BBC-003-1194003 Seat No. _____

M. Sc. (Sem. IV) (CBCS) (WEF-2016) Examination

July - 2021

Microbiology : MICRO-421

(Biomolecular Engineering (Elective))

Faculty Code : 003

Subject Code : 1194003

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instruction : Answer any five questions.
Each question is of 14 marks.

1 Answer all seven: (2 marks each) **14**

(1) Define Domain in protein structure.
(2) Define molecular chaperone.
(3) Define protein engineering.
(4) Describe DNA-chip technology.
(5) What is oligonucleotide array detector?
(6) What is application of Inverse PCR?
(7) What is application of Multiplex PCR?

2 Answer all two : (7 marks each) **14**

(1) Write in detail molecular forces/bonds that stabilize protein structure.
(2) Describe various domain structures and their importance in catalysis.

3 Answer all two: (7 marks each) **14**

(1) Explain mechanistic detail of Hsp60 a molecular chaperone in protein folding.
(2) Write about various molecular chaperones active in extreme environmental condition.

4 Answer all two: (7 marks each) **14**

(1) Explain role of gene shuffling with respect to directed evolution.

(2) What is the method for screening of novel traits created by protein engineering?

5 Answer all two: (7 marks each) **14**

(1) Explain the principle of Sanger's sequencing.

(2) Explain next generation sequencing.

6 Answer all two: (7 marks each) **14**

(1) Strategies for primer designing.

(2) Describe the molecular tagging of expressed proteins.

7 Answer all two: (7 marks each) **14**

(1) Explain Pathway evolution as a part of protein engineering.

(2) Explain gene expression can be enhanced by change in codon usage bias.

8 Answer all two: (7 marks each) **14**

(1) Application of molecular chaperones in medical field as biotechnological significance.

(2) Explain role of Molecular chaperone in cellular proteostasis.

9 Answer all two: (7 marks each) **14**

(1) Explain the peptide geometry with an example.

(2) Explain functioning of molecular chaperone Hsp 100 in disaggregation of misfolded protein.

10 Answer all two: (7 marks each) **14**

(1) Explain Real time PCR method and principle.

(2) Explain gene expression can be enhanced by change in codon usage bias.
