

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**