

(PART-B : Descriptive)

Time : 2 hrs. 40 min.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

1. Define holoenzyme, apoenzyme, and prosthetic group. Give the classification of enzymes with suitable examples. 3+7=10
2. Explain in brief how enzyme catalyzes a reaction? Explain the mechanism of enzyme catalysis. 4+6=10
3. Write how vitamin B1, vitamin B2, niacin, vitamin B6 and pantothenic acid act as co-enzyme. 10
4. Define active site and multi-enzyme complex. Give the salient features of active site. Add a note on co-enzymes 2+4+4=10
5. Derive Michaelis Menten equation. 10
6. Write a short note on competitive, non-competitive and mixed inhibition. 10
7. Mention the use of enzymes in industry and briefly. Explain some of them. 10
8. What is immobilization of enzymes? Explain some technique to immobilize enzymes. 3+7 =10

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**B.Sc. BIOTECHNOLOGY
SIXTH SEMESTER
ENZYMOLGY
BBT-602**

(Use separate answer scripts for Objective & Descriptive)

Duration : 3 hrs.

Full Marks : 70

(PART-A : Objective)

Time : 20 min.

Marks : 20

Choose the correct answer from the following:**1X20=20**

1. Which one of the following is produced when an apoenzyme binds with a hollow enzyme?
 - a. Enzyme substrate complex
 - b. Prosthetic group
 - c. Holoenzyme
 - d. None of the above
2. Digestive enzymes belong to the class
 - a. Lyases
 - b. Ligases
 - c. Hydrolases
 - d. All of the above
3. The first enzyme that was isolated and crystallized was
 - a. Nuclease
 - b. Urease
 - c. Lipase
 - d. Pepsin
4. Group transfer reactions are catalyzed by which class of enzyme?
 - a. Isomerase
 - b. Ligase
 - c. Lyase
 - d. None of the above
5. Biotin is the active co-enzyme of which vitamin?
 - a. Cobalamin
 - b. Thiamine
 - c. Biotin
 - d. Riboflavin
6. Which of the following molecules cannot be classified as an enzymatic cofactor?
 - a. valine
 - b. PLP
 - c. Mg⁺
 - d. FAD
7. Which is the most frequently found amino acid in the active site of an enzyme?
 - a. Lysine
 - b. Methionine
 - c. Serine
 - d. Aspartic acid
8. What are the active co-enzymes of the vitamin riboflavin?
 - a. FMN/FAD
 - b. FMN/NAD
 - c. NAD/NADP
 - d. All of the above
9. Which of the following statements is false with respect to an enzyme's ability to catalyze a reaction?
 - a. An enzyme provides a reaction surface and a suitable environment for the reaction to take place
 - b. An enzyme binds reactants such that they are positioned correctly and can attain their transition-state configurations

- c. An enzyme can weaken bonds in reactants through the binding process
- d. An enzyme allows the reaction to go through a less stable transition state than would normally be the case
10. Enzymes catalyze biochemical reactions by altering which of the following quantities associated with the reaction?
- a. The change in Gibbs' free energy
- b. The activation energy
- c. The enthalpy of formation
- d. The equilibrium constant
11. Which of the following terms best describes a drug that bind to an active site and inhibits an enzyme, and where inhibition decreases when substrate concentration is increased?
- a. Allosteric inhibitor
- b. Irreversible inhibitor
- c. Reversible inhibitor
- d. Suicide substrate
12. Which of the following is true about Michaelis-Menten kinetics?
- a. K_m , the Michaelis constant, is defined as that concentration of substrate at which enzyme is working at maximum velocity
- b. It describes substrate concentration that gives half maximum velocity
- c. K_m , the Michaelis constant is defined as the dissociation constant of the enzyme-substrate complex
- d. It assumes covalent binding occurs between enzyme and substrate
13. The rate determining step of Michaelis-Menten kinetics is
- a. The dissociation of ES complex.
- b. The complex formation step.
- c. The product formation step.
- d. None of the above.
14. The immobilized enzyme produced by micro encapsulation technique provides
- a. An extremely large surface area.
- b. Smaller surface area.
- c. High amount of solvent.
- d. Relatively smaller surface area.
15. Most industrial enzymes are isolated from
- a. Plant
- b. Microbes
- c. Animal tissues
- d. All of the bove
16. Alcohol dehydrogenase enzyme is an example of which class of enzyme?
- a. Oxidoreductase
- b. Transferase
- c. Isomerase
- d. Ligase
17. Enzymes are
- a. Proteins
- b. Thermolabile
- c. Increases the rate of the reaction
- d. All of the above
18. All enzymes are proteins except
- a. Apoenzyme
- b. Multi-enzyme complex
- c. Both (a) and (b)
- d. Riboenzyme
19. β -amylase is
- a. Endoenzyme
- b. Exoenzyme
- c. Saccharifying enzyme
- d. both (b) and (c)

20. Liquefaction of starch to dextrin is carried out by
- a. Cellulase
- b. Pectinase
- c. α -amylase
- d. All of these