Choose the best answer from the given alternatives

1.Whatis the primary role of enzymes in a chemical reaction?

A. To increase the activation energy

B. To act as a reactant

C. To accelerate reaction rates by lowering activation energy

D. To permanently bind to the product

2. enzymes are primarily composed of which macromolecule?

A. Carbohydrates

B. Proteins

C. Nucleic acids

D. Lipids

3. What are the enzymes that require a non-protein cofactor called?

A. Apoenzymes

B. Holoenzymes

C. Proenzymes

D. Isoenzymes

4. Which structural level of proteins involves the folding of the polypeptide chain into an α-helix or β-sheet?

A. Primary structure

B. Tertiary structure

C. Quaternary structure

D. Secondary structure

5. Which class of enzymes catalyzes the joining of two molecules?

A. Ligases

B. Hydrolases

C. Oxidoreductases

D. Isomerases

6. [n the "Lock and Key" model, what does the active site represent?

A. A flexible region that changes shape

B. A rigid area perfectly complementary to the substrate

C. A site for allosteric regulation

D. The region where cofactors are permanently stored

7. How does the "Induced Fit" model differ from the "Lock and Key" model?

A. The enzyme is rigid and unchanging

B. Substrates change shape to fit the enzyme

C. The active site molds to the substrate upon binding

D. The enzyme does not catalyze the reaction

8. What is an allosteric enzyme?

A. An enzyme that works only at high temperatures

B. An enzyme with a single active site and no regulation

C. An enzyme regulated by effectors at a site other than the active site

D. An enzyme that does not require a protein structure

9. What happens to an enzyme during the process of denaturation?

A. It becomes more efficient

B. It loses its specific three-dimensional structure and function

C. It converts into a different class of enzyme

D. It gains an extra active site

10. which statement best describes the turnover number?

A. The number of substrates converted per second at saturation

B. The total mass of the enzyme

C. The amount of energy required to inhibit the enzyme

D. The time it takes for an enzyme to synthesize

11. If you add more substrate to an enzyme-catalyzed reaction that has reached V max

, what happens to the rate?

A. It increases rapidly

B. It decreases immediately

C. It remains constant because the enzyme is saturated

D. It stops completely

12. A molecule binds to the active site, preventing the substrate from entering. What type of inhibitor is this?

A. Noncompetitive inhibitor

B. Competitive inhibitor

C. Uncompetitive inhibitor

D. Allosteric activator

13. In malting, what is the primary purpose of kilning (heating)?

A. To increase enzyme activity significantly

B. To stop the germination process by drying

C. To turn the grain into protein

D. To change the enzyme into a coenzyme

14. Which type of inhibition involves the inhibitor binding only to the enzyme-substrate complex?

A. Uncompetitive inhibition

B. Competitive inhibition

C. Noncompetitive inhibition

D. Irreversible inhibition

15. Why is the quaternary structure of proteins significant for some enzymes?

A. It provides the only binding site for substrates

B. It allows for the association of multiple folded subunits

C. It prevents the enzyme from denaturing

D. It serves as the primary source of amino acids

16. Compare and contrast the active site and allosteric site. Which is true?

A. Both bind the substrate with equal affinity

B. The active site binds substrates; the allosteric site binds effectors

C. Both sites perform the same catalytic function

D. The active site is always occupied by an inhibitor

17. What does a Michaelis-Menten plot (rate vs. substrate concentration) demonstrate?

A. A linear increase indefinitely

B. The saturation kinetics of an enzyme

C. The relationship between enzyme weight and activity

D. The permanent bonding of the enzyme to the product

18. Which of the following differentiates an irreversible inhibitor from a reversible one?

A. Irreversible inhibitors bind via hydrogen bonds

B. Irreversible inhibitors permanently block the enzyme's action

C. Irreversible inhibitors are easily washed away

D. Irreversible inhibitors only bind to the allosteric site

19. why is "feedback inhibition" an efficient regulatory mechanism in metabolic pathways?

A. It ensures the cell produces excess product

B. It saves resources by stopping production when the product is abundant

C. It permanently destroys the enzyme to prevent waste

D. It increases the reaction rate regardless of concentration

20. A researcher observes an enzyme is a marker for myocardial infarction. What does this mean?

A. The enzyme causes the infarction

B. The enzyme level indicates a specific disease state

C. The enzyme is non-functional in all humans

D. The enzyme is a type of inhibitor

21.Which industrial application is most improved by genetic modification of enzymes?

A. Making the enzyme slower

B. Improving specific properties and functionality

C. Removing the need for a protein structure

D. Eliminating the use of cofactors entirely

22. What are the three steps of modern malting?

A. Steeping, Germinating, Kilning

B. Mixing, Heating, Cooling

C. Boiling, Freezing, Drying

D. Grinding, Sieving, Heating

23. What is the function of the "prosthetic group" in a conjugated protein?

A. To provide the peptide backbone

B. It is a firmly attached non-protein part (cofactor)

C. To act as a competitive inhibitor

D. To change the enzyme's primary structure

24. If a reaction’s activation energy is lowered, what is the observable effect?

A. The reaction stops

B. The reaction happens faster

C. The reaction releases less energy

D. The enzyme becomes denatured

25. When comparing enzyme models, why is "Induced Fit" generally considered more accurate than "Lock and Key"?

A. Because it accounts for the conformational flexibility of enzymes

B. Because it denies the existence of an active site

C. Because it proves enzymes are non-protein

D. Because it eliminates the need for substrate

26. Which of the following is NOT a class of enzymes?

A. Ligases

B. Hydrolases

C. Oxidoreductases

D. Proteases

27. What is the result of increasing the concentration of a competitive inhibitor?

A. The V

max

of the enzyme changes

B. The substrate must compete with more inhibitor molecules

C. The enzyme structure permanently breaks down

D. The reaction rate immediately accelerates

28. If an enzyme functions in the stomach (pH ~2), what happens to its activity in the intestine (pH ~8)?

A. It remains the same

B. It likely decreases or stops due to non-optimal pH

C. It becomes a different enzyme

D. It increases indefinitely

29. luring genetic modification, what is the outcome of the process on the enzyme?

A. It gains new active sites but loses function

B. It is used to improve properties and create desired active forms

C. It turns into a carbohydrate

D. It removes the amino acid sequence entirely

30. Why do cells have thousands of enzymes?

A. To fill the cytoplasm with proteins

B. To facilitate specific chemical reactions necessary for survival

C. To increase the temperature of the cell

D. To prevent the cell from dividing