

M.Sc. (Micro) Semester - 3 (CBCS) Examination
OCT/NOV-2025 (AS PER SYLLABUS YEAR JUNE-2019)
Genetic Engineering and Protein Engineering (Core (New))

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

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

SECTION-I

- Que.1 Answer the following
- A) Write a note on the restriction modification system. (07)
 - B) Explain the types of restriction endonuclease and its application. (07)
- OR
- Que.1 Explain the DNA joining methods and describe its application in genetic engineering. (14)
- Que.2 Answer the following
- A) Write a short note on M13 vector. (07)
 - B) Explain the phagemid in detail. (07)
- OR
- Que.2 Explain the lambda vector and mention its molecular advantages. (14)
- Que.3 Do as direct (any seven) (07)
- 1) Define a chimeric vector in brief.
 - 2) Application of RNase enzyme.
 - 3) Draw a diagram of pUC18 vector.
 - 4) Define the function of IPTG in screening.
 - 5) Describe the term expression vector.
 - 6) Define the function of LacZ gene.
 - 7) What is EST? explain in brief.
 - 8) Explain the uses of reverse transcriptase.

SECTION-II

- Que.1 Explain the genomic cDNA library and its methods in detail. (14)
- OR
- Que.1 Answer the following
- A) Discuss nucleic acid hybridization. (07)
 - B) Explain nucleic acid blotting and hybridization (07)
- Que.2 Write a note on
- A) Describe the concept and techniques of site-directed mutagenesis. (07)
 - B) Explain cell-free display for protein engineering. (07)
- OR
- Que.2 Answer the following
- A) Write short on His tag protein purification. (07)
 - B) Write a note on DNA microarray and its application (07)
- Que.3 Do as direct (any seven) (07)
- 1) Explain LMO and GMO in brief.
 - 2) List various types of protein purification techniques.
 - 3) Define electroporation in GE.
 - 4) Describe the hybridization in brief.
 - 5) What is mutagenesis and explain its role?
 - 6) Give examples of protein microarrays?
 - 7) Write the application of therapeutic protein.
 - 8) Explain the role of *Agrobacterium tumefaciens* in GE.
