

Roll No.

Total Pages : 03

LMDE/D-23

6033

PROTEINS AND PROTEOMICS

BCH-103

(wef 2023-24 LOCF)

Time : Three Hours]

[Maximum Marks : 80

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

(Compulsory Question)

1. Explain the following : **2×8=16**

- (i) Domain
- (ii) Partial double bond character of peptide bond
- (iii) Quarternary structure of proteins
- (iv) Molten globule
- (v) Function of SDS and beta mercaptoethanol in SDS-PAGE
- (vi) Specific activity
- (vii) Mention different types of proteomics
- (viii) Transmembrane domain.

Unit I

2. Explain the determination of N-terminal sequence, C-terminal sequence and location of disulphide bonds during sequencing of proteins **16**
3. Write notes on the following with reference to alpha helix of proteins : **16**
 - (i) Factors that cause a polypeptide to take alpha-helix
 - (ii) Forces that stabilise the alpha-helical structure
 - (iii) Factors that affect the alpha-helix stability
 - (iv) 3.10-helix, 3.613-helix and 4.416 helix.

Unit II

4. (a) What are molecular chaperones ? Discuss the proteins involved in folding of proteins.
(b) Explain the structure and function of cytochrome C. **8,8**
5. (a) How is change in proteins' conformation and misfolding related to development of diseases.
(b) Explain denaturation and renaturation of proteins taking suitable example. **8,8**

Unit III

6. (a) Discuss the use of ion exchange chromatography for protein purification.

- (b) What is fold purification and percent yield of protein purification ?

- (c) Write a short note on HPLC. **8,4,4**

7. (a) Explain the following with respect to purity analysis :
 - (i) Native-PAGE
 - (ii) Isoelectric focusing.
- (b) How are proteins separated using SDS-PAGE detected and quantified ? **5,5,6**

Unit IV

8. (a) Discuss the principle and one major application of mass spectroscopy.
(b) What is proteomics ? Also discuss two major techniques used in proteomics. What are the advantages of two-dimensional PAGE ? **8,8**
9. (a) Enumerate the applications of proteomics in medicine.
(b) How are protein-protein interactions identified ?
(c) How are protein spots detected ? **7,6,3**