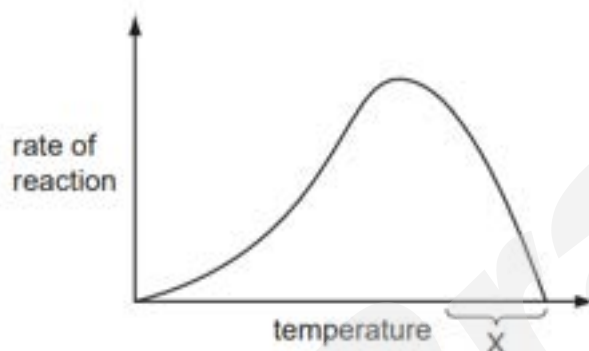


5. Enzymes

(Past Year Topical Questions 2010-2015)

May/June 2010 (11)

11 The graph shows how the rate of an enzyme-controlled reaction changes with temperature.

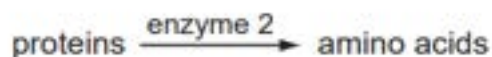
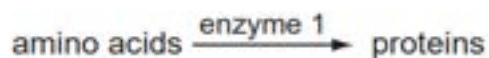


What is happening within the temperature range marked X?

- A The enzyme is becoming denatured.
- B The enzyme is being used up.
- C The reaction is occurring at body temperature.
- D The reaction is occurring at the optimum temperature.

Oct/Nov 2010 (11)

10 Two enzyme-controlled reactions are shown.



From these reactions, what deduction can be made about enzymes?

- A Enzyme 1 has been changed to enzyme 2.
- B Enzyme 2 slows down the production of amino acids.
- C Enzymes can build up large molecules.
- D Enzymes only break down large molecules.

May/June 2011 (11)

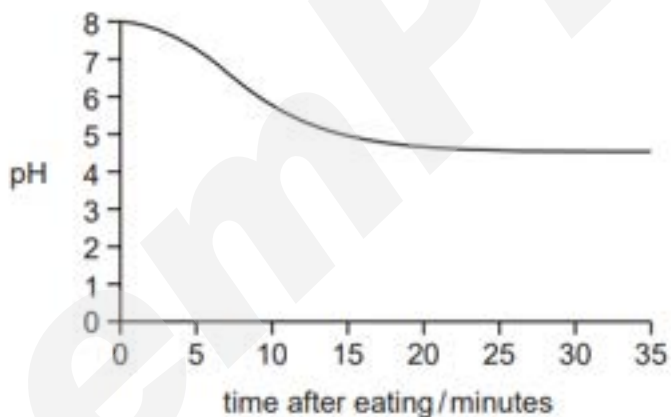
12 What are enzymes made of?

- A carbohydrates
- B DNA
- C fats
- D proteins

13 At which temperature do most enzymes from the human body become completely denatured?

- A 0°C
- B 27°C
- C 40°C
- D 65°C

14 The graph shows pH changes in the mouth after eating.



Why is it a good idea to brush teeth after eating?

- A Acidic conditions help bacteria to grow.
- B Acids dissolve tooth enamel.
- C Alkaline conditions help bacteria to grow.
- D Alkalis dissolve tooth enamel.

Oct/Nov 2011 (11)

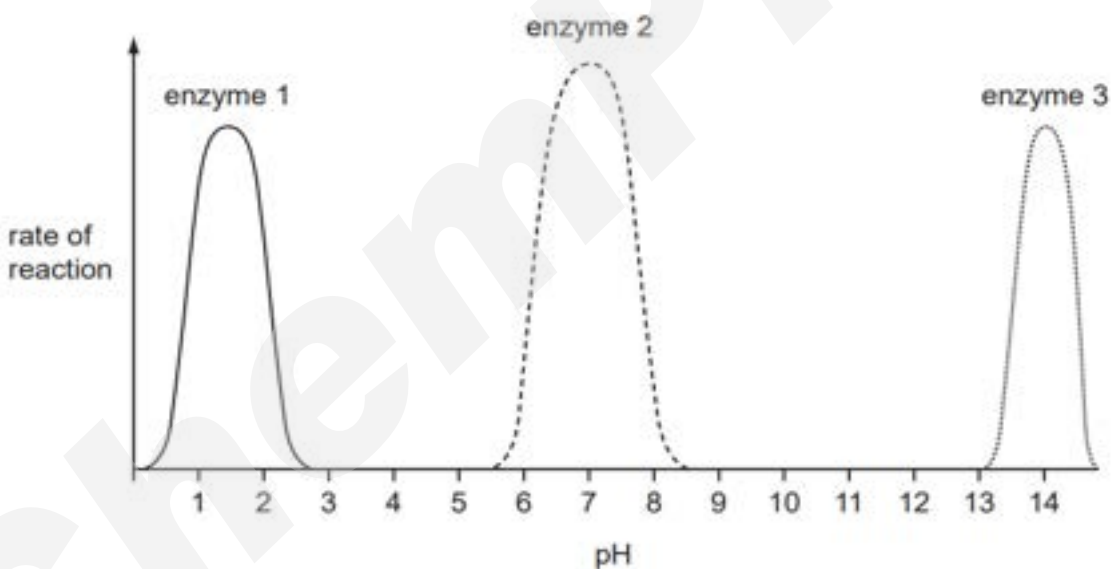
11 A human digestive enzyme breaks down its substrate at a fast rate at 35 °C.

What would occur if the enzyme and substrate were kept at 75 °C?

- A The enzyme would stop working and be denatured.
- B The reaction would continue at the same rate.
- C The reaction would take place more quickly.
- D The reaction would take place more slowly.

Oct/Nov 2012 (11)

11 The graph shows the effect of pH on the rate of reaction of three different enzymes.



What does the graph show?

- A Each enzyme works best at a different pH.
- B Each enzyme works best over a narrow temperature range.
- C Enzymes work best in acid conditions.
- D Enzymes work best in alkaline conditions.

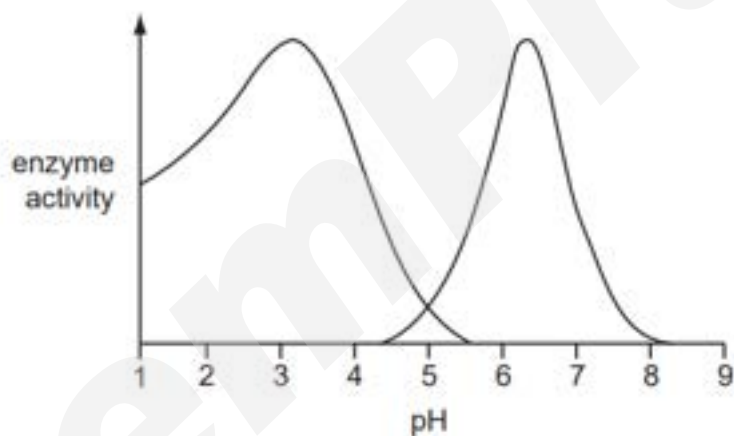
12 Some plants digest insects and use the nutrients for growth.

What must these plants produce to digest the insects?

- A acids
- B alkalis
- C enzymes
- D hormones

Oct/Nov 2012 (13)

12 The graph shows the effect of pH on the activity of two enzymes.



At which pH is the activity of both enzymes the same?

- A 1
- B 3
- C 5
- D 8

May/June 2013 (12)

11 The temperature of an enzyme-controlled reaction is increased by 10 °C.

How does this affect the rate of reaction?

- A It always increases the rate.
- B It always decreases the rate.
- C It may increase or decrease the rate.
- D It has no effect on the rate.

12 In an experiment, the effect of temperature on the action of amylase is investigated.

Six different test-tubes are set up, each containing a mixture of amylase and starch solution.

Which condition should **not** be kept the same in each of the six test-tubes?

- A concentration of amylase
- B pH
- C temperature
- D volume of starch solution

Oct/Nov 2013 (11)

12 Which statement is correct for all catalysts?

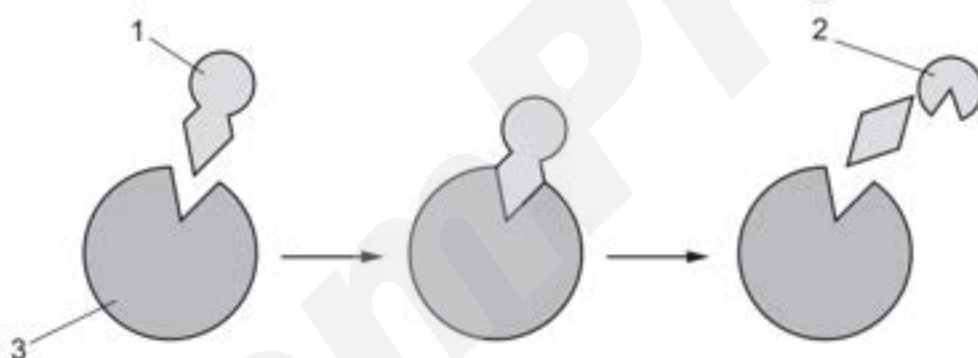
- A They are enzymes.
- B They are proteins.
- C They speed up chemical reactions.
- D They work in living organisms.

May/June 2014 (11)

- 11 What is a characteristic of all catalysts?
- A They are broken down in the reaction.
 - B They are made of protein.
 - C They are not changed by the reaction.
 - D They do not change the rate of the reaction.

May/June 2014 (12)

- 11 The diagram shows the lock and key model of enzyme action.



Which is the enzyme and which is the substrate?

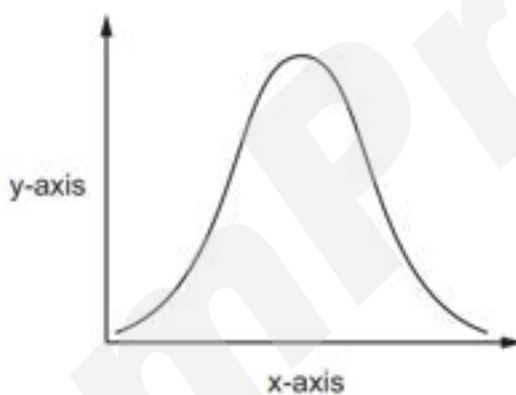
	enzyme	substrate
A	1	2
B	1	3
C	3	1
D	3	2

Oct/Nov 2014 (11)

10 What happens to most enzymes above 60 °C?

- A They are denatured.
- B They are destroyed by white blood cells.
- C They are digested.
- D They are made more active.

11 An experiment was carried out to investigate the effect of pH on enzyme action. The graph shows the results.



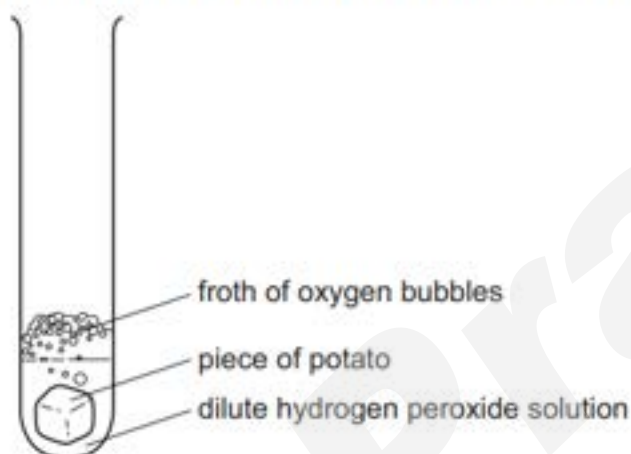
What are the labels for the x-axis and the y-axis?

	x-axis	y-axis
A	pH	rate of reaction
B	pH	time
C	rate of reaction	pH
D	time	pH

Oct/Nov 2014 (13)

- 11 The enzyme catalase, found in potato, speeds up the breakdown of hydrogen peroxide. The reaction releases a froth of oxygen bubbles.

The diagram shows an experiment to find the effect of changes in pH on the rate of this reaction.



The table shows the time taken for the froth of bubbles to reach the top of the test-tube at different pH values.

pH	minutes
4	4
5	3
6	1
7	2

Which pH is nearest to the optimum (best) for this enzyme?

- A pH 4 B pH 5 C pH 6 D pH 7

May/June 2015 (12)

11 An enzyme in potato cells causes oxygen to be produced from hydrogen peroxide.

Cubes of potato were incubated with hydrogen peroxide at different temperatures.

The numbers of bubbles of oxygen released per minute were counted at each temperature.

The table shows the results.

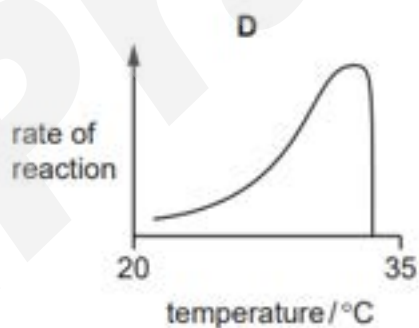
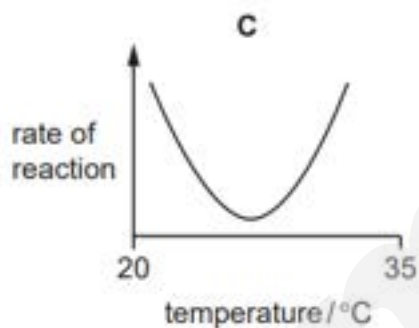
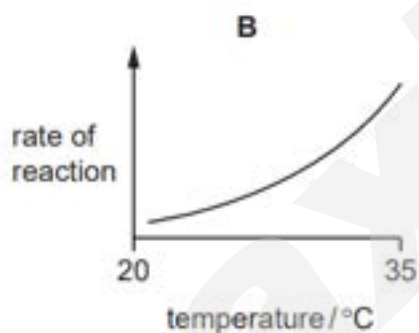
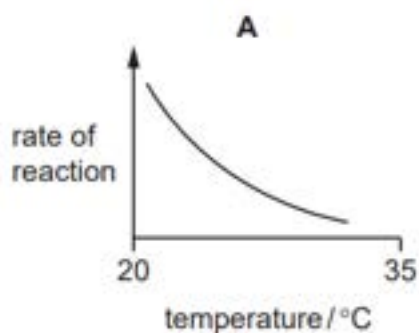
temperature / °C	15	25	35	45	55
number of bubbles / bubbles per minute	96	98	82	36	1

The results suggest the optimum temperature for the enzyme is between which two values?

- A 15 °C and 35 °C
- B 35 °C and 45 °C
- C 35 °C and 55 °C
- D 45 °C and 55 °C

May/June 2015 (13)

12 Which graph shows the effect of temperature between 20°C and 35°C on the activity of a human digestive enzyme?



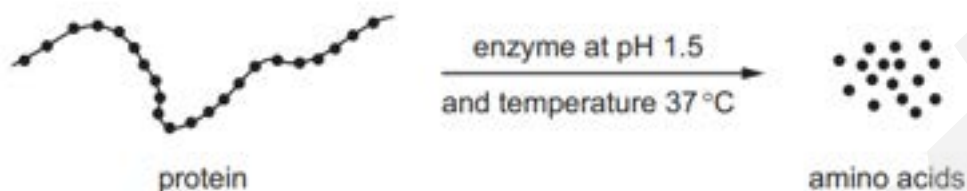
Oct/Nov 2015 (11)

12 What is true of all enzymes?

	they are sugars	they are most effective at pH7
A	✓	✓
B	✓	x
C	x	✓
D	x	x

Oct/Nov 2015 (12)

11 The diagram shows the effect of an enzyme working in the human digestive system.



What would **reduce** the rate of production of amino acids?

- A removing the amino acids as they are formed
- B increasing the amount of protein
- C raising the temperature to 40 °C
- D raising the pH to 7.5

Oct/Nov 2015 (13)

11 Which group of compounds ensures that metabolic reactions take place effectively?

- A carbohydrates
- B enzymes
- C fatty acids
- D hormones