Multiple Choice Questions

1. What is the primary function of enzymes in living organisms?
   - A) To store genetic information
   - B) To provide structural support
   - C) To catalyze biochemical reactions
   - D) To synthesize proteins
2. Which of the following is a characteristic of enzymes?
   - A) They are consumed during reactions
   - B) They alter the equilibrium of reactions
   - C) They lower the activation energy of reactions
   - D) They are not specific to substrates
3. What type of molecule are most enzymes?
   - A) Carbohydrates
   - B) Lipids
   - C) Proteins
   - D) Nucleic acids
4. Which enzyme is involved in the digestion of proteins in the stomach?
   - A) Amylase
   - B) Lipase
   - C) Pepsin
   - D) Trypsin
5. What is the role of coenzymes in enzyme action?
   - A) To increase the size of the enzyme
   - B) To decrease the activity of the enzyme
   - C) To assist the enzyme in catalyzing reactions
   - D) To change the substrate
6. Which of the following is an example of a competitive inhibitor?
   - A) Malonate for succinic dehydrogenase
   - B) Succinate for succinic dehydrogenase
   - C) Oxidoreductase
   - D) Hydrolase
7. What is the term for the inactive form of an enzyme that requires activation?
   - A) Modulator
   - B) Vitamin
   - C) Zymogen or proenzyme
   - D) Hormone
8. Which enzyme complex is involved in alcoholic fermentation?
   - A) Invertase
   - B) Lipase
   - C) Amylase
   - D) Zymase
9. How do enzymes increase the rate of reactions?
   - A) By increasing the temperature
   - B) By adding more reactants

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- C) By lowering the activation energy
- D) By changing the pH

10. Which of the following statements about enzymes is incorrect?
    - A) Enzymes are specific to their substrates
    - B) Enzymes are proteins
    - C) Enzymes lower the activation energy of reactions
    - D) Enzymes are consumed during reactions
11. What is the term for the active part of an enzyme where the substrate binds?
    - A) Active site
    - B) Inactive site
    - C) Binding site
    - D) A is correct, but B and C are not specific terms for the active part
12. Which of the following enzymes was first isolated and purified in crystalline form?
    - A) Pepsin
    - B) Amylase
    - C) Urease
    - D) Ribonuclease
13. What is the role of apoenzymes?
    - A) They are the active form of enzymes
    - B) They are the protein part of enzymes without cofactors
    - C) They are involved in DNA replication
    - D) They are types of coenzymes
14. Which of the following is not a characteristic of enzymes?
    - A) Specific in nature
    - B) Protein in chemistry
    - C) Increase the rate of reaction
    - D) Consumed in reaction
15. How do non-competitive inhibitors affect enzyme activity?
    - A) They bind to the active site
    - B) They bind to a site distinct from the active site
    - C) They increase the activation energy
    - D) They decrease the substrate concentration
16. Which model proposed that enzymes change shape to fit substrates?
    - A) Lock and key model
    - B) Induced fit model
    - C) Competitive inhibition model
    - D) Non-competitive inhibition model
17. What is the term for enzymes that catalyze the formation of phosphodiester bonds in DNA?
    - A) Ligase
    - B) Helicase
    - C) Polymerase
    - D) Ligase is correct, but it is not exclusive to DNA
18. Which of the following is an example of an enzyme that aids in DNA repair?
    - A) DNA polymerase

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- B) DNA helicase
- C) DNA ligase
- D) All of the above are involved in DNA processes

19. How do enzymes maintain their activity?
    - A) By changing their shape frequently
    - B) By binding to substrates permanently
    - C) By maintaining their three-dimensional structure
    - D) By increasing their size
20. Which of the following statements about enzyme naming is true?
    - A) Enzymes are named based on their substrates and reactions they catalyze
    - B) Enzymes are named based on their functions only
    - C) A is correct, but B is partially correct
    - D) Enzymes are named randomly

True/False Questions

1. **True or False**: Enzymes are consumed during biochemical reactions.
    - **Suggestion**: Enzymes are not consumed during reactions.
2. **True or False**: All enzymes are proteins.
    - **Suggestion**: Most enzymes are proteins, but some are RNA molecules.
3. **True or False**: Enzymes alter the equilibrium of chemical reactions.
    - **Suggestion**: Enzymes do not change the equilibrium of reactions.
4. **True or False**: Coenzymes are required for the activity of all enzymes.
    - **Suggestion**: Not all enzymes require coenzymes.
5. **True or False**: Competitive inhibitors bind to the active site of an enzyme.
    - **Suggestion**: Competitive inhibitors compete with substrates for the active site.
6. **True or False**: Non-competitive inhibitors decrease the maximum velocity of an enzyme-catalyzed reaction.
    - **Suggestion**: Non-competitive inhibitors bind to a site other than the active site.
7. **True or False**: Enzymes increase the rate of reactions by increasing the temperature.
    - **Suggestion**: Enzymes lower the activation energy to increase the rate of reactions.
8. **True or False**: Zymase is an enzyme involved in protein digestion.
    - **Suggestion**: Zymase is involved in alcoholic fermentation.
9. **True or False**: Apoenzymes are the active forms of enzymes.
    - **Suggestion**: Apoenzymes are the protein part of enzymes without cofactors.

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10. **True or False**: Enzymes are specific to their substrates.

    - **Suggestion**: Enzymes are highly specific to their substrates.

11. **True or False**: The induced fit model describes how enzymes change shape to fit substrates.

    - **Suggestion**: The induced fit model explains how enzymes adjust their shape to bind substrates.

12. **True or False**: DNA ligase is exclusively involved in DNA repair.

    - **Suggestion**: DNA ligase is involved in DNA replication and repair.

13. **True or False**: Enzymes maintain their activity by frequently changing their shape.

    - **Suggestion**: Enzymes maintain activity by maintaining their three-dimensional structure.

14. **True or False**: Enzymes are named based solely on their functions.

    - **Suggestion**: Enzymes are often named based on their substrates and the reactions they catalyze.

15. **True or False**: Enzymes can be denatured by extreme temperatures.

    - **Suggestion**: Extreme temperatures can denature enzymes.

Short Answer Questions

1. **Explain how enzymes lower the activation energy of biochemical reactions.**

Answer: Enzymes lower the activation energy by providing an alternative reaction pathway with a lower energy barrier, allowing reactions to proceed faster without being consumed in the process.

2. **Describe the role of coenzymes in enzyme action.**

Answer: Coenzymes assist enzymes by transferring chemical groups or electrons during catalysis, enabling the enzyme to perform its function.

3. **What is the difference between competitive and non-competitive inhibition?**

Answer: Competitive inhibitors bind to the active site of the enzyme, competing with the substrate, while non-competitive inhibitors bind to another site, altering the enzyme's shape and affecting its activity.

4. **Explain the induced fit model of enzyme-substrate interaction.**

Answer: The induced fit model suggests that the enzyme's active site changes shape to fit the substrate, allowing for efficient binding and catalysis.

5. **What is the function of zymase in yeast?**

Answer: Zymase is a complex of enzymes that catalyzes the conversion of sugars into ethanol and carbon dioxide during fermentation.

Fill-in-the-Blank Questions

1. Enzymes are biological _ that accelerate biochemical reactions.

Answer:

2. Most enzymes are composed of _.

Answer:

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3. The _ site is where the substrate binds to the enzyme.

Answer:

4. _ inhibitors bind to a site other than the active site of the enzyme.

Answer:

5. Enzymes lower the _ energy of reactions to increase their rate.

Answer:

6. _ is an enzyme complex involved in alcoholic fermentation.

Answer:

7. The _ model describes how enzymes change shape to fit substrates.

Answer:

8. _ are inactive forms of enzymes that require activation.

Answer:

9. Enzymes maintain their activity by maintaining their _ structure.

Answer:

10. _ ligase is involved in forming phosphodiester bonds in DNA.

Answer:

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