

CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

SCIENCE (CHEMISTRY, BIOLOGY)

PAPER 1 Multiple Choice

5126/1

OCTOBER/NOVEMBER SESSION 2002

1 hour

Additional Materials:

Multiple Choice answer sheet

Soft clean eraser

Soft pencil (type B or HB is recommended)

TIME 1 hour

INSTRUCTIONS TO CANDIDATES

Do not open this booklet until you are told to do so.

Write your name, Centre number and candidate number on the answer sheet in the spaces provided unless this has already been done for you.

There are **forty** questions in this paper. Answer **all** questions. For each question there are four possible answers, **A, B, C** and **D**. Choose the one you consider to be correct and record your choice in **soft pencil** on the separate answer sheet.

Read very carefully the instructions on the answer sheet.

INFORMATION FOR CANDIDATES

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

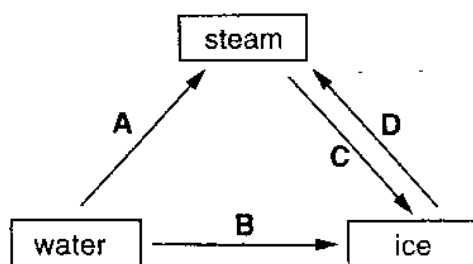
Any rough working should be done in this booklet.

A copy of the Periodic Table is printed on page 16.

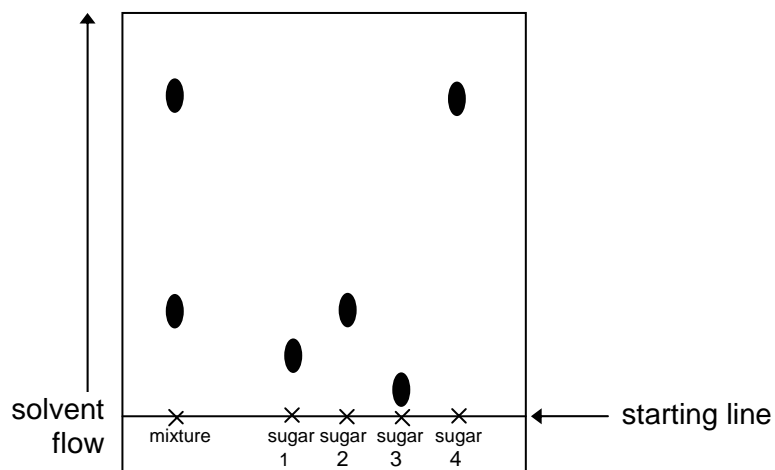
This question paper consists of ? printed pages and ? blank pages.

**All of the questions in this paper are taken
from 5154/1 November 2002**

1 Which change, **A**, **B**, **C**, or **D**, can involve both condensation and freezing?



2 A mixture of two sugars was compared with four different sugars using chromatography. The results are shown in the diagram.



Which two sugars does this mixture contain?

- A** 1 and 2 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

3 The atoms of element **X** have the electronic configuration 2,8,6.

Which statement about element **X** is correct?

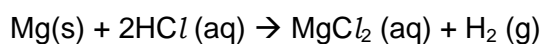
- A** It forms an ionic compound with sodium.
B It forms an ion of charge 2+.
C It has 6 protons in the outer shell of an atom.
D It only reacts with non-metals.

4 The elements **X** and **Y** form the compound X_2Y .

What is the correct electronic configuration of the atoms **X** and **Y**?

	electronic configuration	
	atom of X	atom of Y
A	2,1	2,7
B	2,2	2,7
C	2,1	2,6
D	2,2	2,6

5 Magnesium reacts with hydrochloric acid.



What volume of hydrogen at r.t.p. is produced if 6 g of magnesium reacts with an excess of the acid?

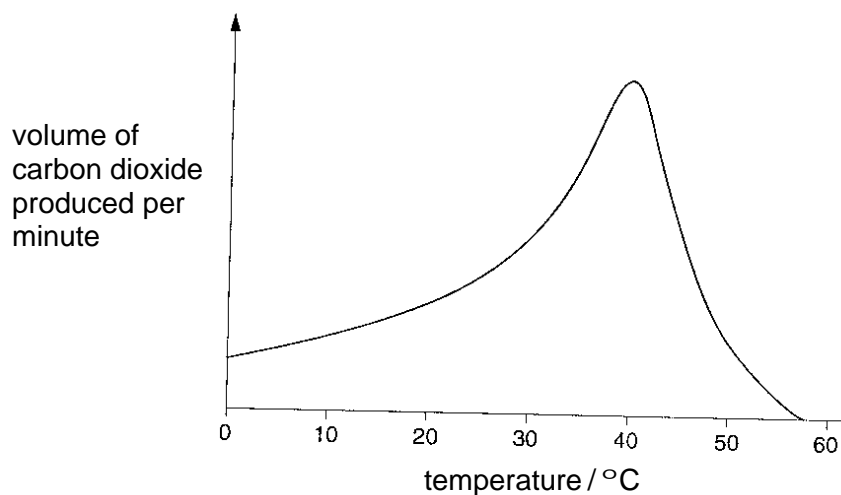
- A 1 dm³
- B 6 dm³
- C 12 dm³
- D 24 dm³

6 Which process is endothermic?

- A the formation of a hydrogen-chlorine bond
- B the formation of rust
- C the formation of water from ice
- D the formation of water from oxygen and hydrogen

7 Ethanol is produced by the fermentation of sugar. During the reaction carbon dioxide is given off.

The graph shows how the volume of carbon dioxide produced per minute varies with temperature.



Using the graph, decide which statement is correct.

- A The rate of reaction always increases with temperature.
- B The rate of reaction reaches a maximum at about 40°C.
- C The reaction is slowest at 0°C.
- D The reaction takes a long time to begin.

- 8 The approximate pH values of aqueous solutions of four substances commonly used in cooking are shown.

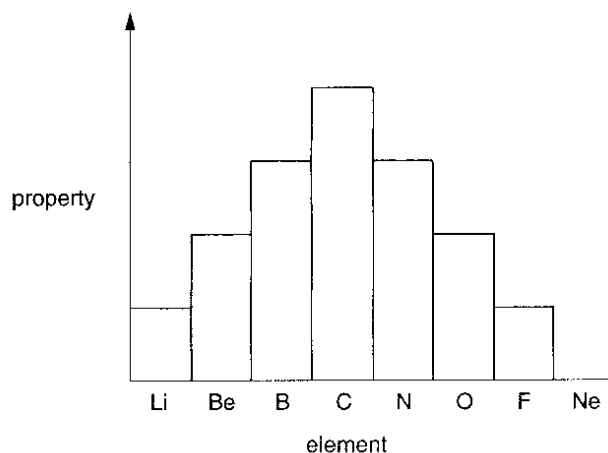
Which substance could be taken to neutralise excess acid in the stomach?

	substance	pH
A	baking soda	9
B	salt	7
C	lemon juice	4
D	vinegar	3

- 9 Which of the following does **not** react with dilute sulphuric acid?

- A magnesium hydroxide
- B magnesium metal
- C magnesium nitrate
- D magnesium oxide

- 10 The bar chart shows the period of elements from lithium to neon.



Which property of these elements is shown on the chart?

- A the number of electrons used in bonding
- B the number of orbits holding electrons
- C the proton (atomic) number
- D the relative atomic mass

11 Four elements in Group VII of the Periodic Table are shown.

chlorine bromine iodine astatine

Which combination of properties is most likely for astatine?

	state at r.t.p.	colour of vapour
A	gas	dark
B	liquid	pale
C	solid	dark
D	solid	pale

12 Which metal can be extracted by heating an ore containing its oxide with carbon?

- A calcium
- B iron
- C magnesium
- D potassium

13 The table shows some metals and their uses.

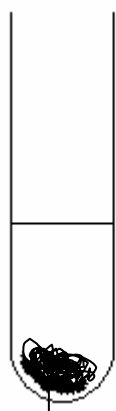
For which metal is the correct reason given for the stated use?

	metal	use	reason
A	aluminium	manufacture of aeroplane wings	strength and high density
B	copper	electrical wiring	good conductor of heat
C	iron	manufacturing stainless steel	rusts
D	zinc	galvanising iron	zinc is more reactive than iron

14 In which tube is hydrogen formed?

dilute hydrochloric acid dilute sulphuric acid dilute sulphuric acid dilute hydrochloric acid





zinc

A



copper

B



copper (II) oxide

C



zinc carbonate

D

15 Carbon monoxide is a pollutant emitted from car exhausts.

Which of its properties makes it harmful to humans?

- A** It has no colour, taste or smell.
- B** It has a corrosive action on lung tissue.
- C** It forms a stable compound with blood.
- D** It combines with oxygen in the lungs.

16 Which statement about an homologous series is **not** correct?

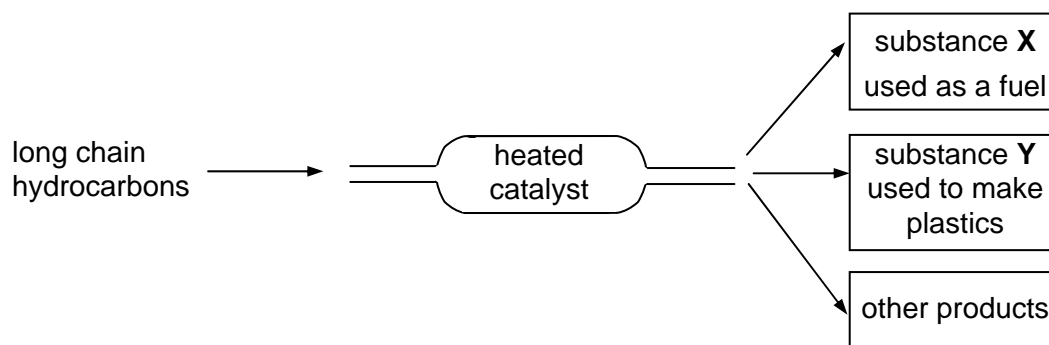
All the members of the series have the same

- A** chemical reactions.
- B** functional group.
- C** general formula.
- D** physical properties.

17 What product is formed when hydrogen reacts with an alkene?

- A** an alcohol
- B** an alkane
- C** an organic acid
- D** a polymer

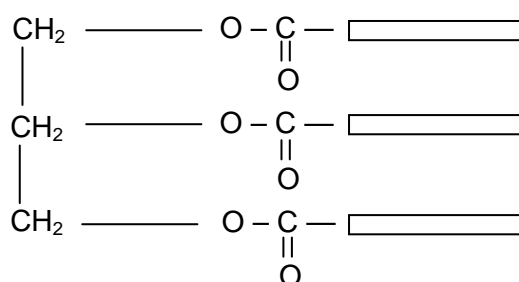
18 The diagram shows how useful products can be obtained by cracking long chain hydrocarbons.



What are **X** and **Y**?

	substance X	substance Y
A	ethanol	propene
B	hydrogen	ethene
C	methane	ethane
D	steam	ethene

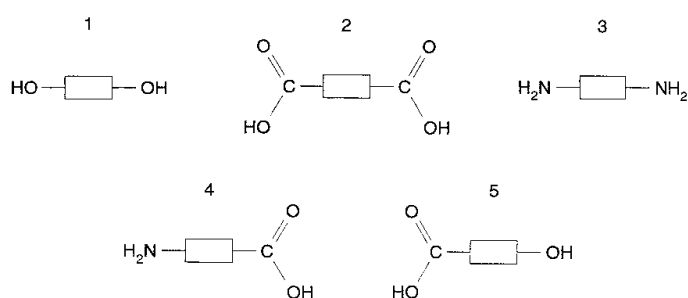
19 A fat molecule can be represented by the diagram shown.



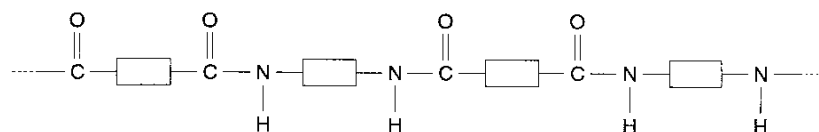
Which other macromolecule possesses the same linkage as a fat?

- A** nylon
- B** protein
- C** starch
- D** *Terylene*

20 The structure of five monomers are shown.



Which pair of monomers will form a polyamide with the following structure?



- A** 1 and 2 **B** 1 and 3 **C** 2 and 3 **D** 4 and 5

21 A new cell is being examined.

Which feature would enable you to identify it as a plant cell or an animal cell?

- A** The cell contains a single large sap vacuole space.
B The cell contains glucose and amino acids.
C The cell contains stored fat.
D The cell surface membrane is partially permeable.

22 Which of these processes require energy from respiration?

	diffusion	osmosis
A	✓	✓
B	✓	7
C	7	✓
D	7	7

key

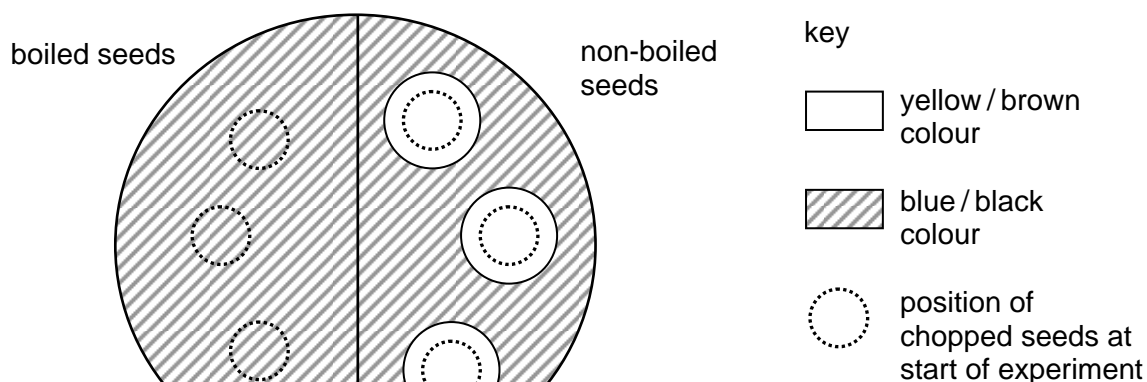
✓ energy required

7 energy not required

23 Six bean seeds were soaked in water for 24 hours. Three of them were then boiled and cooled. The boiled and the non-boiled seeds were chopped up and then placed on the surface of agar jelly containing starch.

After two days, all the seeds were removed and the jelly was flooded with iodine solution.

The diagram shows the result of the experiment.



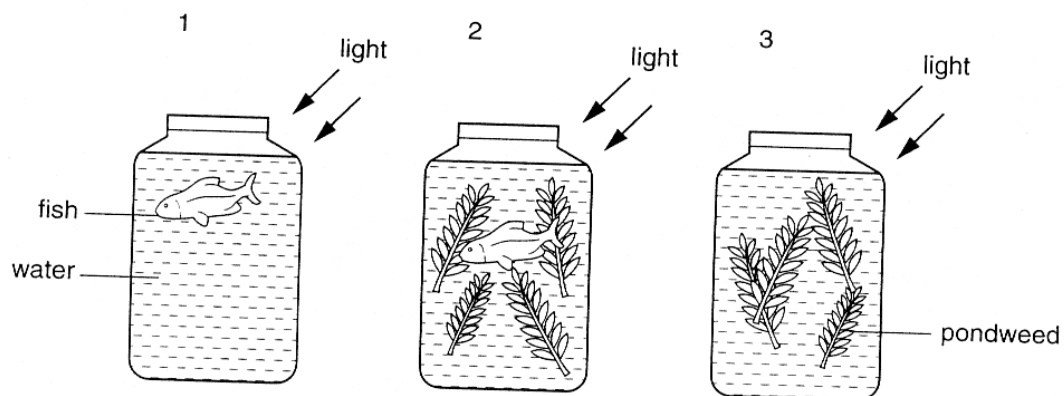
What is the explanation for the results with the non-boiled bean seeds?

- A They absorb iodine.
- B They absorb starch.
- C They secrete acid.
- D They secrete amylase.

24 What is the function of chlorophyll in plants?

- A to absorb carbon dioxide
- B to absorb light
- C to absorb nitrate
- D to absorb water

25 Three sealed jars were set up as shown.



How will the concentration of dissolved carbon dioxide in the water of each jar change?

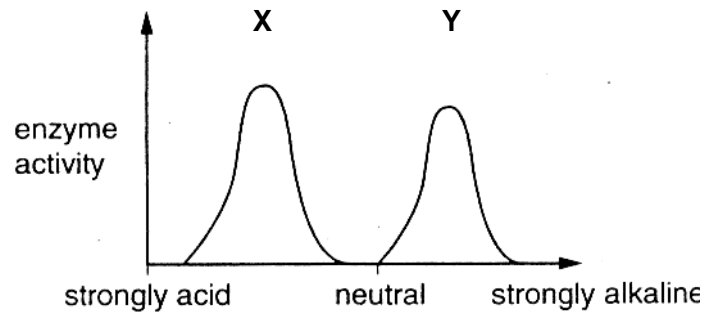
	jar 1	jar 2	jar 3
A	decreases	increases	no change
B	increases	increases	increases
C	increases	no change	decreases
D	no change	decreases	decreases

26 Why is it important to include fibre in the diet?

- A It gives energy to keep the body warm.
- B It helps food pass through the gut.
- C It increases growth in young children.

D It is easy to digest.

27 The diagram shows the effect of pH on the activity of two enzymes, **X** and **Y**, in the alimentary canal.

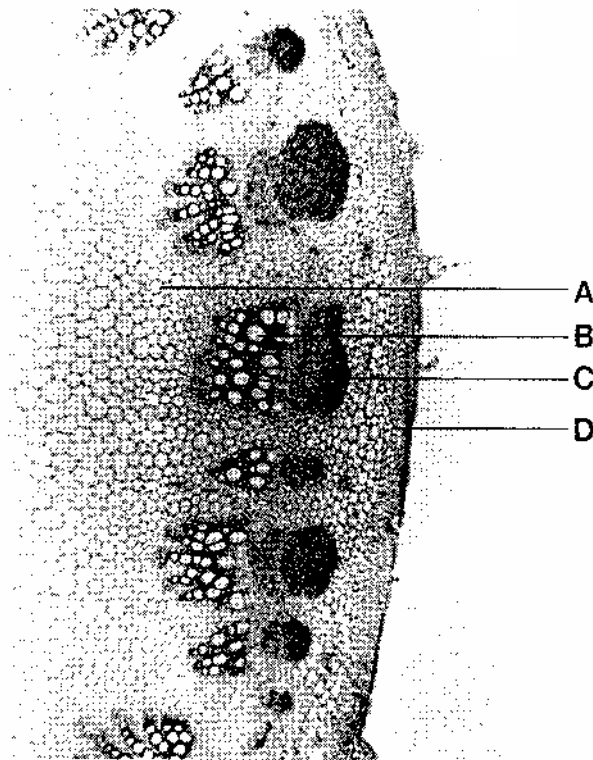


In which regions of the alimentary canal would these enzymes be most active?

	X	Y
A	duodenum	colon
B	duodenum	stomach
C	stomach	colon
D	stomach	duodenum

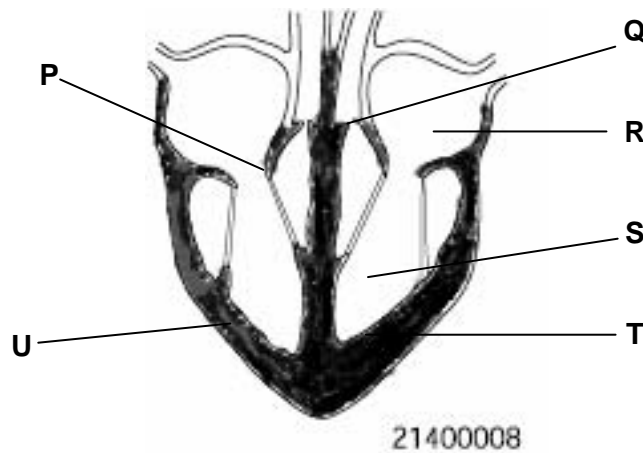
28 The photograph shows a cross-section of part of a sunflower stem under the microscope.

Which tissue transports water and mineral salts?



Artist, this photograph was used in 5090/1 O Level Biology Summer 1996

29 The diagram shows a section through the human heart.



Artist: lighter and uniform shading

What feature suggests that the blood leaves the heart at different pressures, going to the lungs and to the body?

- A chambers **R** and **S** have different volumes
- B the walls of the atria are thinner than the walls of the ventricles
- C valve **P** is stronger than valve **Q**
- D wall **T** is more muscular than wall **U**

30 Which substance builds up in a muscle as a result of anaerobic respiration?

- A carbon dioxide
- B ethanol
- C lactic acid
- D water

31 A person is sitting in a dark room.

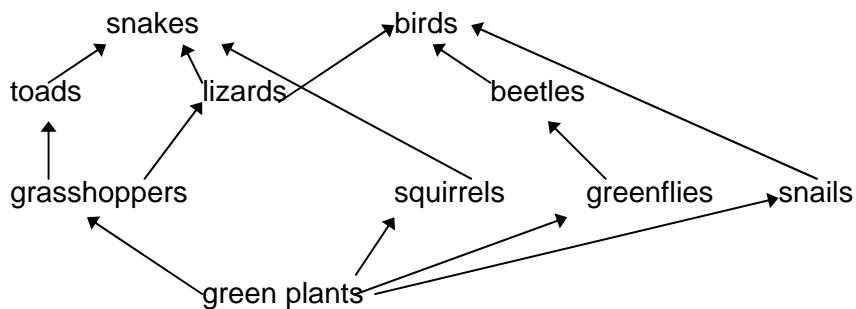
What happens in the eye when a light is switched on?

	circular muscle of iris	size of pupil
A	contracts	decreases
B	contracts	increases
C	relaxes	decreases
D	relaxes	increases

32 Which statement is true about the long-term abuse of both alcohol and heroin?

- A can be taken by injection
- B can increase the risk of AIDS
- C is a stimulant
- D produces only mild withdrawal symptoms

33 The diagram shows a food web in woodland.



In this food web a beetle is

- A a carnivore.
- B a decomposer.
- C a herbivore.
- D a producer.

34 Which processes return carbon dioxide into the atmosphere?

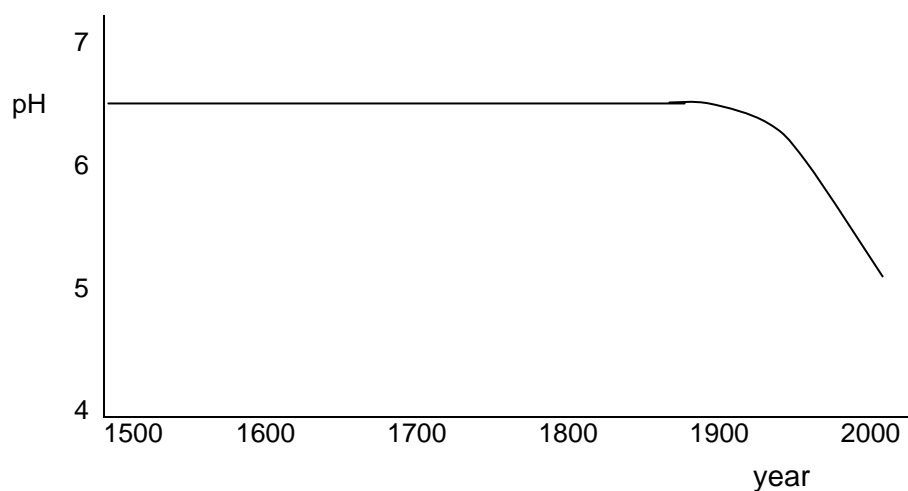
- A combustion and feeding
- B feeding and photosynthesis
- C photosynthesis and respiration
- D respiration and combustion

35 Rivers are often used to dispose of waste substances.

Which substance, when disposed of, pollutes the river for the **shortest** time?

- A hot water
- B insecticides
- C mercury
- D sewage

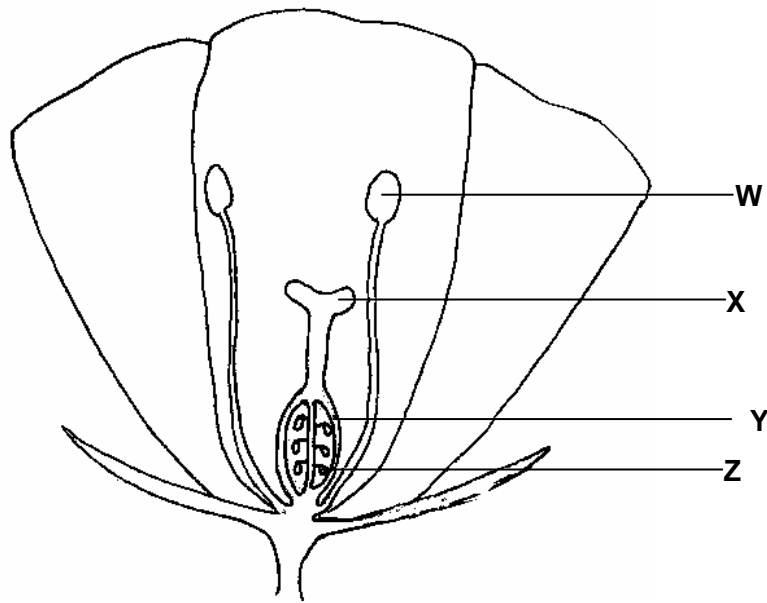
36 The graph shows how the pH of a lake has changed in the period 1500AD to 2000 AD.



What could have caused the change in the pH over the last 100 years?

- A burning of fossil fuels in factories
- B conversion of nearby woodlands to agricultural land
- C increased growth of plants in the lake
- D use of insecticides on nearby fields

37 The diagram represents a section through a flower.



What are the names of the labelled structures?

	W	X	Y	Z
A	anther	stigma	ovary	ovule
B	anther	stigma	ovule	ovary
C	stigma	anther	ovary	ovule
D	stigma	anther	ovule	ovary

38 In plant reproduction, the following processes occur.

- 1 fertilisation
- 2 growth of a pollen tube
- 3 pollination
- 4 seed germination

In which order do these processes take place?

- A 1 → 4 → 2 → 3
- B 2 → 1 → 3 → 4
- C 3 → 2 → 1 → 4
- D 4 → 3 → 1 → 2

39 A woman ovulates on the 7th March.
In which week will her next menstrual period begin?

	March						
week	Sun	Mon	Tues	Weds	Thurs	Fri	Sat
	-	-	-	1	2	3	4
A	5	6	7	8	9	10	11
B	12	13	14	15	16	17	18
C	19	20	21	22	23	24	25
D	26	27	28	29	30	31	

40 In mice, the allele for brown fur is dominant to the allele for grey fur.

What would be the phenotypes of a cross between a mouse heterozygous for brown fur and a mouse with grey fur?

- A** 100% with brown fur
- B** 100% with grey fur
- C** 75% with brown fur and 25% with grey fur
- D** 50% with brown fur and 50% with grey fur