647510 **23MSC3MicC301x** **Seat No :_____**

M.Sc. (Micro) Semester - 3 (*CBCS*) Examination
OCT/NOV-2025 (AS PER SYLLABUS YEAR JUNE-2024)
Genetic Engineering and Protein Engineering (Core (New-23))

Time: 2:30 Hours **Marks:70**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Que.1 Do as direct (any seven out of eight questions) (14)

1) Explain the function of reverse transcriptase.
2) Describe the application of restriction endonuclease in genetic engineering.
3) Express the function of cos in the vector.
4) Describe the unique characteristics of the YAC vector.
5) How phage display systems are used in protein engineering.
6) Define therapeutic proteins.
7) Describe the properties of the host for the insertion of DNA.
8) Explain the role of the marker gene in cloning.

Que.2 Answer the following (Any Two Questions) (14)

A) Explain the homopolymer tailing and PCR product as the joining methods.
B) Explain the host controlled restriction modification system.
C) Describe the enzyme used in genetic engineering.

Que.3 Answer the following (Any Two Questions) (14)

A) Explain pUC18 and pBR322.
B) Write a note on lambda phage.
C) Explain the BAC in detail.

Que.4 Answer the following (Any Two Questions) (14)

A) Explain the differential cloning and its advantages.
B) Explain the cDNA library construction with suitable figures.
C) Describe the introduction of foreign DNA into the plants and yeast cells.

Que.5 Answer the following (Any Two Questions) (14)

A) Write a note on phage display systems for protein engineering.
B) Explain DNA microarray techniques and their application.
C) Discuss the His-tag protein purification.

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