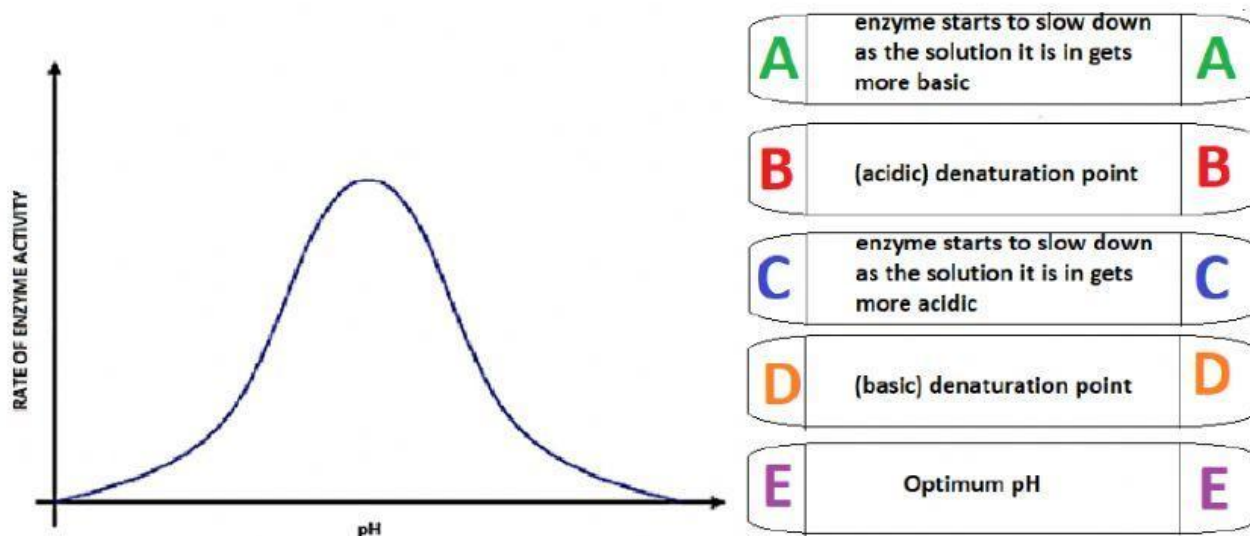


NAME: _____ DATE: _____

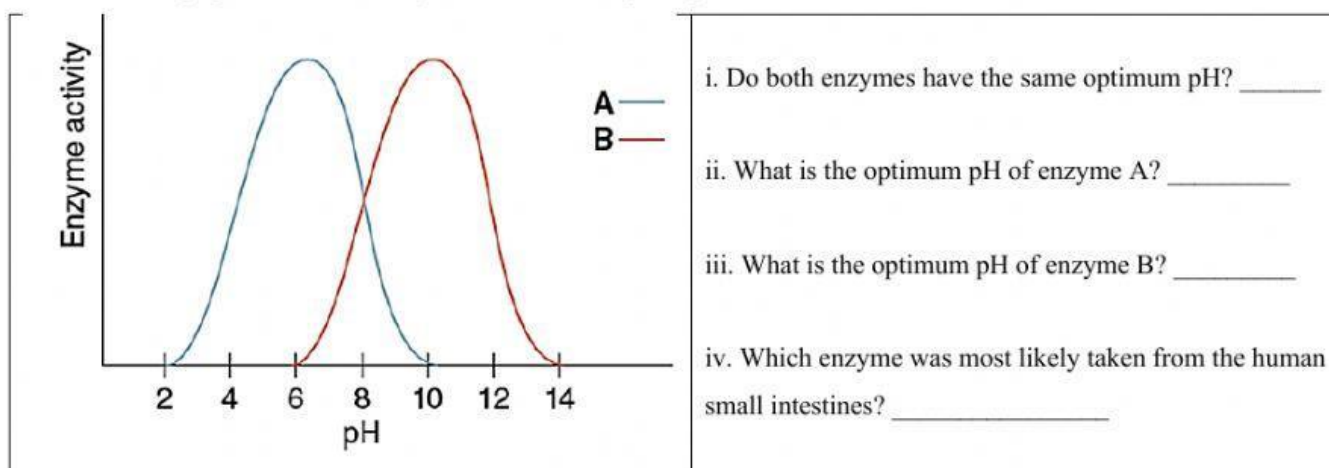
ENZYMES, TEMPERATURE AND pH

1. Enzymes that work on carbohydrates are called _____
2. Enzymes that work on fats are called _____
3. Enzymes that work on proteins are called _____

4a. Below is a graph of how pH affects the reactivity of an enzyme. Drag the following labels into place on the graph.



4b. Look at the graph of how two enzymes react to changes in pH.



5. Lipase is an enzyme that breaks down fats. We can use an indicator to follow this reaction. The indicator is red to start with but turns **yellow** when all the fat has been broken down. Use the information to answer the questions below.

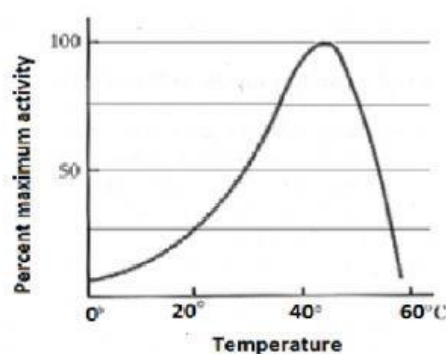
TEST-TUBE	TEMP / °C	INITIAL COLOUR	FINAL COLOUR
1	0	RED	RED
2	10	RED	ORANGE
3	40	RED	YELLOW
4	60	RED	ORANGE
5	100	RED	RED

- At what temperature does lipase work best? _____ °C
- The colour did not change in test-tube 1 because the _____ in the test-tube was too _____.
- The colour did not change in test-tube 5 because the _____ in the test-tube was too _____.
- Predict an end colour if we heated test-tube 1 to 40°C. _____
- Predict an end colour if we cooled test-tube 5 to 40°C. _____

6. A number of factors can affect the rate of an enzyme-controlled reaction. State if each of the following would **INCREASE, DECREASE, HAVE NO EFFECT** on the reactivity of the enzyme.

- Increasing the amount of enzyme. _____
- Decreasing temperature. _____
- Forgetting to add the substrate at the start of the enzyme reaction. _____
- A more acidic pH from the optimum. _____

7. Below is a graph of how temperature affects the reactivity of an enzyme. Drag the following labels into place.



- | | | |
|----------|---------------------------------|----------|
| A | Deactivation point | A |
| B | Enzyme active site losing shape | B |
| C | Denaturation point | C |
| D | Optimum temperature | D |
| E | Enzyme activity speeding up | E |

- What temperature gives 25% enzyme activity? _____ °C
- At 30°C we would achieve _____ % enzyme activity.