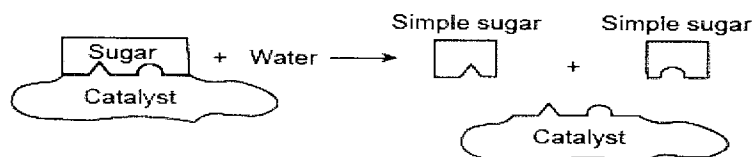


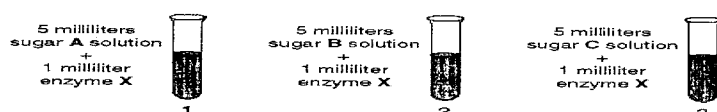
1. The diagram below illustrates a biochemical process that occurs in organisms.



The substance labeled “catalyst” is also known as

- (1) a hormone (3) an antibody
(2) an enzyme (4) an inorganic compound

An investigation was performed to determine the effects of enzyme *X* on three different disaccharides (double sugars) at 37°C. Three test tubes were set up as shown in the diagram below.



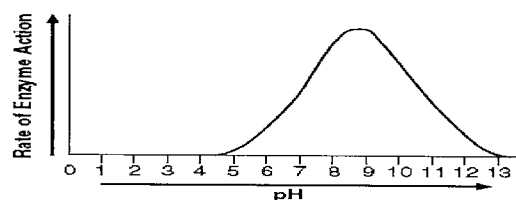
At the end of 5 minutes, the solution in each test tube was tested for the presence of disaccharides (double sugars) and monosaccharides (simple sugars). The results of these tests are shown in the table below.

	Test Tube 1	Test Tube 2	Test Tube 3
Monosaccharide	not present	not present	present
Disaccharide	present	present	not present

2. What can be concluded about the activity of enzyme *X* from the data table?

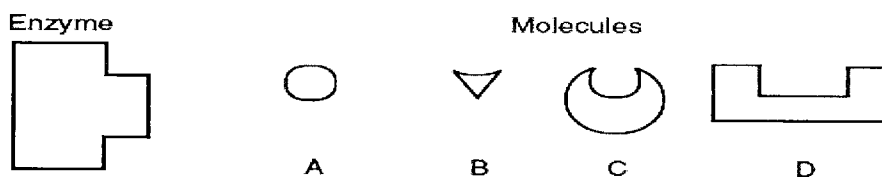
3. A characteristic of hormones and enzymes that allows them to work effectively with other organic molecules is their (1) specific shape (2) small size
(3) concentration of carbon and hydrogen atoms (4) high-energy bonds

4. The effect of pH on a certain enzyme is shown in the graph below.



- At what pH would the enzyme be most effective? (1) above 10
(2) between 5 and 7 (3) between 8 and 10 (4) below 5

Base your answers to questions 5 through 7 on the diagram below that represents a human enzyme and four types of molecules present in a solution in a flask.



5. Which molecule would most likely react with the enzyme? _____

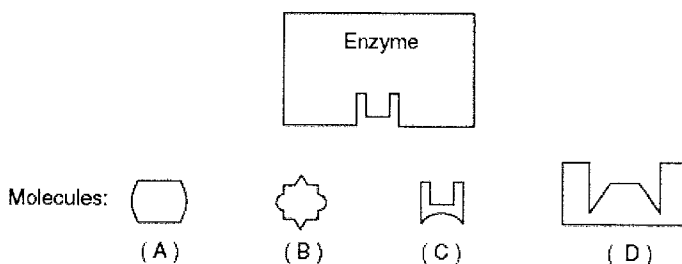
6. Explain your answer to question 5. _____

7. State what would most likely happen to the rate of reaction if the temperature of the solution in the flask were increased gradually from 10°C to 30°C.

8. A colony of bacteria growing on a culture medium is successfully synthesizing an organic compound. Which procedure would be *least* likely to have an effect on this synthesis?

- (1) adding more subunits of the organic compound to the medium
- (2) lowering the pH of the medium
- (3) raising the temperature of the colony from 20°C to 30°C
- (4) increasing the number of hormone molecules in the colony

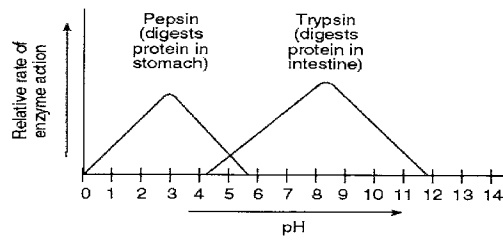
9. An enzyme and four different molecules are shown in the diagram below.



The enzyme would most likely affect reactions involving

- (1) molecule A, only
- (2) molecule C, only
- (3) molecules B and D
- (4) molecules A and C

Use the diagram on the next page and your knowledge of biology to assist you in answering questions 10 and 11 which follow.

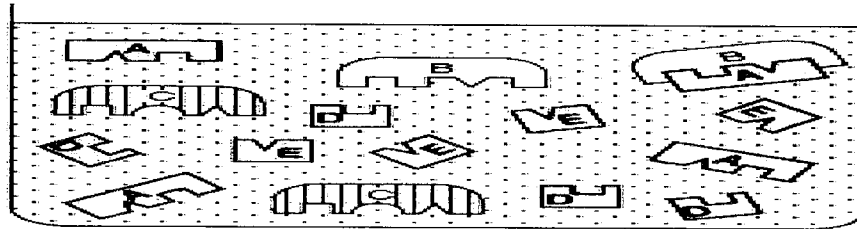


10. Pepsin works best in which type of environment?

- (1) acidic, only (2) basic, only
(3) neutral (4) sometimes acidic, sometimes basic

11. Neither enzyme works at a pH of (1) 1 (2) 5 (3) 3 (4) 13

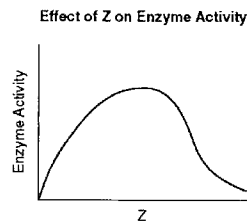
The diagram below represents a beaker containing a solution of various molecules involved in digestion.



12. Which structures represent products of digestion?

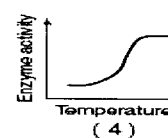
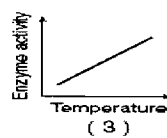
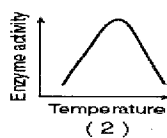
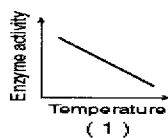
- (1) A and D (2) B and E (3) B and C (4) D and E

13. An incomplete graph is shown below.



What label could appropriately be used to replace letter Z on the axis?

14. Enzymes have an optimum temperature at which they work best. Temperatures above and below this optimum will decrease enzyme activity. Which graph best illustrates the effect of temperature on enzyme activity?



15-17. Enzyme molecules are affected by changes in conditions within organisms. Explain how a prolonged, excessively high body temperature during an illness could be fatal to humans. Your answer must include:

- the role of enzymes in a human
- the effect of this high body temperature on enzyme activity
- the reason this high body temperature can result in death

18. Define the term **denatured**.

19. Define the term **active site**.

20. Define the term **substrate**.

21-24. Correctly complete the following chart.

Organic Compound Class	Subunit or Building Block of Compound	Function(s) or Example(s) of the Compound
		Antibodies, enzymes, some hormones ... the function of the compound is controlled by its shape
	Fatty acids and glycerol	Energy storage, cushioning, and insulation
Carbohydrates		Includes starches and sugars which are used as energy sources and cellulose which makes up cell walls in plants
	Nucleotides	Has the genetic code in the nucleus and is involved in protein synthesis at the ribosomes; DNA and RNA are examples