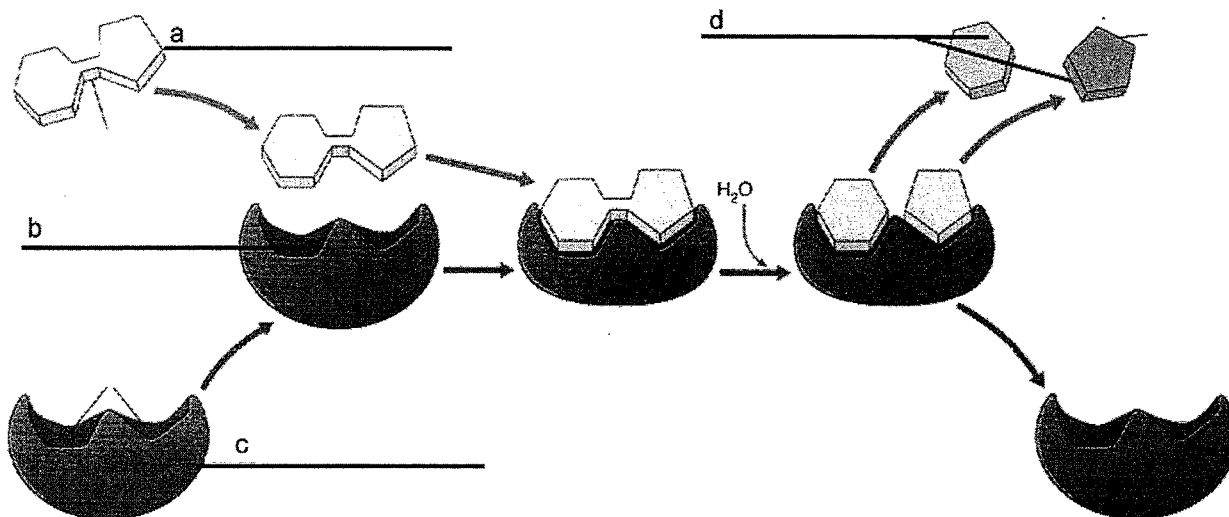


Name:

## ENZYME PRACTICE

### Part I

1. Label the diagram



2. Answer true or false to the following statements:

- \_\_\_\_\_ Enzymes interact with specific substrates
- \_\_\_\_\_ Enzymes change shape after a reaction occurs
- \_\_\_\_\_ Enzymes speed up reactions.
- \_\_\_\_\_ One enzyme can be used for many different types of chemical reactions.
- \_\_\_\_\_ Enzyme reactions can be slowed or halted using inhibitors.

3. Circle the correct effect.

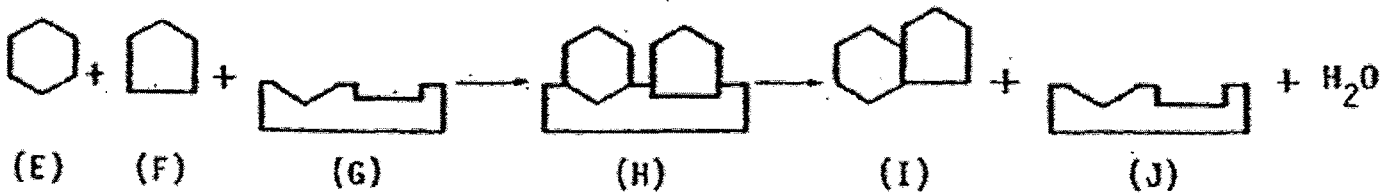
- Raising the temperature slightly will [ increase | decrease | not change ] the rate of reaction
- Boiling temperature will [ increase | decrease | not change ] the rate of reaction.
- Changing the pH toward the optimal pH will [ increase | decrease | not change ] the rate of reaction.
- Introducing a competitive inhibitor will [ increase | decrease | not change ] the rate of reaction.

4. Place a check mark next to the things that are expected to INCREASE the rate of an enzymatic reaction

- \_\_\_\_\_ Add more enzyme
- \_\_\_\_\_ Add more substrate
- \_\_\_\_\_ Adjust pH to optimal level
- \_\_\_\_\_ Freezing

Name:  
Part II:

Examine the reaction pictured below and answer the questions that follow:



1. Which letter(s) represent the enzyme? \_\_\_\_\_
2. Which letter(s) represent the substrate? \_\_\_\_\_
3. Circle the active site on enzyme that will join with the substrates.
4. Which letter represents the product of the reaction? \_\_\_\_\_
5. What type of reaction is shown above? How do you know?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. Why is water considered a metabolic waste? \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

7. What does H represent? \_\_\_\_\_

8. Match the following words with their definitions.

- \_\_\_\_\_ Product
- \_\_\_\_\_ Active site
- \_\_\_\_\_ Enzymes
- \_\_\_\_\_ Catalyst
- \_\_\_\_\_ Substrate
- \_\_\_\_\_ Activation energy

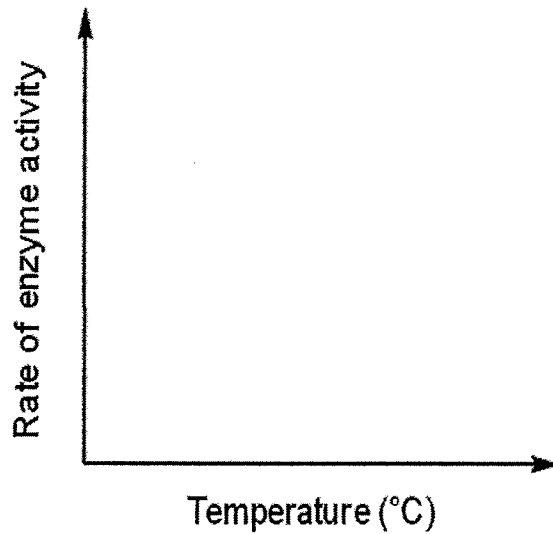
- a. Amount of energy required for a chemical reaction to occur.
- b. Substances that bring about a chemical reaction without being changed itself.
- c. Substance that enzymes act upon.
- d. Regions on the surface of enzymes that fit the substrate.
- e. Substance formed from the substrate at the end of a chemical reaction with an enzyme.
- f. Proteins that speed up chemical reactions.

Name:

**Part IV: Factors that affect enzyme action**

Complete the graphs below:

**a. The effect of temperature and pH on enzyme activity**



a-1. What is the optimal temperature for enzymes to function in humans in °C? \_\_\_\_\_

a-2. Explain what happens to an enzyme during denaturation \_\_\_\_\_

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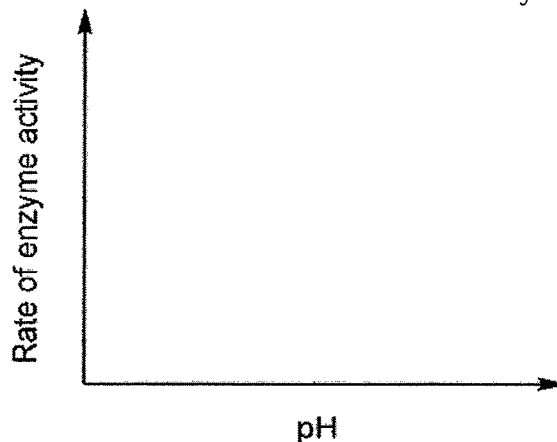
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a-3. What happens to enzyme activity as the temperature decreases?

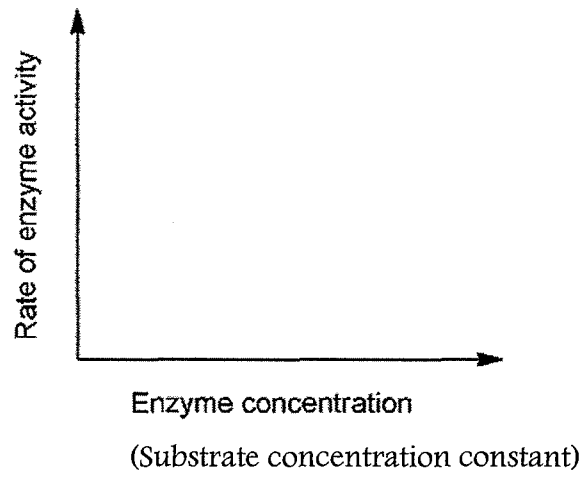
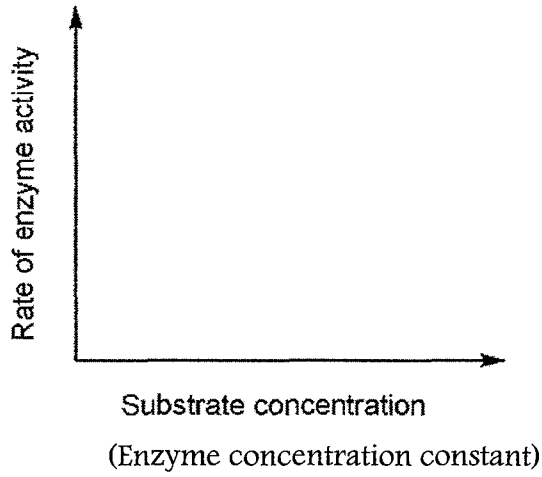
**b. The effect of pH on enzyme activity**

Label units on the pH scale from 1-10. Draw in an enzyme that functions in a pH range from 2-5 and a second enzyme that functions in a pH range from 4-9



Name:

**c. The effect of enzyme and substrate concentrations on enzyme activity**



**Part V: Answer the following questions**

1. Explain the differences between the lock and key theory of enzyme action and the induced fit theory. \_\_\_\_\_

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2. What is a co-enzyme? \_\_\_\_\_

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3. What is meant by enzyme specificity? \_\_\_\_\_

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