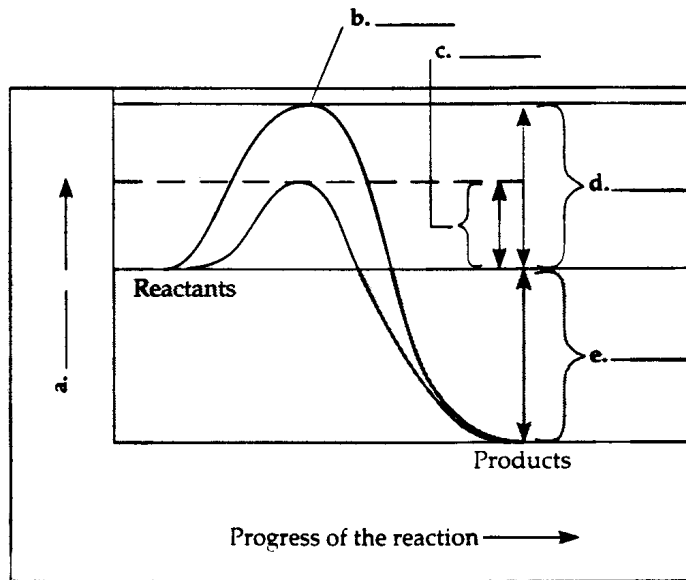


Enzymes

1. What are the key properties of enzymes and what is their function in biological systems?

CHARACTERISTICS	FUNCTIONS

Use the graph below to answer questions 2 – 7.



2. What is happening at letter b?

3. What is the relationship between the energy of the reactants and the energy of the products?

4. Define activation energy.

5. Which letter represents the activation energy for the reaction

a. Without the enzyme? _____

b. With the enzyme? _____

6. What does letter e represent?

7. What is the role of enzymes in biological systems?

8. What is the relationship between enzyme structure and enzyme specificity?

9. Define or describe each of the following:

Active Site	
Substrate	

10. Explain what happens in the induced-fit model of enzyme action.

11. List 4 ways enzymes can lower activation energy.

12. How does substrate concentration affect the rate of an enzyme-controlled reaction?

13. What happens to the rate of an enzyme-controlled reaction when the substrate level is high and remains high?

Why does this happen?

14. What environmental conditions affect enzyme activity?

Use the graph at the right to answer questions 15 – 17.

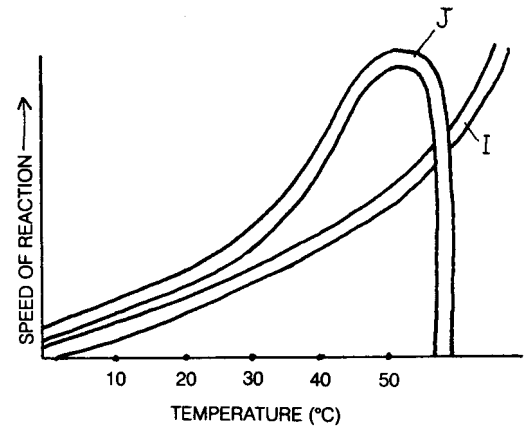
15. Why did the reaction rate for enzyme J drop when the temperature exceeded 50°C?

16. What is the optimal temperature for enzyme J?

How do you know this is the optimal temperature?

17. Could enzyme J be an enzyme found in the human body?

Why or why not?



Use the graph at the right to answer questions 18 – 20.

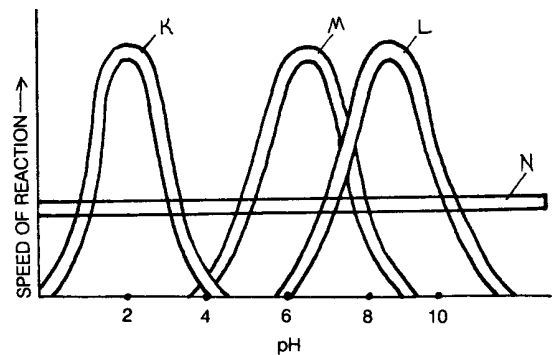
18. What is the optimal pH for:

Enzyme K? _____

Enzyme M? _____

Enzyme L? _____

19. Which letter represents the activity of an enzyme that could be found in the stomach?



20. What happens to enzyme activity when the pH is higher or lower than the optimal pH?

Why does this happen?

21. Match the definition/description with the correct term.

A. Allosteric enzymes

D. Competitive inhibitors

B. Coenzyme

E. Inhibitor

C. Cofactor

F. Noncompetitive inhibitors

_____ Small, nonprotein molecules needed for enzyme reactions

_____ Organic cofactors; vitamins

_____ Chemicals that inhibit enzyme activity

_____ Enzyme inhibitors that resemble the substrate and compete with the substrate for the active site

_____ Enzyme inhibitors that bind to the enzyme at a site other than the active site and cause the enzyme to change shape

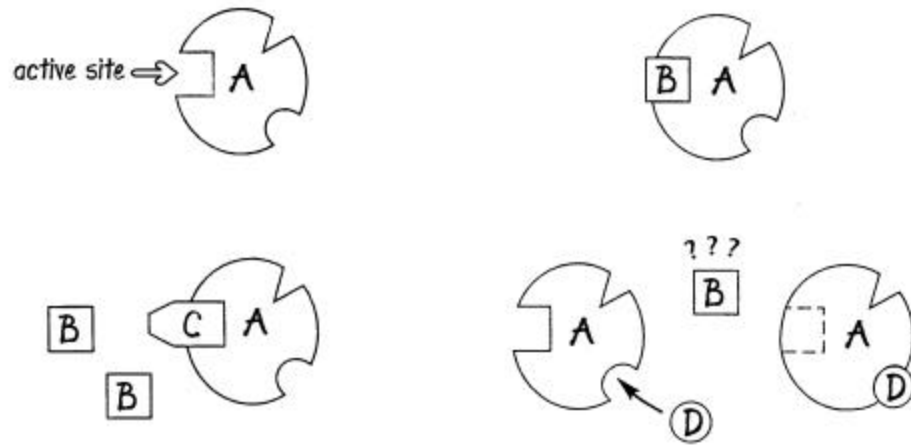
_____ Enzymes with two conformations – one active and one inactive

22. What is the role of each of the following in allosteric enzyme action?

a. Inhibitor: _____

b. Activator: _____

Use the drawings below to answer questions 23 – 25.



23. Which letter represents the enzyme? _____

24. If letter B represents the substrate, what kind of inhibitor (competitive or noncompetitive) does letter C represent?

How do you know? _____

25. What kind of inhibitor (competitive or noncompetitive) does letter D represent?

How do you know? _____

26. Describe what happens in feedback inhibition.

27. Describe what happens during cooperativity.
