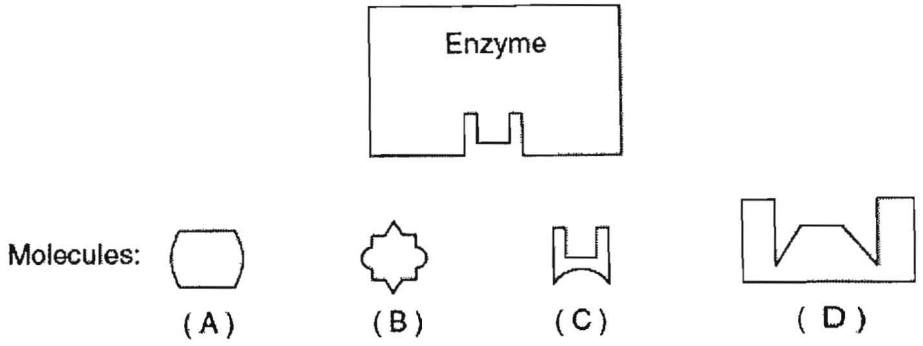
Name _____ Period _____

Regents Biology Date _____

ENZYME REVIEW

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



The enzyme would most likely affect reactions involving

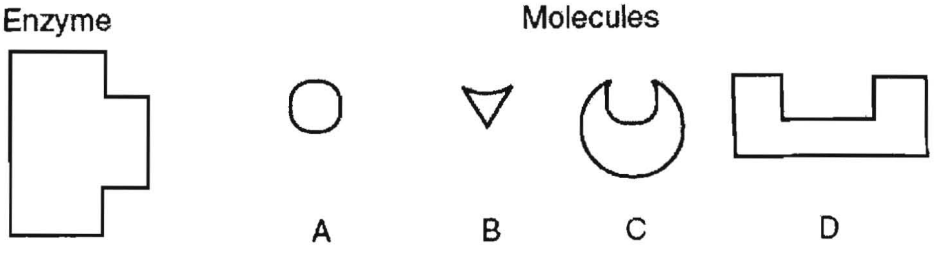
(1) molecule *A*, only

(2) molecule *C*, only

(3) molecules *B* and *D*

(4) molecules *A* and *C*

2. Base your answers to questions 2 through 4 on the diagram below that represents a human enzyme and four types of molecules present in a solution in a flask.



Which molecule would most likely react with the enzyme? D

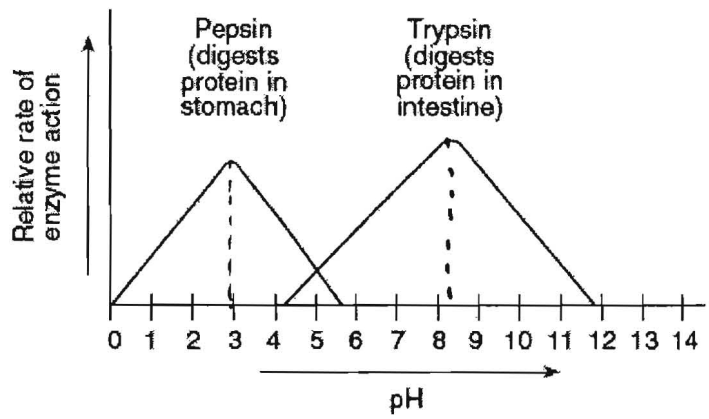
3. Explain your answer to question 2. What principle about how enzymes work does the question illustrate?

Lock & Key the enzyme's active site has a shape that matches substrate D.

4. Match the enzymes with their substrates and functions.

3	A. amylase	1.	synthesizes DNA
6	B. protease	2.	digests sugar in beer (maltose)
5	C. lactase	3.	digests starch (amylose)
1	D. DNA polymerase	4.	synthesizes ATP
2	E. maltase	5.	digests milk sugar (lactose)
4	F. ATP synthase	6.	digests proteins

5. Base your answers to the following questions on the graph below and on your knowledge of biology.



6. What is the **optimal pH** for pepsin? 3

7. Is this pH **acid** or **basic**? acidic

8. In what **organ of the digestive system** does pepsin work? stomach

9. What is the **optimal pH** for trypsin? 8

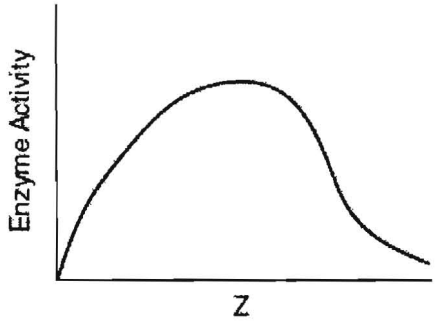
10. In what **organ of the digestive system** does trypsin work? small intestine

11. Is this pH **acid** or **basic**? basic

12. Neither enzyme works at a pHs of 12, 13, 14

13. An incomplete graph is shown below. What **two** internal body conditions could appropriately be used to replace letter Z on the axis?

Effect of Z on Enzyme Activity



pH temperature

14. What kind of organic molecule is an enzyme? protein

15. List 2 internal environmental factors that affect how well enzymes function.

pH temp

16. What happens to water when you heat it to 100°C?

it boils

17. What happens to proteins dissolved in that water when you heat it to 100°C?

They become denatured & are no longer able to work

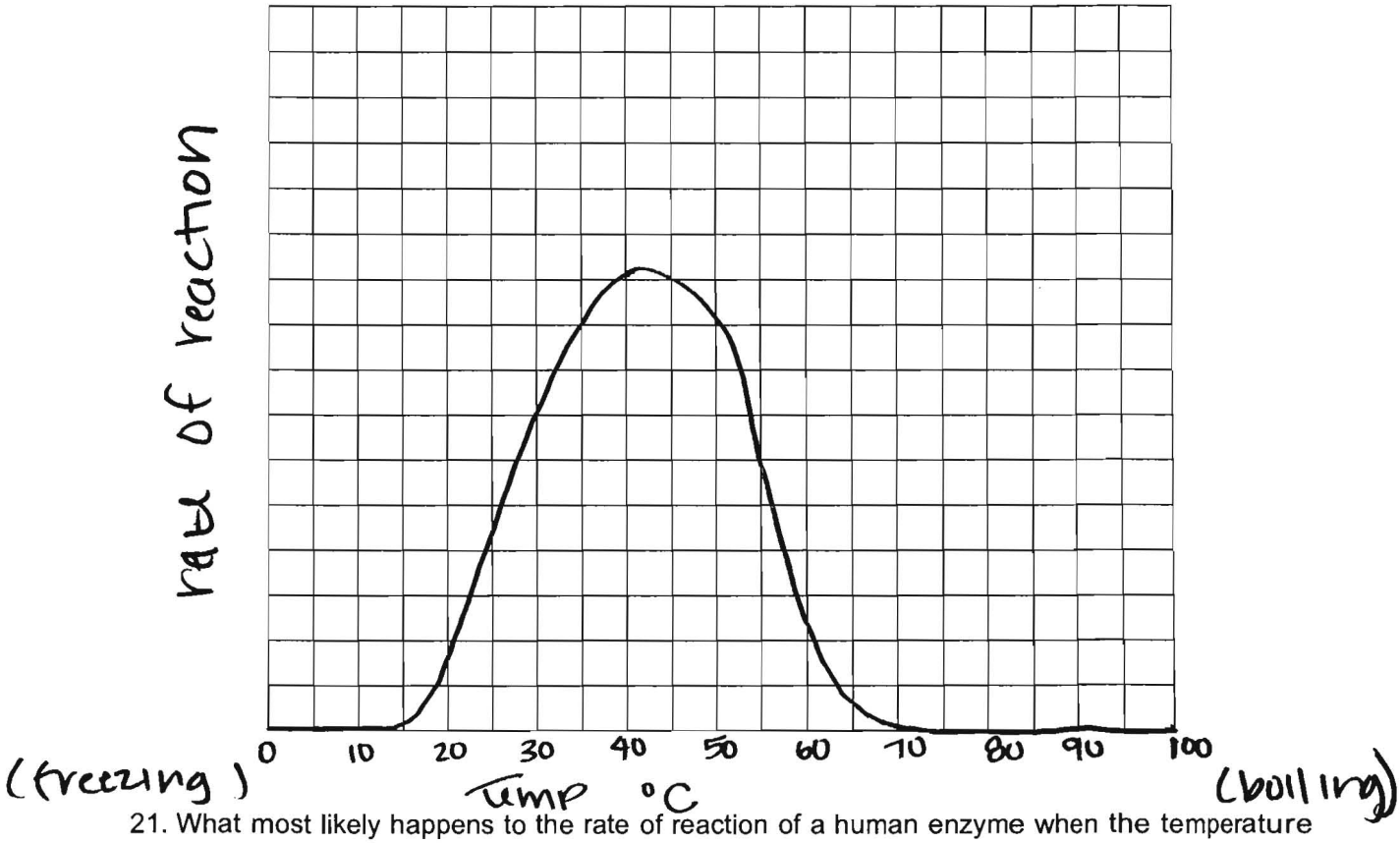
18. What specific change happens to an enzyme that stops it from working when you heat it?

the hydrogen bonds that create the shape of the protein are broken

19. Explain why changing the shape of an enzyme could affect the ability of the enzyme to function.

Each enzyme has a specific shape to match the substrate if it's shape doesn't match, it won't be able to work

20. Draw a generalized graph of the action of an **enzyme from the human body** as the temperature changes from 0°C to 100°C. Mark the temperature of **optimal enzyme activity**.



21. What most likely happens to the rate of reaction of a human enzyme when the temperature is increased gradually from 10°C to 30°C. Explain your answer.

It will increase - molecules are moving faster as they warm up so they are more likely to interact.

22. What most likely happens to the rate of reaction of a human enzyme when the temperature is increased gradually from 40°C to 90°C. Explain your answer.

It quickly drops off because at higher temperatures, the proteins become denatured & can't work

23. What is the optimal temperature for the functionality of a human enzyme? _____

30-40° C