Your Exam Roll No /Enrol no. _____

Examination: MSc Biochemistry, Semester II (2022)

Paper: MBC-202

(Proteins and Proteomics)

Time: 3 hours Maximum marks: 75

Instructions: Attempt all questions in proper sequence/chronological order. Each answer should start from a fresh page. Cite examples and draw suitable diagrams wherever necessary.

Question 1. Attempt all of the following questions.

(A) Complete the following statements with appropriate answers [1x7=7]

a. Pro residues .....the alpha helix form in a protein.
b. Heat shock proteins are also known as .....
c. Leucineaminopeptidase specifically performs ..... function.
d. Beta mercaptoethanol and .....perform similar functions.
e. SDS is a .....type of a detergent.
f. Folding of proteins leads to a .....in the entropy.
g. CD can accurately determine the .....type of structures in a protein

(B) Answer the following questions briefly. [2x4=8]

h. CNBr cleavage of a protein
i. Mechanism of action of Urea and Guanidinium hydrochloride when they are treated with a protein.
j. Differentiate between the Native PAGE and SDS PAGE.
k. Differentiate between salting in and salting out of proteins

Question 2. Answer the following questions.

a. Describe the salient features of the G N Ramachandran diagram. Discuss the significance of the plot for interpreting the protein structure. Elaborate the applications of the Ramachandran diagram. [15]

OR

a. Discuss any one method which you have studied to identify the N- terminal identification of a peptide. [7.5]

b. Name two enzymes and two chemicals used commonly for protein hydrolysis. Indicate their specificity also. [7.5]

Question 3. Answer the following questions.

a. Discuss the role of protein disulfide isomerase and peptidyl prolyl isomerase in protein folding. [5]

b. Explain the hydropathy plot in detail and discuss the significance of this plot. [10]

OR

a. What are molecular chaperones. Discuss the characteristic features and explain their mechanism of action citing one example. [15]

Question 4. Answer the following questions.

a. Describe the various types of super secondary structures found in proteins. Support your answer with suitable examples. [5]

b. Discuss the major types of forces responsible for the stability of secondary and tertiary structures of proteins [10]

OR

a. Compare and contrast the oxygen dissociation curves of Hemoglobin and Myoglobin [5]

b. Explain in detail the Edmans method of protein sequencing. Indicate the advantages and disadvantages if any of the method. [10]

Question 5. Answer the following questions.

a. Describe the principle, method and applications of Isoelectric Focusing [8]

b. Discuss the technique of Tandem MS. What are the applications of this technique in studying proteins. [7]

OR

a. What do you understand by the term proteomics. Discuss the basic principle and applications of MALDI-TOF MS. [8]

b. Describe the use of X-ray Crystallography for prediction of 3D protein structure determination. Discuss its major applications. [7]

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