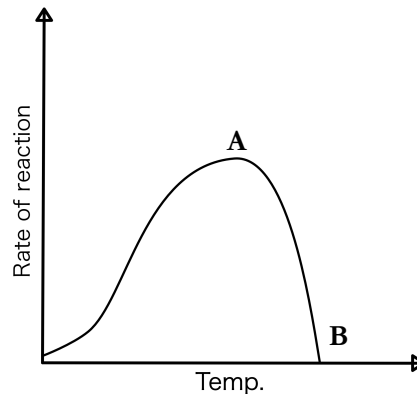# Factors Affecting Enzyme Action

**1**   Consider the graph below:

Label the optimum temperature for the enzyme as 'A'

Label the point at which the enzyme has been completely denatured as B



*[ 2 marks ]*

**2**   Explain why the rate of reaction initially increases with temperature

-   As temperature increases the molecules have more energy
-   So collide more often
-   And with more energy
-   Meaning more successful collisions and a faster rate

*[ 2 marks ]*

**3**   The graph below shows rate of reaction data for 2 different enzymes. One of these enzymes are found in the stomach, the other is found in the mouth.
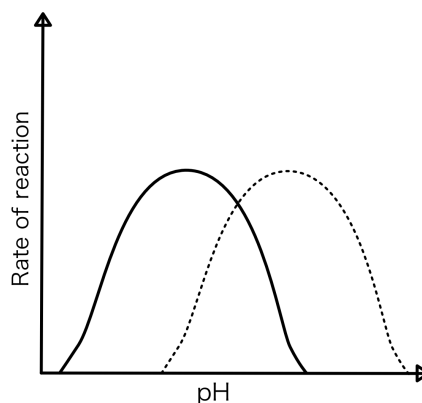


a) Which of these lines is more likely to indicate the enzyme found in the stomach? Explain your answer.

-   The solid black line
-   As that is at a lower pH and the stomach is very acidic, with a pH of 2.

*[ 2 marks ]*

b) Both these enzymes have the same optimum pH, TRUE or FALSE?

- False

*[ 1 marks ]*

**4**   Explain, in terms of bonding, why the rate of reaction gradually falls once the pH increases above the optimum rather than denaturing straight away

- The bonds around the active site start to break
- So the active site changes shape
- Which means that the substrate can no longer fit as well
- And so less enzyme-substrate complexes will form and less product will be made

*[ 3 marks ]*

**5**   An enzyme controlled reaction was carries out at 36*C. After 3 minutes, 240 cm³ of product had been produced. Calculate the rate of reaction is cm³/s

240 cm³ / 180 s

Rate of reaction = 1.33  cm³/s

*[ 2 marks ]*

*[ Total 11 marks ]*