

(3 Hours)

(Total Marks : 80)

- N.B.:** (1) **Question No.1** is compulsory.
(2) Attempt **any 3** questions out of remaining **5** questions.
(3) **Each** question is of **20** marks.
(4) **Figures** to the **right** indicates **full marks**.
(5) **Draw** diagram wherever **necessary**.

1. Explain **any four** in short with labelled diagram of the following : (20)
 - a) Primary protein structure
 - b) Hydrogen Bonds
 - c) Leucine zipper
 - d) Membrane proteins structure
 - e) Insulin
 - f) tyrosyl-tRNA synthetase

2. (a) Explain ESI-MS. (10)
(b) Explain X-Ray crystallography. (10)

3. (a) Explain bonds that stabilize a protein molecule. (10)
(b) Explain torsion angles and Ramachandran plot. (10)

4. (a) Explain the protein degradation pathways in protein. (10)
(b) Explain the role of chaperons in protein folding. (10)

5. (a) Explain DNA shuffling & error-prone PCR in protein design. (10)
(b) Explain the target molecules of protein engineering. (10)

6. (a) Explain the engineering of proteins to assist purification of expressed proteins. (10)
(b) Explain the engineering of humanised antibodies. (10)