Avinashilingam Institute for Home Science and Higher Education for Women
(Deemed to be University Estd. u/s 3 of UGC Act 1956, Category 'A' by MHRD [now MoE]
Re-accredited with an 'A++' Grade by NAAC CGPA 3.65/4, Category I by UGC
Coimbatore – 641 043, Tamil Nadu, India

Continuous Internal Assessment Test I – August 2025
III Semester

Class : II UG **Time: 2 hours**
Major: Biochemistry and Biotechnology **Max.marks: 60**

23BBCC03 Proteins and Enzymes

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 aminoacid 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
Choose the Correct the Answer **6 x 1 = 6**

1. Which of the following best describes *salting out* in protein purification? CO1K2
   a. Protein solubility increases with the addition of salt
   b. Protein denaturation due to high temperature
   c. Protein solubility decreases with the addition of high salt concentration
   d. Protein is precipitated by changing pH to isoelectric point

2. Name the technique used to separate proteins based on their molecular size during purification. CO1K2
   a. Gel filtration chromatography b. Ion-exchange chromatography
   c. Affinity chromatography d. Gas chromatography

3. Which of the following compound is not involved in Edman degradation?
   a. Phenylisothiocyanate b. CF_3 COOH c. FDNB d. Phenylthiocarbonyl

4. Glucokinase catalyses the phosphorylation of D-glucose in the presence of ATP and it would be classified as one of the CO3K3
   a. Oxidoreductases b. transferases
   c. hydrolases d. isomerases

5. If the K_M of an enzyme for its substrate remains constant as the concentration of the inhibitor increases, what can be said about mode of inhibition. CO3K4
   a. competitive b. uncompetitive
   c. non competitive d. irreversible

6. Find the initial velocity for an enzymatic reaction when Vmax = 6.5 x 10-5 mol.sec-1, [S] = 3.0 × 10-3 M, KM = 4.5 x 10-3 M
   a. 2.6 X10-5 moles /sec b. 2.6 X10-5 micromoles /sec
   c. 2.6 X10-12 moles /sec d. 2.6 X10-12 micromoles /sec

Part B **3 x 6 = 18**
Answer the following
Answers should not exceed 400 words or two pages

7.a. Discuss the methods used for extraction and precipitation of proteins. CO1K1
(or)
7.b. Highlight the techniques employed for protein quantification involving copper ion. CO1K1

8.a. Classify proteins based on their solubility and explain each class with suitable examples CO2K2
(or)
8.b. Explain the factors affecting the enzyme activity CO3K3

9.a. Give a brief account of the classification of enzymes by the IUB system. CO3K2

(or)

9. b. Describe allosteric enzymes with suitable examples. CO4K2

Part- C **3 x12 = 36**

Answer ALL questions

Each answer should not exceed 800 words or four pages

10.a. Size exclusion chromatography separates molecules based on their size by filtration through a gel -Justify CO1K4

(Or)

10.b. A chromatographic technique conducts the separation according to the magnitude of the netelectric charge of the proteins. Explain. CO1K4

11.a. Explain the methods of determining N-terminal and C-terminalamino acids. CO2K3

(Or)

11.b. Explain the different linear transformations used to represent the Michaelis-Menten equation.

12.a. Derive the Michaelis-Menten equation for enzyme kinetics in detail. CO3K2

(Or)

12.b. Explain the different types of enzyme inhibition with suitable examples CO3K2

Staff in-charge:

Aided Programme : Dr. M. Rajeswari

SF Programme :Dr.K.V.Shalini

Total Number of QP: 60 (aided)+40 (SF)