNAi, siRNA and miRNA.	2	1	3
7.	What is the role of PCR in the detection of minimum residual diseases?	3	2	8
8.	What are the various factors that affect the mobility of DNA in the gel?	3	3	4
9.	Name some factors which influence epigenetics.	2	1	3
10.	How RAPD is different from RFLP?	1	4	2

Section B: Long type Questions (Attempt any two out of four) **(2x15 marks=30 Marks)**

Q. No	Questions	BTL	CLO	PLO
11.	What are genomic and cDNA libraries and how can they be prepared? Discuss their utility in biotechnology programme.	3	4	3
12.	Write a note on various nucleic acid modifying enzymes.	4	3	2
13.	Describe in detail about the mechanism of gene transfer in bacteria.	5	2	4
14.	Give a brief overview about Mendel's key ideas about inheritance.	5	1	6

Section C: Short-type Questions (Attempt all questions, each question has an internal choice)

(4 x5 marks=20 Marks)

Q. No	Questions	BTL	CLO	PLO
15.	Write a note on DNase Foot Printing. **OR** How can we use PCR in molecular diagnostics? Explain	3	2	7
16.	Define the phenomenon of disarming the plasmid vectors. Where it is used? **OR** Explain Cosmids, YAC and BAC vectors.	2	3	5
17.	What is reverse genetics? Is RNAi forward or reverse genetics. Explain **OR** Where are cis-acting elements found and what are their functions.	2	1	6
18.	What are the steps involved in qRT-PCR, iPCR and AFLP, Explain with the help of flow chart? **OR** Write short notes on the following: (i) FISH (ii) Grunstein Hogness method	3	4	3

END OF THE QUESTION PAPER