

**M.Sc. (Micro) Semester - 3 (CBCS) Examination****Nov/Dec-2023 (NEW COURSE)****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.

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**SECTION-I****Que-1 Answer the following**

- (A) Describe the role of ligase enzyme and explain the homopolymer tailing in ligation. (07)  
(B) Explain the functions and mechanism of DNA Polymerase, Reverse transcriptase and DNA ligase in molecular biology. (07)

OR

- Que-1** Explain host control restriction modification systems and types of restriction endonuclease with its variants. (14)

**Que-2 Answer the following**

- (A) Write a short note on Phagemid vector. (07)  
(B) Write a note on M13 and its mechanism. (07)

OR

- Que-2** Explain the lambda and YAC vector and mention its advantage and molecular mechanism. (14)

**Que-3 Do as direct (any seven)**

- (1) Define function Klenow fragment. (07)  
(2) What is polylinker? Explain in brief. (07)  
(3) Explain in brief topoisomerase. (07)  
(4) Explain reverse transcriptase in brief. (07)  
(5) Explain the uses of DNase and Proteinase K. (07)  
(6) Discuss the mode of action of PstI, HindIII and Ter<sup>R</sup>. (07)  
(7) Define the term insertion inactivation. (07)  
(8) What is the use of IPTG? and mention its function in molecular biology. (07)

**SECTION-II**

- Que-1** Explain the concept and principle of construction of genomic cDNA library and cDNA synthesis methods. (14)

OR

**Que-1 Answer the following**

- (A) How screening the gene of interest? Explain clones screening in detail. (07)  
(B) Describe the positional cloning in detail. (07)

**Que-2 Write a note on**

- (A) Explain the concept of site direct mutagenesis. (07)  
(B) Write note on stabilization of industrial enzyme. (07)

OR

**Que-2 Answer the following**

- (A) Write short on GST tag protein purification. (07)  
(B) Write a note on Phage display techniques used for protein engineering. (07)

**Que-3 Do as direct (any seven)**

- (1) Define RACE (07)  
(2) Enlist the protein purification techniques. (07)  
(3) Explain the uses of electroporation technique. (07)  
(4) Define hybridization. (07)  
(5) What is mutagenesis? explain in brief (07)  
(6) Define Inteins. (07)  
(7) What is the function of terminal transferase? (07)  
(8) Define DNA microarray. (07)

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