

CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

**SCIENCE (CHEMISTRY, BIOLOGY)**

**5126/01**

Paper 1 Multiple Choice

October/November 2003

**1 hour**

Additional Materials: Multiple Choice Answer Sheet  
Soft clean eraser  
Soft pencil (type B or HB is recommended)

**READ THESE INSTRUCTIONS FIRST**

Write in soft pencil.

Do not use staples, paper clips, highlighters, glue or correction fluid.

Write your name, Centre number and candidate number on the answer sheet in the spaces provided unless this has 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 the instructions on the answer sheet very carefully.**

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

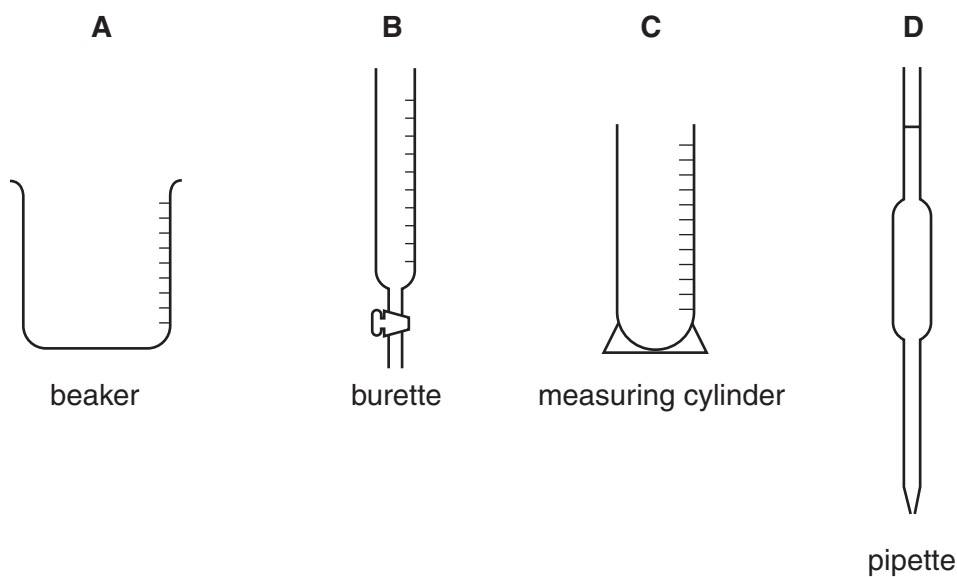
Any rough working should be done in this booklet.

A copy of the Periodic Table is included on page 20.

This document consists of **17** printed pages and **3** blank pages.



1 Which piece of apparatus is used to measure exactly  $22.5 \text{ cm}^3$  of a liquid?



2 What can be deduced from the symbol  ${}^4_2\text{He}$ ?

- A An atom of helium contains 2 electrons.
- B An atom of helium has 2 protons and 4 neutrons in its nucleus.
- C Helium has a proton (atomic) number of 4.
- D Helium occurs as a diatomic molecule.

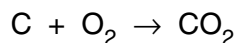
3 Substance **X** has the following properties

- 1 it conducts electricity when molten
- 2 it has a high melting point
- 3 it dissolves in an aqueous solution of hydrochloric acid

What is **X**?

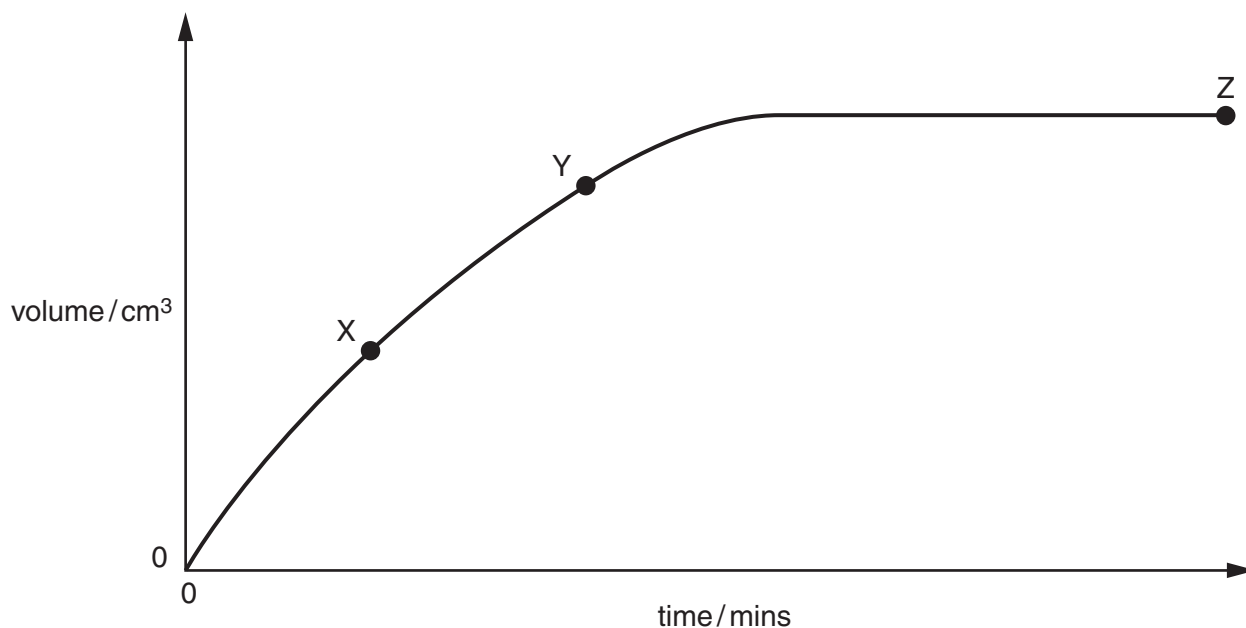
- A copper
- B ethanol
- C iodine
- D sodium chloride

- 4 A 6 g sample of pure carbon is completely burned in oxygen.



Which mass of carbon dioxide is produced?

- A 12 g  
 B 22 g  
 C 38 g  
 D 44 g
- 5 The formula of copper(I) oxide is  $\text{Cu}_2\text{O}$ .  
 How many grams of oxygen are combined with 64 g of copper in this compound?  
 A 8      B 16      C 32      D 64
- 6 The graph shows the total volume of carbon dioxide evolved, plotted against time, when excess calcium carbonate reacts with  $20 \text{ cm}^3$  of hydrochloric acid containing  $2 \text{ mol/dm}^3$ .



Which statement is correct?

- A The reaction is faster at point Y than at point X.  
 B The reaction first reaches completion at point Z.  
 C The time taken to reach completion decreases if  $20 \text{ cm}^3$  of hydrochloric acid containing  $4 \text{ mol/dm}^3$  is used.  
 D The total volume of carbon dioxide evolved is greater if a greater mass of calcium carbonate is used.

- 7 Which word describes the reaction between hydrochloric acid and sodium hydroxide?
- A electrolysis
  - B neutralisation
  - C precipitation
  - D thermal decomposition

- 8 Four aqueous solutions have the pH values shown in the table.

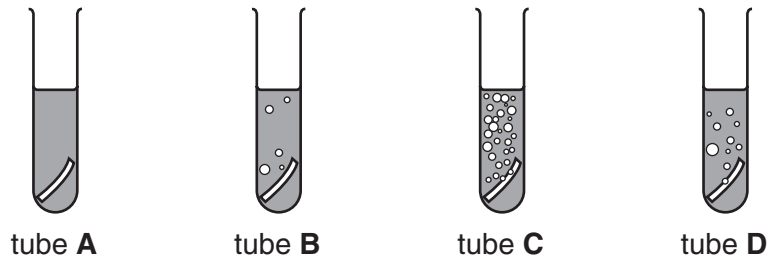
solution	P	Q	R	S
pH	2	6	8	10

If pairs of solutions are mixed, which pair **must** produce an acidic mixture?

- A P and Q      B P and R      C P and S      D Q and R
- 9 Which two substances react to form a salt and water only?
- A dilute ethanoic acid and aqueous sodium hydroxide
  - B dilute hydrochloric acid and zinc
  - C dilute sulphuric acid and aqueous sodium carbonate
  - D aqueous silver nitrate and aqueous sodium chloride
- 10 Which arrangement of electrons is that of a gas normally used to fill light bulbs?
- A 2      B 2, 6      C 2, 8, 2      D 2, 8, 8
- 11 What is used to decide the order of the elements in the Periodic Table?
- A density
  - B number of neutrons
  - C number of protons
  - D relative atomic mass

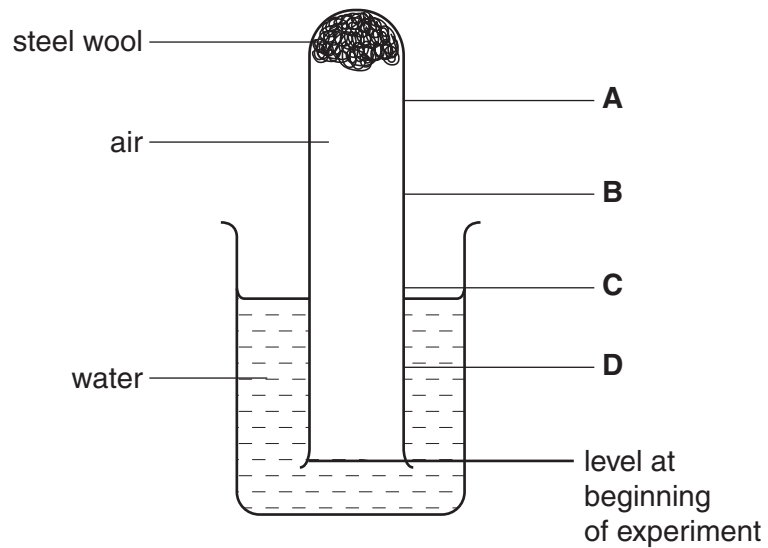
12 The metals iron, lead, magnesium and zinc are each added to dilute hydrochloric acid.

Which tube contains magnesium and dilute hydrochloric acid?



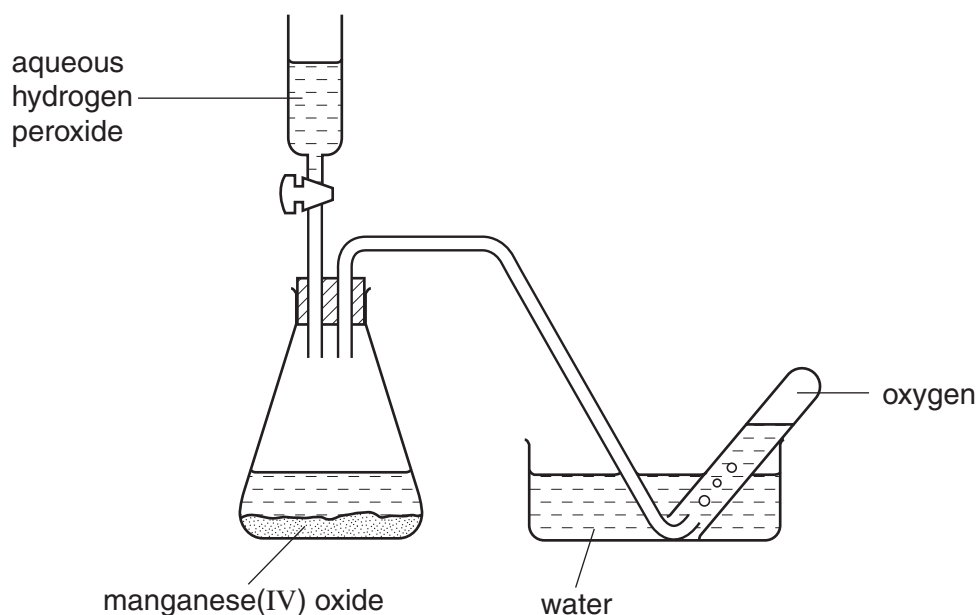
13 The diagram shows steel wool inside a test-tube. The test-tube is inverted in water, trapping air inside.

What will be the water level after several days?



- 14 Using manganese(IV) oxide as a catalyst, aqueous hydrogen peroxide decomposes to form oxygen.

This reaction was used to make and collect oxygen as shown in the diagram.



The first few test-tubes of collected gas should be rejected because the oxygen would be contaminated by

- A air.
  - B hydrogen.
  - C hydrogen peroxide.
  - D manganese(IV) oxide.
- 15 A sample of polluted air is bubbled through water.

The pH of the solution formed is less than 7.

Which gas causes this?

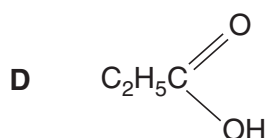
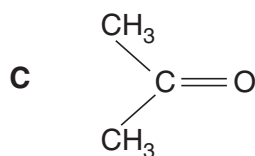
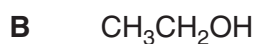
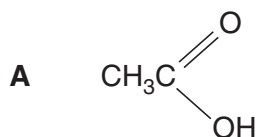
- A ammonia
- B carbon monoxide
- C nitrogen
- D sulphur dioxide

16 When crude oil is distilled, several products are obtained.

What is the correct order of their boiling points?

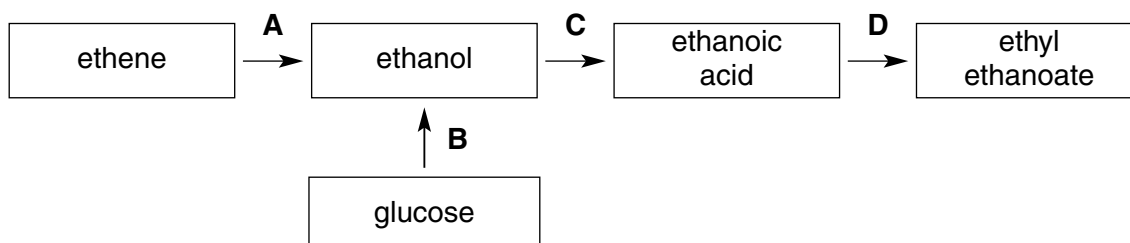
	lowest boiling point $\longrightarrow$			highest boiling point
<b>A</b>	diesel	paraffin	petrol	lubricating oil
<b>B</b>	paraffin	petrol	lubricating oil	diesel
<b>C</b>	petrol	paraffin	diesel	lubricating oil
<b>D</b>	petrol	diesel	lubricating oil	paraffin

17 Wine can deteriorate after a period of time, because of atmospheric oxidation. Which compound would be formed by the oxidation of the alcohol in the wine?

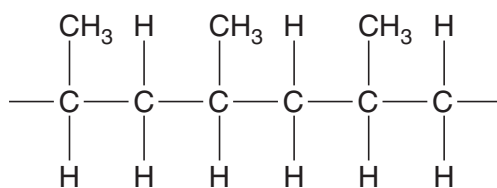


18 The diagram shows changes to some organic compounds.

In which change is an ester formed?

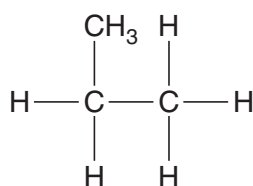


19 The structure of a polymer is shown

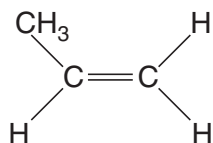


From which hydrocarbon is the polymer made?

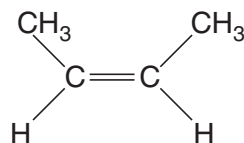
**A**



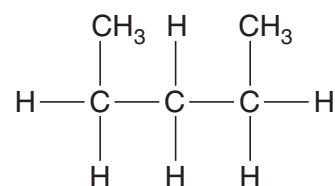
**B**



**C**



**D**



20 In which pair of polymers are the linkages the same?

- A** fats and proteins
- B** nylon and fats
- C** nylon and proteins
- D** proteins and *Terylene*



21 Which structures are present in animal cells?

	cell membrane	cell wall	cytoplasm
<b>A</b>	x	✓	✓
<b>B</b>	✓	x	✓
<b>C</b>	✓	✓	x
<b>D</b>	✓	✓	✓

key

✓ = structure present  
x = structure absent

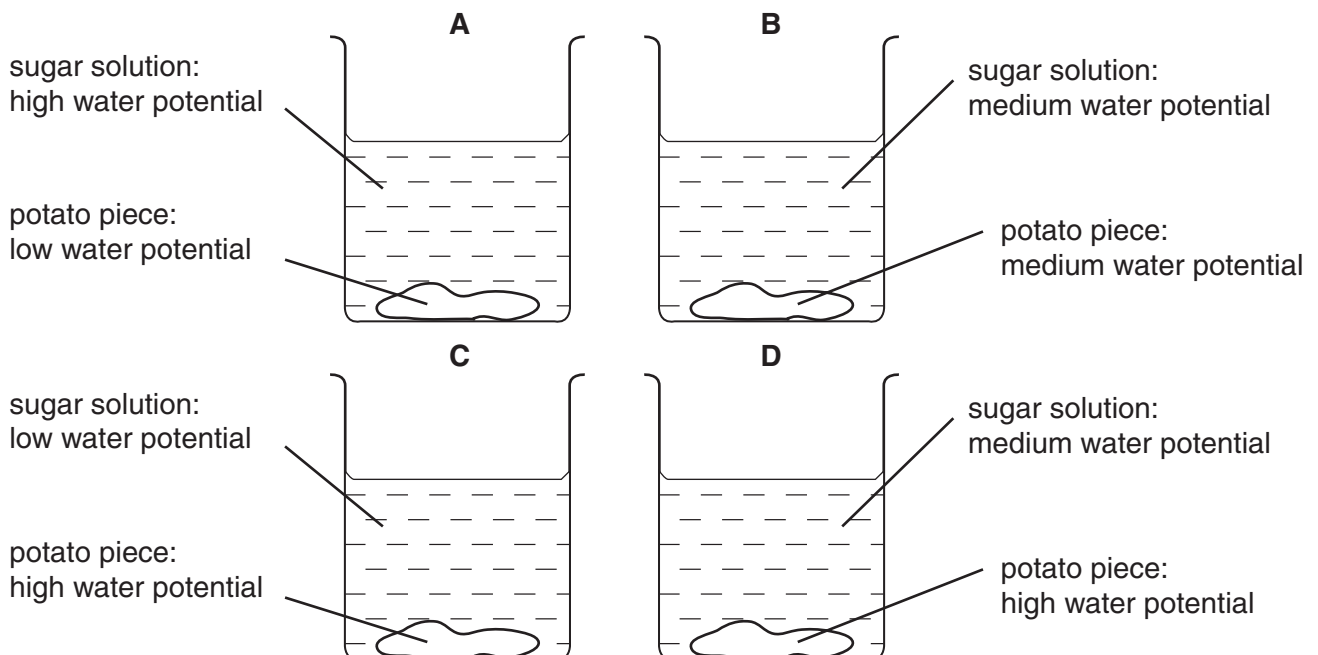
22 The table shows the main functions of red blood cells and root hair cells.

Which row is correct?

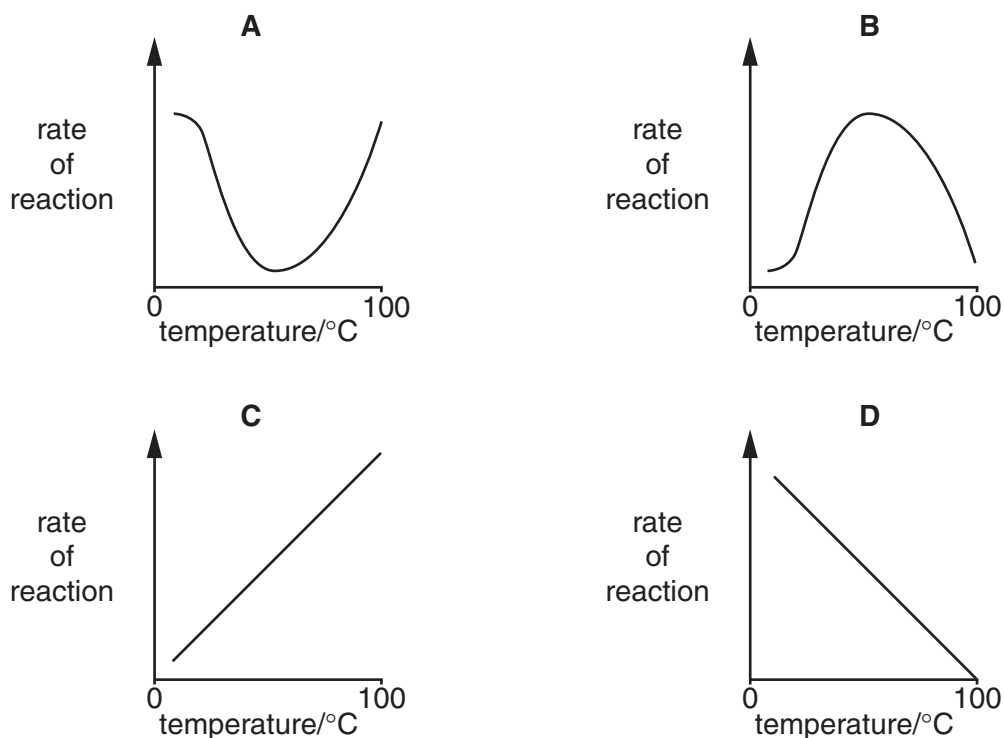
	red blood cell	root hair cell
<b>A</b>	absorption	absorption
<b>B</b>	absorption	transport
<b>C</b>	transport	absorption
<b>D</b>	transport	transport

23 The diagrams show some pieces of potato in four sugar solutions of different water potential.

In which solution will the potato piece take up water from the solution and swell?

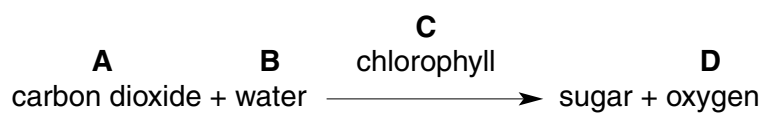


24 Which graph shows the effect of temperature on an enzyme-controlled reaction?



25 The word equation represents the overall chemical reactions of photosynthesis.

Which labelled substance traps light energy?



26 Which substances do plants make using nitrate ions?

	proteins	starch	sugar
<b>A</b>	✓	x	x
<b>B</b>	✓	✓	x
<b>C</b>	x	✓	✓
<b>D</b>	x	x	✓

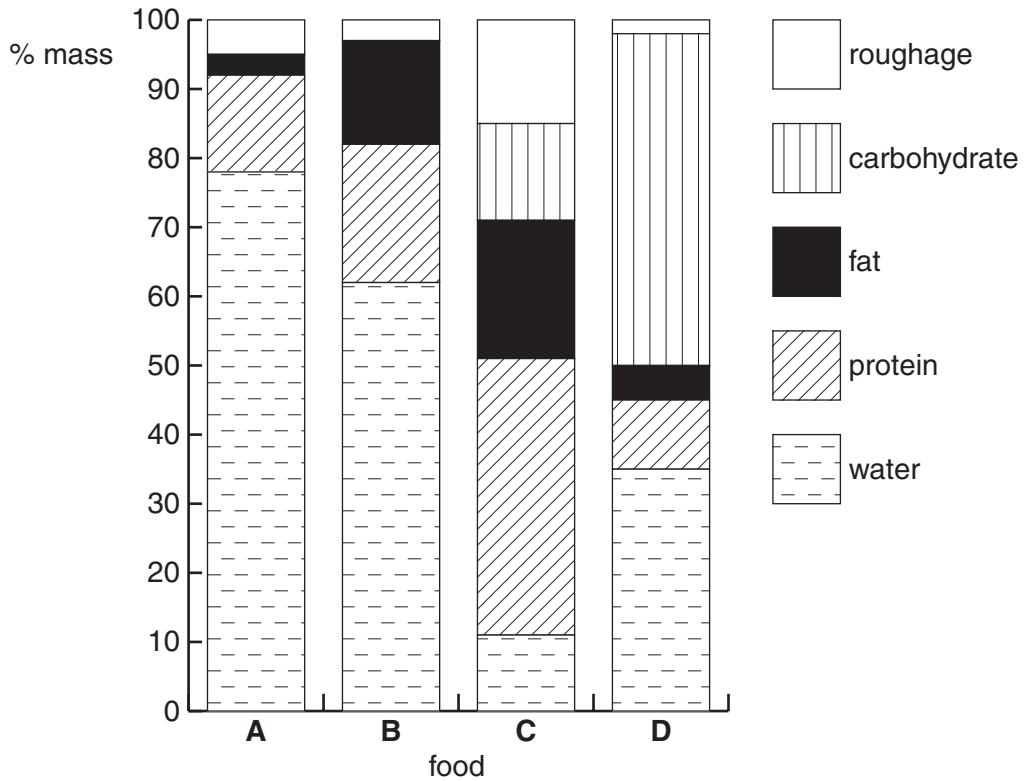
key

✓ = nitrate used

x = nitrate not used

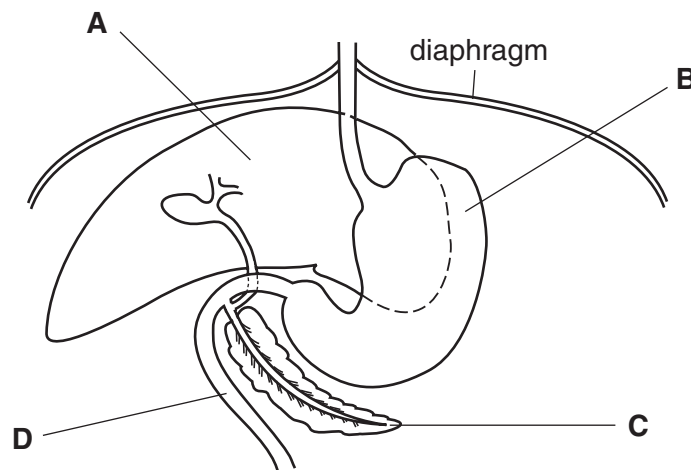
27 The diagram shows the results of analysing four foods.

Which food will provide the most energy per gram?



28 The diagram shows part of the human digestive system.

Which part secretes an acidic digestive juice containing a protease?



29 A plant stem was dissected into a number of different tissues. Each tissue was tested for the presence of starch, protein and reducing sugar. The results are shown in the table.

Which tissue is xylem?

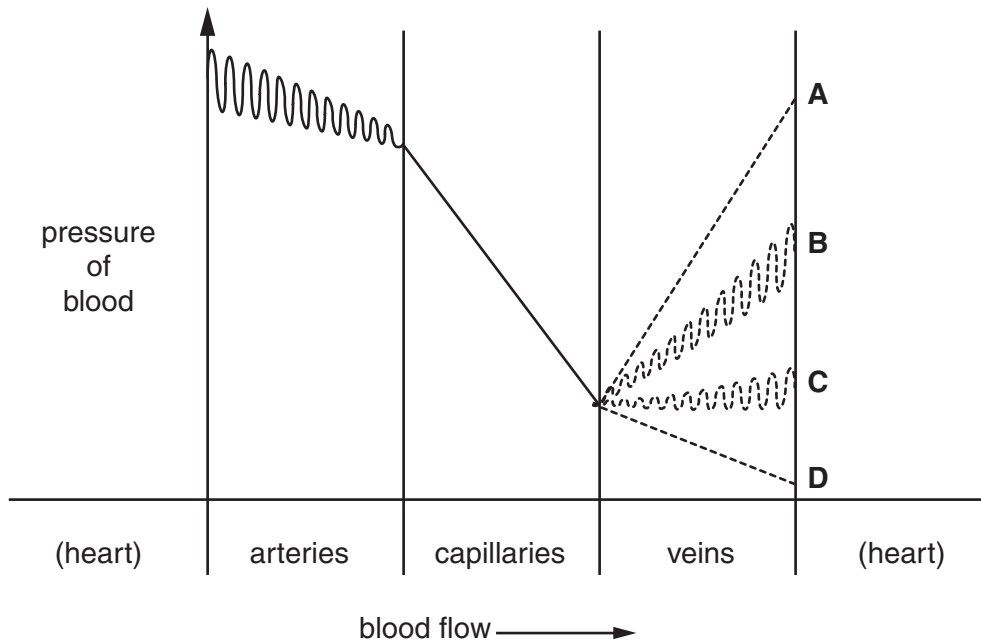
	starch	protein	sugar
<b>A</b>	✓	x	✓
<b>B</b>	✓	x	x
<b>C</b>	x	✓	✓
<b>D</b>	x	x	x

key

✓ = substance present  
x = substance absent

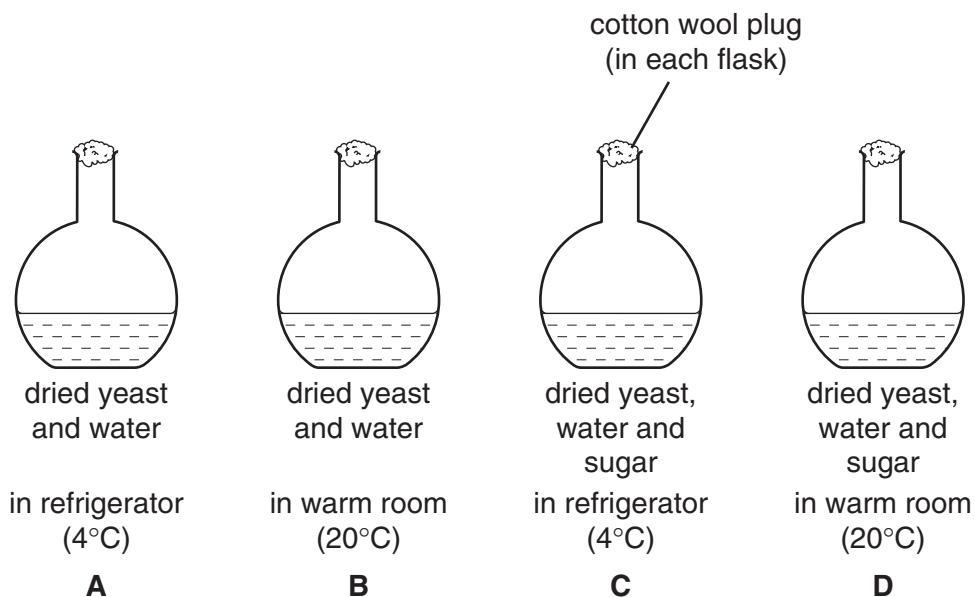
30 The diagram shows the pressure of blood after it leaves the heart and passes through arteries and then capillaries.

Which dotted line shows the pressure of blood as it flows through veins before returning to the heart?

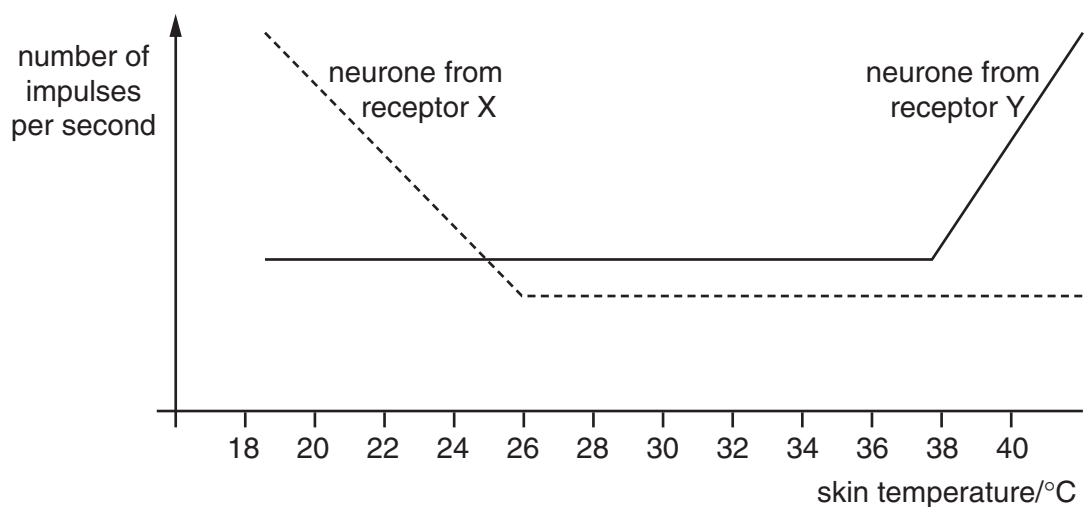


31 Four flasks were sterilised and set up as shown in the diagram.

Which flask will show signs of fermentation (anaerobic respiration) after one hour?



32 The graph shows the number of nerve messages (impulses) per second travelling along two sensory neurones from the skin to the brain, at different skin temperatures.



What does the graph show?

- A Receptor X responds most strongly to temperatures above 26 °C.
- B Receptor Y responds most strongly to temperatures below 26 °C.
- C Receptors X and Y respond most strongly between 26 °C and 38 °C.
- D Receptors X and Y respond most strongly outside the temperature range of 26 °C to 38 °C.

33 Which substances are depressant drugs?

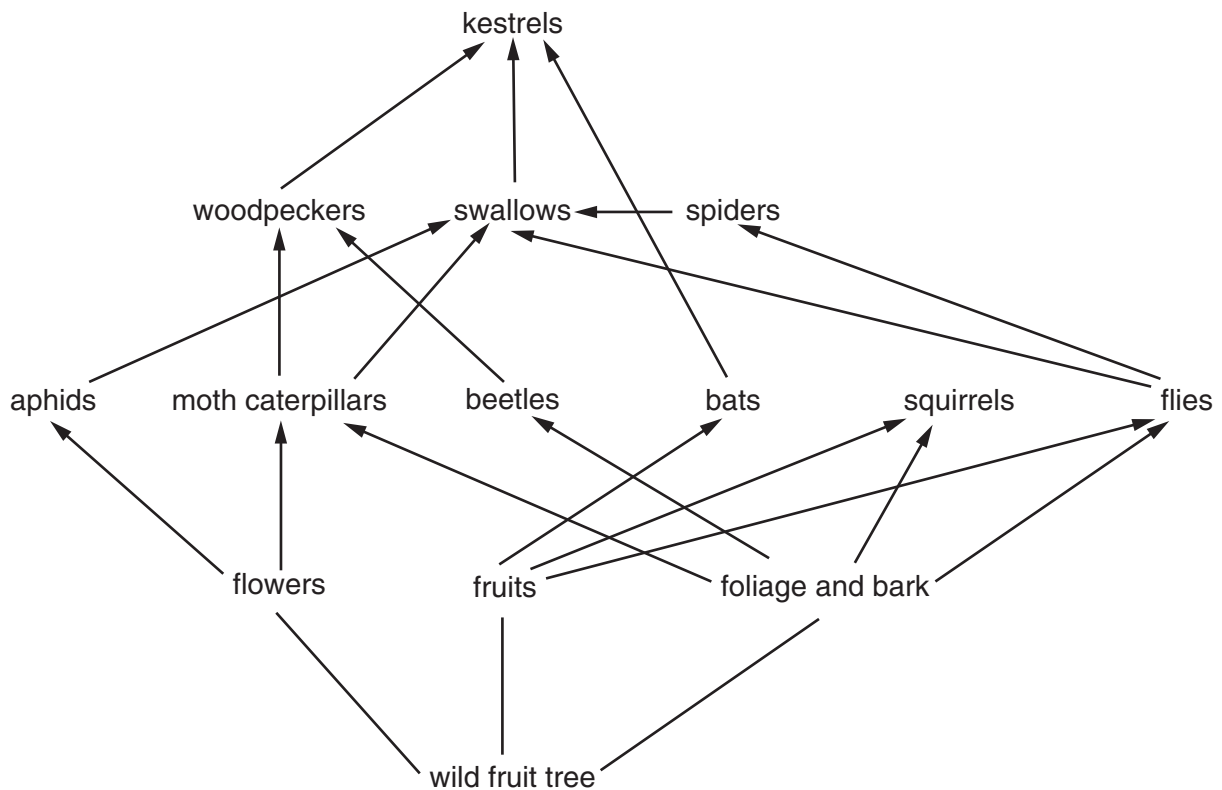
	alcohol	heroin	penicillin
<b>A</b>	✓	✓	✓
<b>B</b>	✓	✓	x
<b>C</b>	✓	x	✓
<b>D</b>	x	✓	✓

key

✓ = depressant

x = not a depressant

34 The diagram shows a food web on a wild fruit tree.



Which animals would be most affected, if the flowers of the tree were **not** pollinated?

- A aphids
- B bats
- C kestrels
- D squirrels

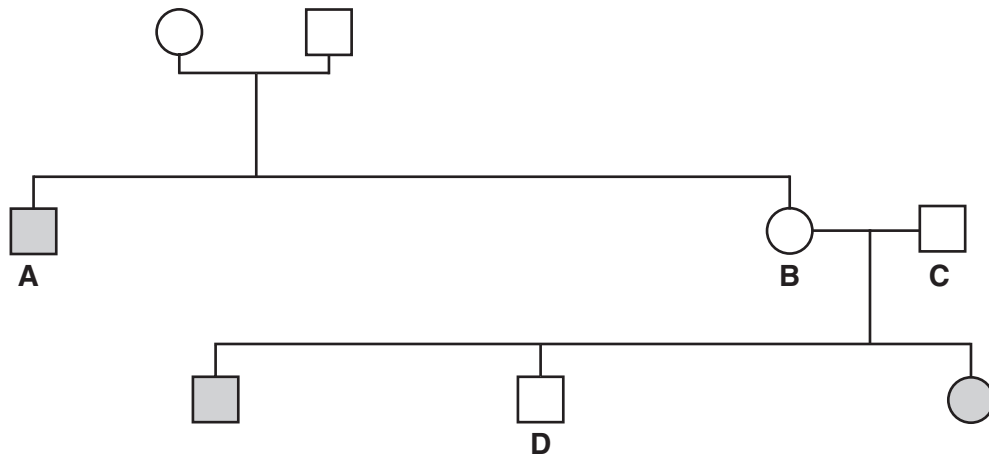
35 When does an ecosystem such as a tropical rainforest absorb or release carbon dioxide?




	in daylight	in darkness
<b>A</b>	absorbs	absorbs
<b>B</b>	absorbs	releases
<b>C</b>	releases	absorbs
<b>D</b>	releases	releases

- 36 In recent years, important rivers in many parts of the world have become more acidic.  
What has caused this change?
- A air pollution by sulphur dioxide
  - B heavy metals
  - C increased use of insecticides
  - D increased use of nitrate fertilisers
- 37 Which of these effects of Man on the ecosystem is reduced by proper treatment of sewage?
- A acid rain
  - B death of fish due to lack of oxygen
  - C increase of carbon dioxide in the atmosphere
  - D lack of soil minerals
- 38 Which structures protect the flower when it is a bud?
- A anthers
  - B carpels
  - C petals
  - D sepals
- 39 What is happening when gametes are released by the human female?
- A fertilisation
  - B implantation
  - C menstruation
  - D ovulation

40 The diagram shows a family tree in which some members have sickle cell anaemia.

Which person could have two alleles for sickle cell anaemia?



- male with sickle cell anaemia 
- female with sickle cell anaemia 
- male free of the disease 
- female free of the disease 