Manuscript

# Avinashilingam Institute for Home Science and Higher Education for Women

(Deemed to be University under Category 'A' by MHRD, Estd. u/s 3 of UGC Act 1956)
Re-accredited with 'A++' Grade by NAAC. Recognised by UGC Under Section 12B
Coimbatore - 641 043, Tamil Nadu, India

**Continuous Internal Assessment Test - I August 2024**
**III Semester**

**Class: II UG** **Time: 2 Hours**
**Course: Biochemistry and Biotechnology** **Max. Marks: 60**

## 23BBCC03 Proteins and Enzymes

**Course Outcome:**

**CO1:** Describe the isolation and purification of protein by various methods and to estimate the amount of proteins
**CO2:** Classify the protein based on structure, solubility and function. Understand the methods of sequencing of aminoacids and proteins
**CO3:** Acquire theoretical knowledge on various methods of measurement of enzymatic reactions and understanding the enzyme kinetics and the mechanism of action of enzymes
**CO4:** Appreciate the role of enzyme in regulation of metabolism
**CO5:** Understanding the role of enzymes in clinical diagnosis and industries

### Part A — 6x1 = 6

**Choose the correct answer**

1. Which of the following proteins was first sequenced by Frederick Sanger? **CO1K2**
   a. Myosin b. Insulin c. Myoglobin d. Haemoglobin
2. Which of the following is responsible for specifying the 3D shape of a protein? **CO1K3**
   a. The peptide bond b. The amino acid sequence
   c. Interaction with other polypeptides d. Interaction with molecular chaperons
3. When you measure the amount of a protein in a solution by UV absorbance, you are detecting the UV absorbance of predominantly which amino acid? **CO1K3**
   a. Histidine b. Proline c. Tryptophan d. Tyrosine
4. Which of the following factors is not responsible for the denaturation of proteins? **CO2K2**
   a. Heat b. Charge c. pH change d. Organic solvents
5. The salting out process involves the precipitation of proteins **CO2K3**
   a. on the basis of acidity b. using sodium chloride
   c. using ammonium sulphate d. using copper sulphate
6. Final Year project student added ammonium sulphate to a tube containing a crude extract of protein, and then centrifuged the solution. What was the student probably trying to do? **CO2K4**
   a. Change the pH of the buffer solution to solubilise all the proteins
   b. Hydrolyse the proteins into their constituent amino acids to determine their amino acid compositions
   c. Selectively precipitate a particular protein
   d. Denature the protein of interest to reconstruct its structure

### Part B — 3 x 6 = 18

**Answer the following**
**Answers should not exceed 400 words or two page**

7. a. Discuss the extraction of protein by mechanical methods **CO1K2**
   (Or)
   b. What is salting in and salting out in dialysis? Illustrate **CO1K2**
8. a. Summarize the centrifugation technique for separating particles **CO1K3**
   (Or)
   b. Describe the Anfinsen's experiment with illustration **CO2K2**
9. a. Review the forces involved in protein conformation **CO2K2**
   (Or)
   b. Illustrate the tertiary structure of myoglobin **CO2K2**

### Part C — 3 x 12 = 36

**Answer the following not exceeding 800 words or four pages**

10. a. Elaborate the method for the Detection of the desired protein by gel electrophoresis **CO1K2**
    (Or)
    b. Size exclusion chromatography separates molecules based on their size by filtration through a gel -Justify. **CO1K4**
11. a. Achromatographic technique conducts the separation according to magnitude of netelectric charge of the proteins-Explain **CO1K3**
    (Or)
    b. Classification of proteins based on structure and function **CO2K3**
12. a. Elaborate the sequencing of protein by Edman's degradation method **CO2K2**
    (Or)
    b. Sketch the secondary structure of protein **CO2K2**

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