

3.2 Factors that Affect Enzyme Action

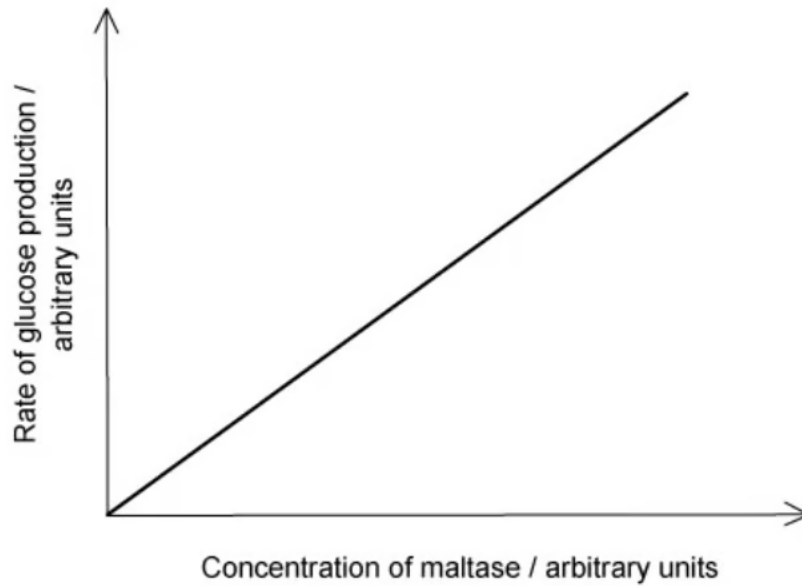
Question Paper

Course	CIEA Level Biology
Section	3. Enzymes
Topic	3.2 Factors that Affect Enzyme Action
Difficulty	Medium

Time allowed: 20
Score: /10
Percentage: /100

Question 1

The graph shows the rate of glucose production with increasing concentration of maltase.



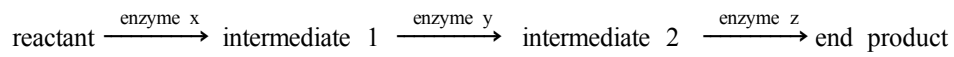
To get a graph with a linear correlation like this which procedure would not be necessary?

- A. ensure temperature remained constant
- B. ensure there is sufficient maltose availability
- C. ensure pH remained constant
- D. ensure there is sufficient glucose availability

[1 mark]

Question 2

This diagram shows a metabolic pathway.



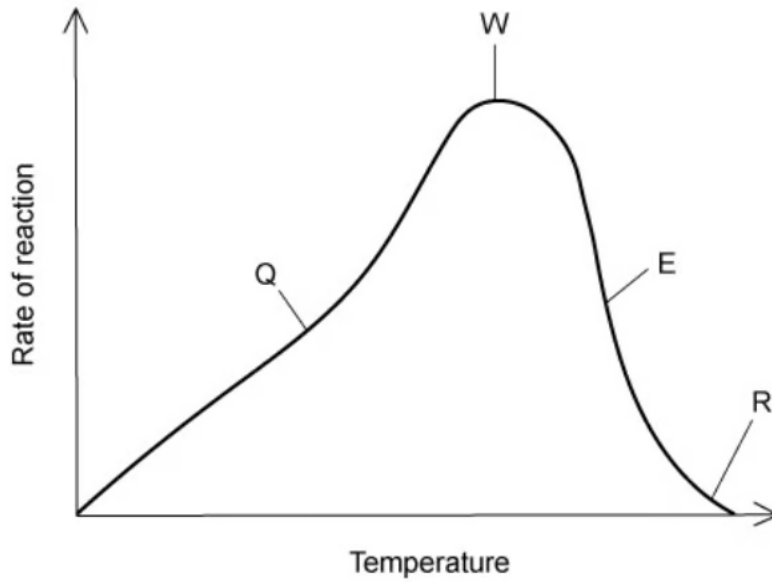
What would be the effect of adding a competitive inhibitor of enzyme z?

- A. intermediate 2 would increase in concentration
- B. enzyme z would be denatured
- C. no more end product would be made
- D. rate of reaction of enzyme x would slow

[1 mark]

Question 3

This graph shows the effect of temperature on enzyme activity



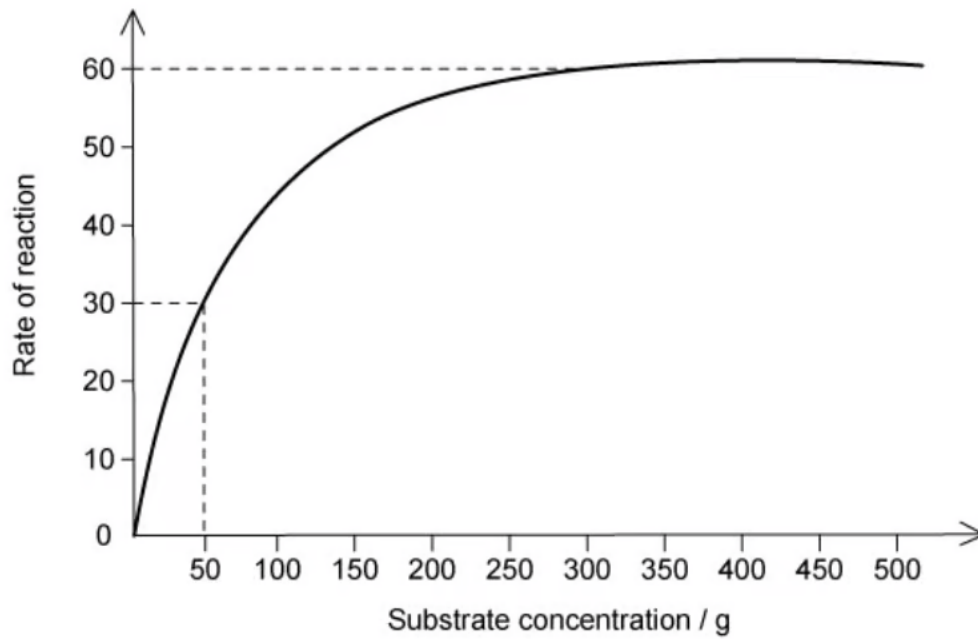
Which statement is not true?

- A. At W the kinetic energy of the substrate is highest
- B. At R the enzyme is completely denatured
- C. At W the rate of enzyme/substrate formation is the highest
- D. At E bonds in the enzyme have started to break

[1 mark]

Question 4

This graph shows the effect of increasing substrate on enzyme activity



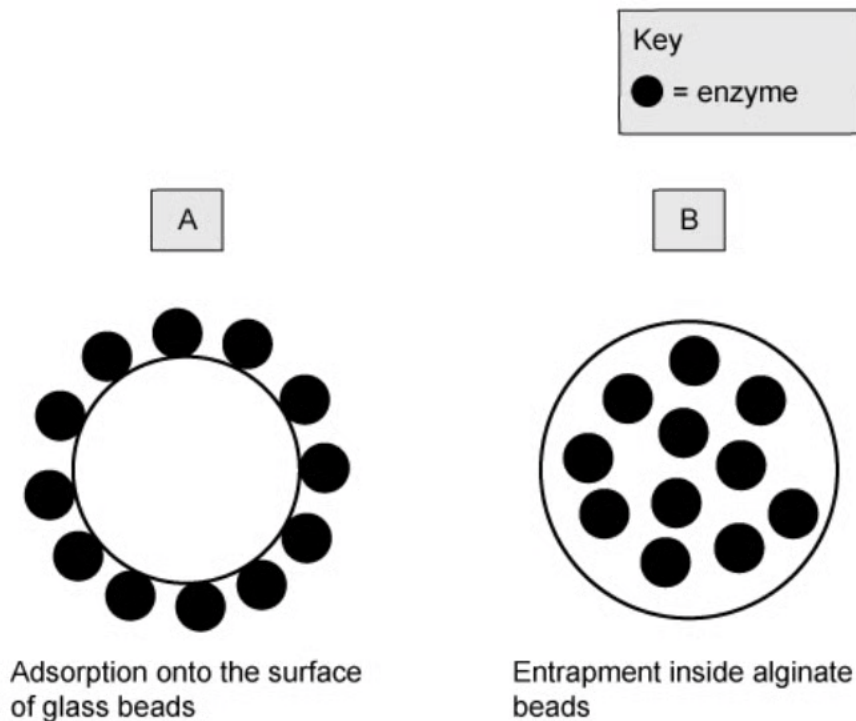
What is the K_m value?

- A. 50g
- B. 250g
- C. 350g
- D. 500g

[1 mark]

Question 5

Enzymes can be immobilised in various ways. The diagram below shows two different ways of immobilisation



Immobilised lactase enzymes are used to make milk digestible for lactose intolerant people. A student carried out an investigation to compare the activity of the enzyme lactase that had been immobilised in the two different ways shown.

A solution containing 50 mg cm^{-3} of lactose was poured through a column containing the immobilised enzyme. The solution containing the products was collected and the concentration of glucose measured.

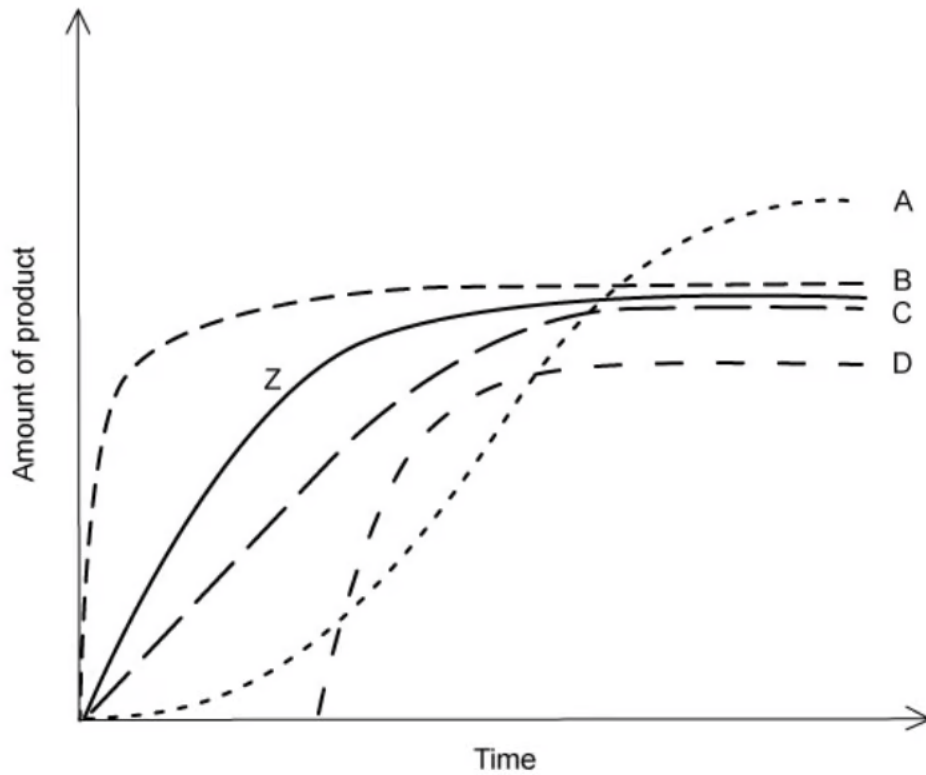
What is the independent variable for this experiment?

- A. The amount of lactose in the solution before pouring through the column.
- B. The amount of glucose in the milk after pouring through the column.
- C. The type of enzyme immobilization.
- D. The temperature of the solution.

[1 mark]

Question 6

In the graph, Z represents the rate of an enzyme reaction under optimal conditions and without an inhibitor.

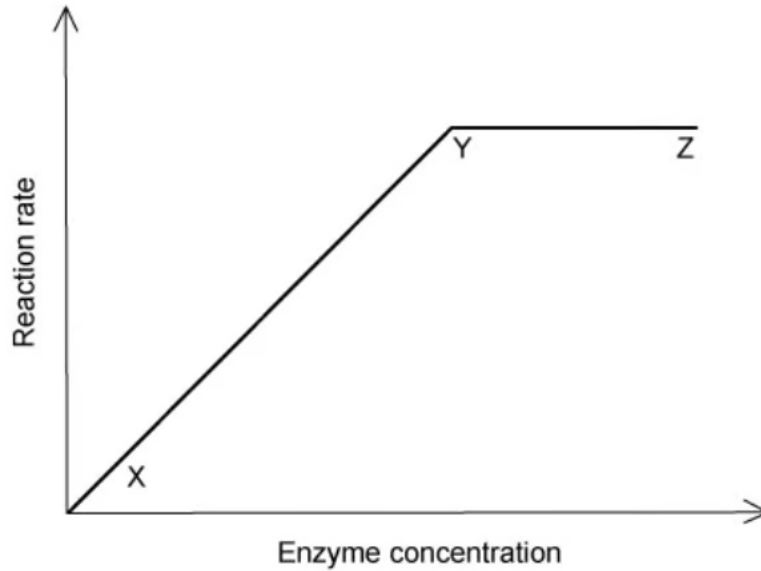


Which curve would represent the same experiment carried out in the presence of a low concentration of competitive inhibitor?

[1 mark]

Question 7

The graph shows the effect of enzyme concentration on the rate of an enzyme-controlled reaction. The substrate concentration is constant.



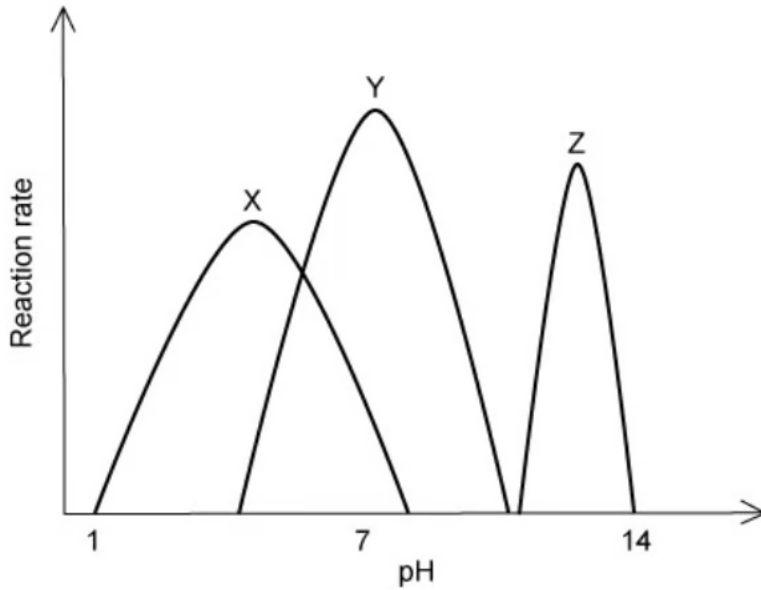
Which statement about the graph is correct?

- A. Between **X** and **Z** the number of enzyme molecules is limiting
- B. Between **Y** and **Z**, the number of enzyme molecules is limiting
- C. Between **X** and **Z**, the number of substrate molecules is limiting
- D. Between **Y** and **Z**, the number of substrate molecules is limiting

[1 mark]

Question 8

The graph shows the effect of pH on the rate on three different enzyme-controlled reactions. The enzyme concentration is constant.



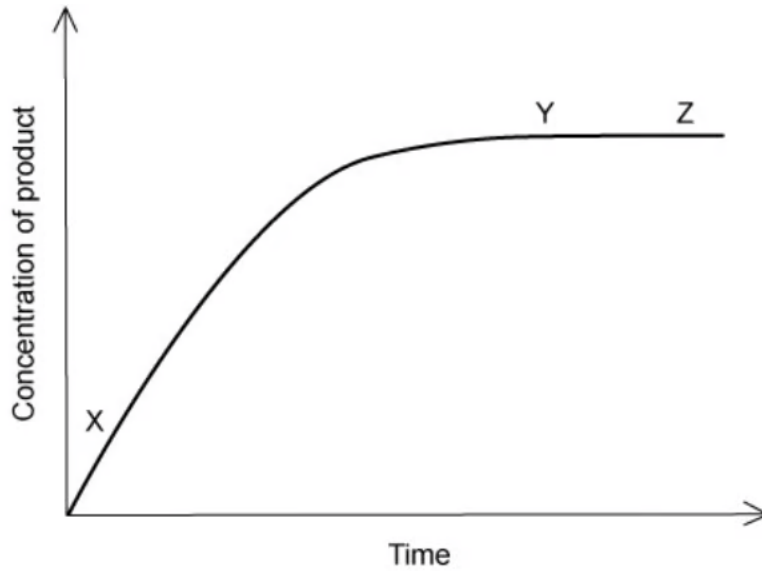
Which statement about the graph is correct?

- A. At its optimum pH, enzyme **Z** has the fastest rate
- B. There is no pH in which both **X** and **Y** have a functional active site
- C. Enzyme **X** has a functional active site across the widest range of pH's
- D. Enzyme **Y** has a functional active site across the narrowest range of pH's

[1 mark]

Question 9

The graph shows the course of an enzyme-catalysed reaction at 25 °C.



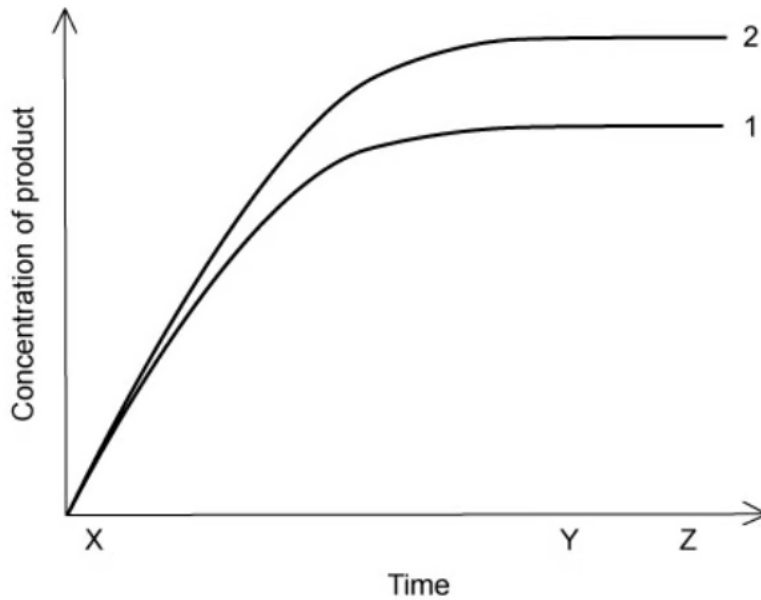
Which statement about the graph is incorrect?

- A. At **X** the number of available substrate molecules is high
- B. At **X** the number of enzyme/substrate complexes is the same as **Y**
- C. At **Z** the number of available substrate molecules is low
- D. At **Y** the number of enzyme/substrate complexes is the same as **Z**

[1 mark]

Question 10

The graph shows the course of two enzyme-catalysed reaction at 30 °C. The only thing that was changed between experiment 1 and 2 was some additional substrate was added at the beginning of experiment 2



Which statement about the experiment is not true?

- A. At **X** the number of enzyme/substrate complexes is the same in both 1 and 2
- B. At **X** the limiting factor in both experiment 1 and 2 is enzyme availability
- C. At **Z** there are still enzyme/substrate complexes forming in experiment 2
- D. At **Y** there are no more enzyme/substrate complex forming in experiment 1

[1 mark]