UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

SCIENCE (CHEMISTRY, BIOLOGY) **5126/01**

Paper 1 Multiple Choice **October/November 2008**

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 on this paper. Answer **all** questions. For each question there are four possible answers **A**, **B**, **C** and **D**.
Choose the **one** you consider 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 printed on page 16.

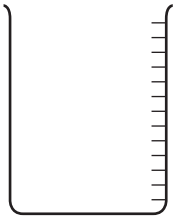
IB08 11_5126_01/2RP

UNIVERSITY of CAMBRIDGE
International Examinations

[Turn over

1 Which piece of apparatus is used to measure **exactly** 22.5 cm^3 of a liquid?

A

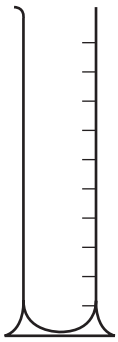


beaker

B

burette

C



measuring cylinder

D

pipette

2 An atom of element X is represented by $^{7}_{3}X$.

Which statement about this atom of X is correct?

A It is in Group III of the Periodic Table.

B It is in Group VII of the Periodic Table.

C The total number of protons and electrons is 6.

D The total number of protons and neutrons is 10.

3 Element Q has 2 outer shell electrons in its atoms.

Element R has 7 outer shell electrons in its atoms.

Which ions will be present in the compound formed when Q and R react?

A Q^+ and R^- **B** Q^{2+} and R^- **C** Q^- and R^+ **D** Q^{2-} and R^+

4 The outer electronic structure of compound **J** is shown.

Y and **Z** are different elements.

compound **J**

Which formula could represent compound **J**?

A $CℓO$ **B** CO_2 **C** H_2O **D** SiO_2

5 The formula of an oxide of uranium is UO_2.

What is the formula of the corresponding chloride?

A UCl_2 **B** UCl_4 **C** U_2Cl **D** U_4Cl

6 Which process is exothermic?

A burning petrol in a car engine

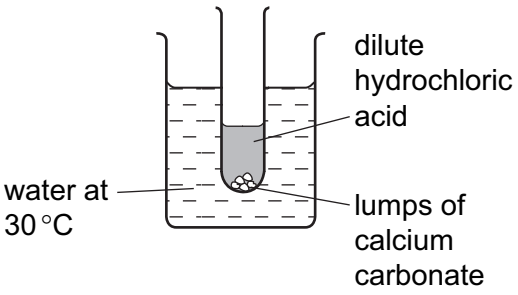
B cracking of oil fractions

C fractional distillation of oil

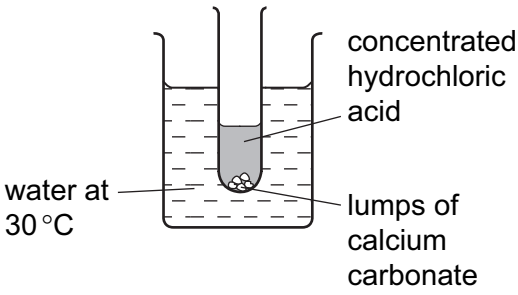
D melting bitumen for roads

7 Which reaction is the fastest?

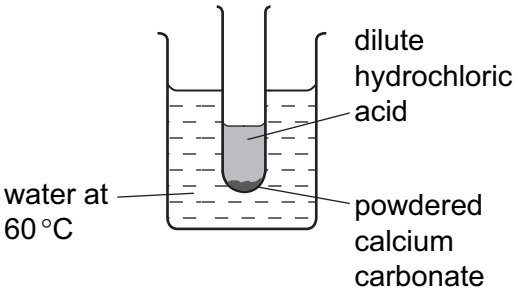
A



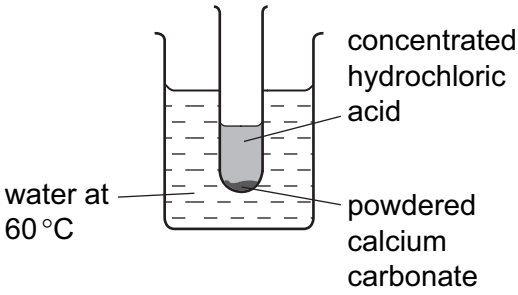
B



C



D



8 Aluminium chloride dissolves in water to form a solution with a pH less than 7.

Which ion in the solution makes the solution have a pH less than 7?

A aluminium

B chloride

C hydrogen

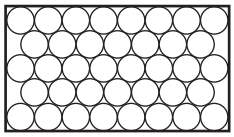
D hydroxide

9 Which arrangement of electrons is that of a gas normally used to fill light bulbs?

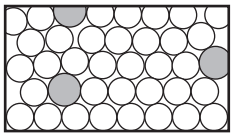
A 2 **B** 2, 6 **C** 2, 8, 2 **D** 2, 8, 8

10 Which diagram represents the structure of an alloy?

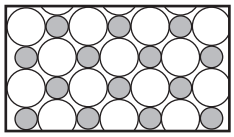
A



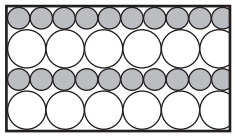
B



C



D



11 The metals iron, lead and zinc can be manufactured by the reduction of their oxides with coke.

What is the correct order of the ease of reduction of the metal oxides?

	oxides becoming more difficult to reduce $\longrightarrow$
A	iron → lead → zinc
B	iron → zinc → lead
C	lead → iron → zinc
D	zinc → iron → lead

12 Which reaction occurring in the blast furnace is an acid base reaction?

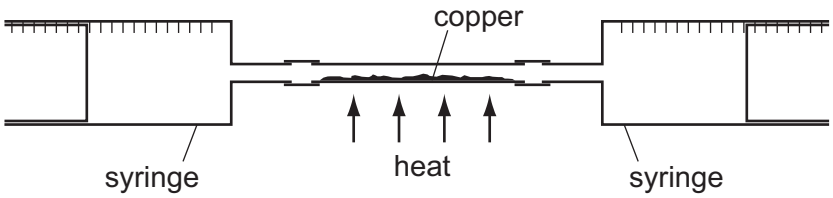
A $C + CO_2 \rightarrow 2CO$

B $C + O_2 \rightarrow CO_2$

C $CaCO_3 + SiO_2 \rightarrow CaSiO_3 + CO_2$

D $Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$

13 In the apparatus shown, 100 cm^3 of air are passed backwards and forwards between the two syringes until reaction is complete.



What is the final volume of gas after cooling to the original temperature?

A 20 cm^3 **B** 28 cm^3 **C** 32 cm^3 **D** 80 cm^3

14 A gas **X**

1 has no smell;

2 is not poisonous;

3 reacts with hydrogen under certain conditions.

What is gas **X**?

A carbon monoxide

B helium

C nitrogen

D chlorine

15 Which products are formed when limestone is heated?

A lime and carbon dioxide only

B lime and water only

C lime, carbon dioxide and water

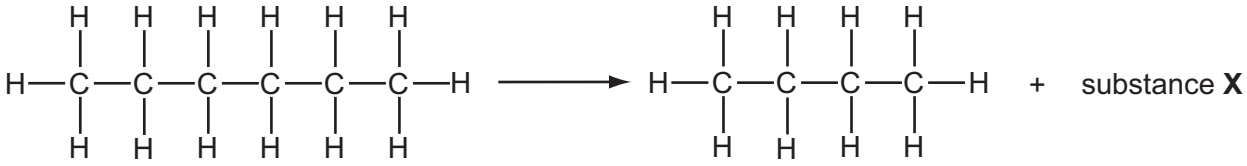
D slaked lime and carbon dioxide

16 The table shows the names of four fractions from petroleum and their uses.

Which fraction is paired correctly with its use?

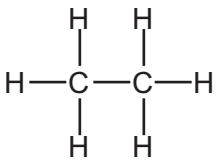
	fraction	use
A	lubricating oil	source of polishes and waxes
B	kerosene	lubricant
C	diesel	making road surfaces
D	gasoline	feedstock for the chemical industry

17 The equation shows a molecule of hexane being cracked into two smaller molecules by heating to a high temperature.



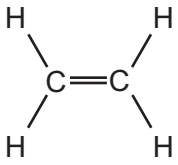
What is likely to be the structure of substance **X**?

A

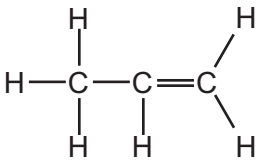


B

C



D



18 Which substance is used to distinguish between samples of ethane and ethene?

A aqueous barium chloride

B aqueous bromine

C lime water

D litmus solution

19 Yeast is used to convert simple sugars to

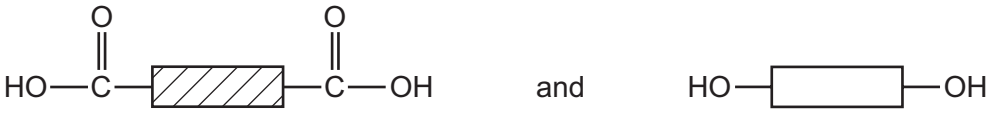
A ethanoic acid and oxygen.

B ethanol and carbon dioxide.

C ethanol and oxygen.

D starch and carbon dioxide.

20 A macromolecule is made from these two monomer molecules.



What is the macromolecule?

A a carbohydrate

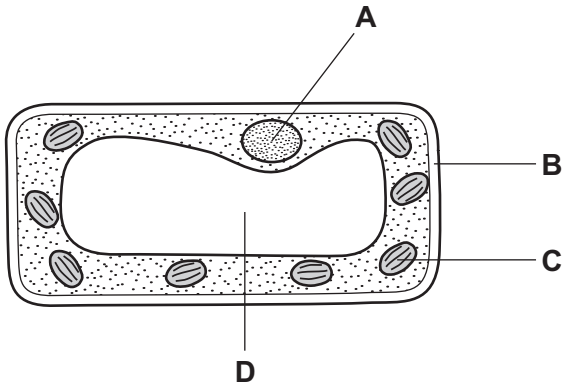
B a polyamide

C a polyester

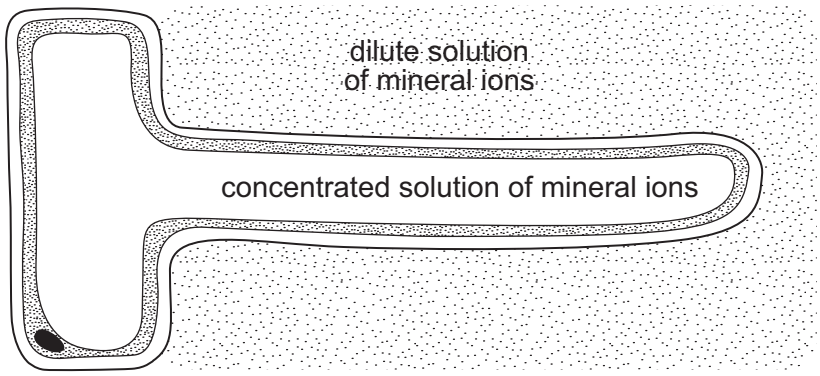
D a protein

21 A plant is grown in bright sunshine. After a few hours, a leaf from this plant is stained with iodine solution. The diagram shows what is seen when a cell from this leaf is placed under a microscope.

Which structure will be stained blue / black?



22 The diagram shows a root hair, surrounded by a dilute solution of mineral ions.



Which statement describes what happens?

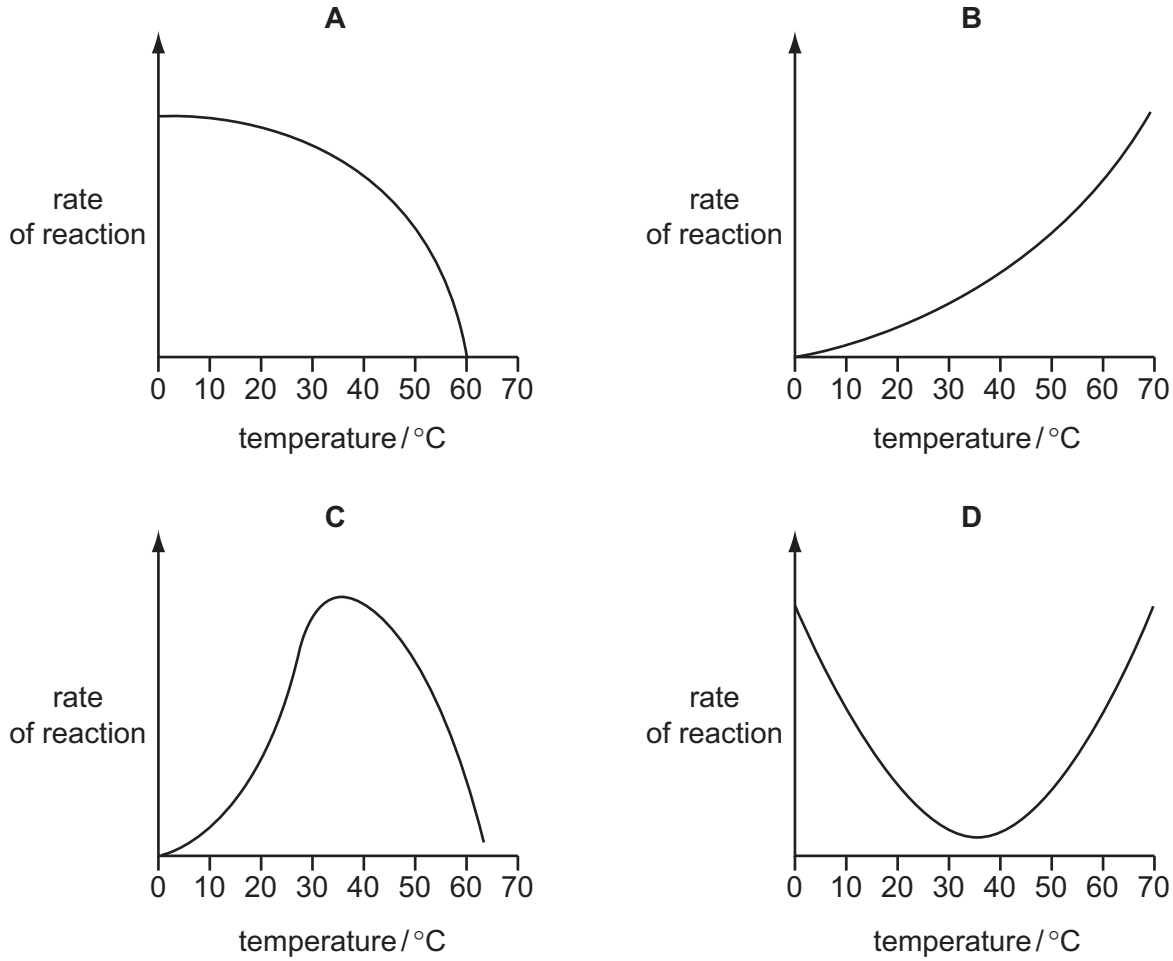
A Water molecules move into the root hair because their concentration is lower inside.

B Water molecules move into the root hair because their concentration is lower outside.

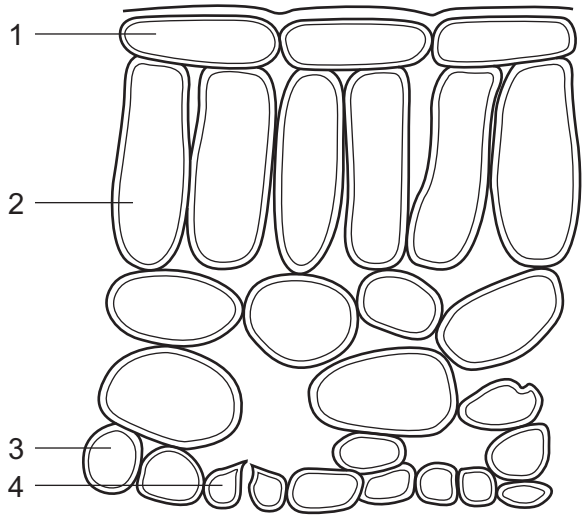
C Water molecules move out of the root hair because their concentration is lower inside.

D Water molecules move out of the root hair because their concentration is lower outside.

23 Which graph shows how an enzyme catalysed reaction in the alimentary canal varies with temperature?



24 The diagram shows the arrangement of cells inside the leaf of a green plant.
(No cell contents are shown.)



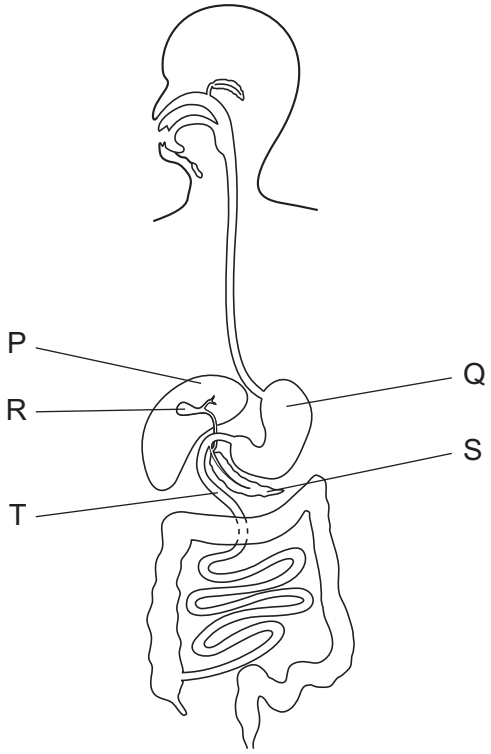
Which cells normally contain chloroplasts?

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

25 Where is amylase secreted in the digestive system, and what is its end product?

	secreted from	end product
A	pancreas and salivary glands	glucose
B	pancreas and salivary glands	maltose
C	stomach and small intestine	glucose
D	stomach and small intestine	maltose

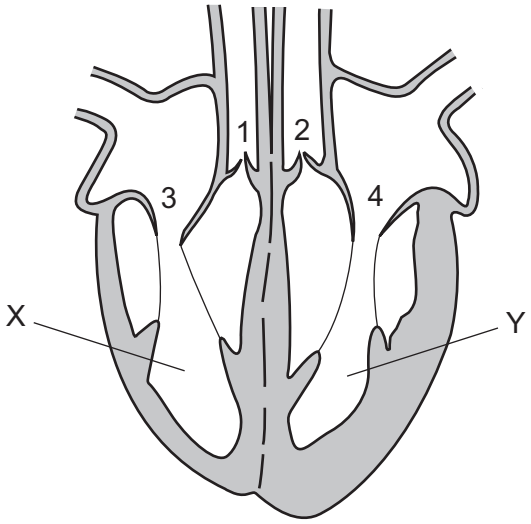
26 The diagram shows the human gut.



Where is bile made, where is it stored and where does it act?

	where it is made	where it is stored	where it acts
A	P	Q	R
B	P	R	T
C	Q	S	P
D	Q	T	S

27 The diagram shows a section through the heart.



While chambers X and Y are emptying, which valves are open and which are closed?

	valves 1 and 2	valves 3 and 4
A	closed	closed
B	closed	open
C	open	closed
D	open	open

28 The amount of oxygen carried by human blood depends on the

A amount of plasma.

B number of platelets.

C number of red blood cells.

D number of white blood cells.

29 What are the products of aerobic and anaerobic respiration in muscle tissue?

	aerobic respiration	anaerobic respiration
A	carbon dioxide and water	ethanol
B	carbon dioxide and water	lactic acid
C	ethanol	carbon dioxide and water
D	lactic acid	carbon dioxide and water

30 Which process does **not** result in an overall loss of energy from the organism?

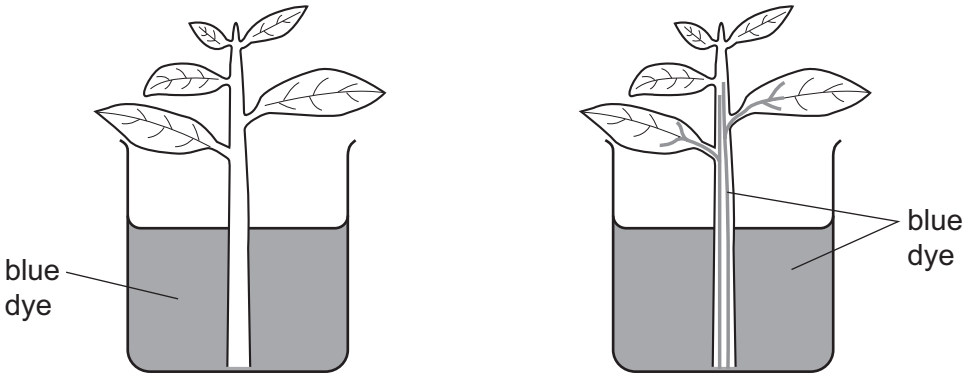
A a boy running one hundred metres

B photosynthesis in a green plant

C respiration in an animal

D the germination of seeds

31 A piece of a plant with a transparent stem was placed in a beaker containing a blue dye and then examined 5 hours later.



Which statement explains the change in appearance?

A Blue dye diffuses through the cells of the plant.

B Blue dye diffuses up the stem by osmosis.

C Blue dye moves up through the phloem.

D Blue dye moves up through the xylem.

32 Which organ excretes most carbon dioxide from the human body?

A kidney

B lung

C rectum

D skin

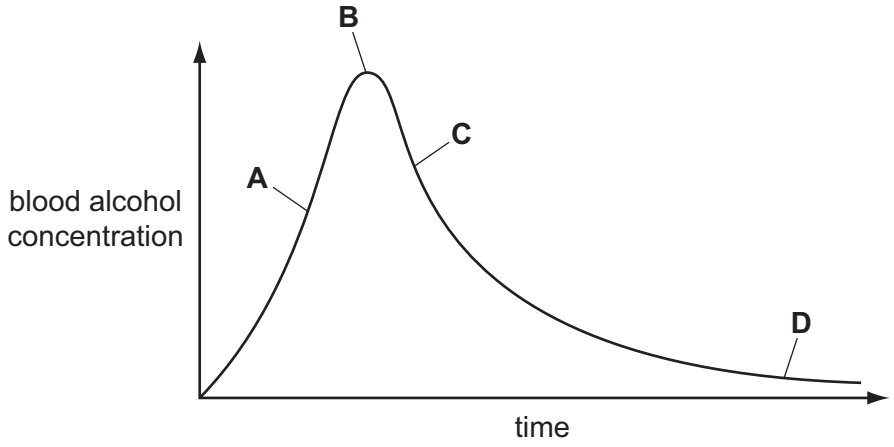
33 What happens in the eye when a person walks from a dark room into sunlight?

	radial muscles of the iris	circular muscles of the iris	pupil size
A	contract	relax	decreases
B	contract	relax	increases
C	relax	contract	decreases
D	relax	contract	increases

34 Samples of blood are taken every half hour from a person who has been drinking alcohol.

The graph shows the amount of alcohol in the person's blood.

During which period is alcohol removed fastest from the blood?



35 What happens to energy after it has flowed through a food chain?

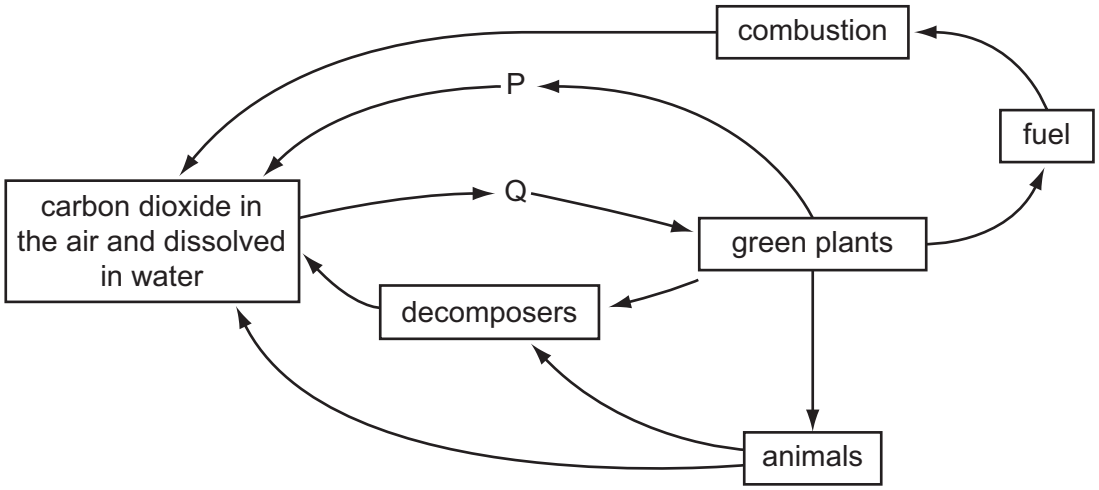
A It is lost as heat.

B It is recycled.

C It is stored as carbohydrate.

D It is used to power metabolic processes.

36 The diagram shows the carbon cycle.



What are processes P and Q?

	P	Q
A	photosynthesis	photosynthesis
B	respiration	respiration
C	photosynthesis	respiration
D	respiration	photosynthesis

37 Which property of modern insecticides helps to keep environmental pollution at the **lowest** level?

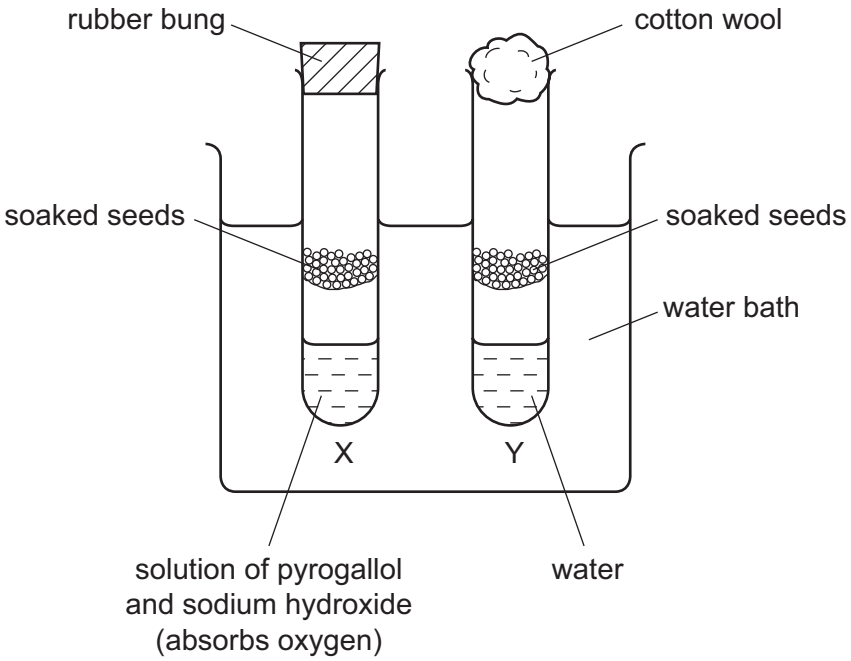
A They accumulate in the bodies of predators.

B They are broken down by soil bacteria.

C They are easily washed into lakes and rivers.

D They are taken up by plant roots.

38 The diagram shows an experiment to find out if seeds need oxygen to germinate.



Which change should be made for tube Y to be an effective control?

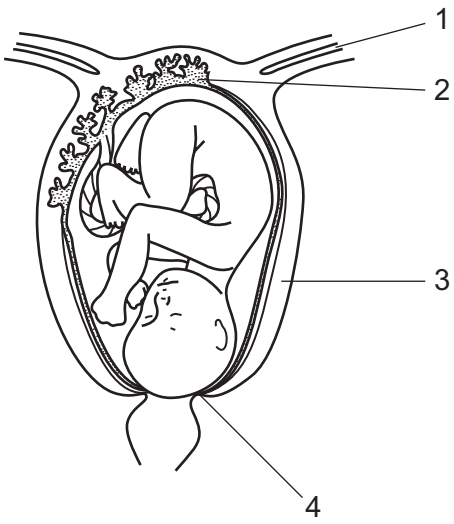
A Add soda lime at the bottom of tube Y.

B Do not soak the seeds in tube Y.

C Replace the cotton wool in tube Y with a rubber bung.

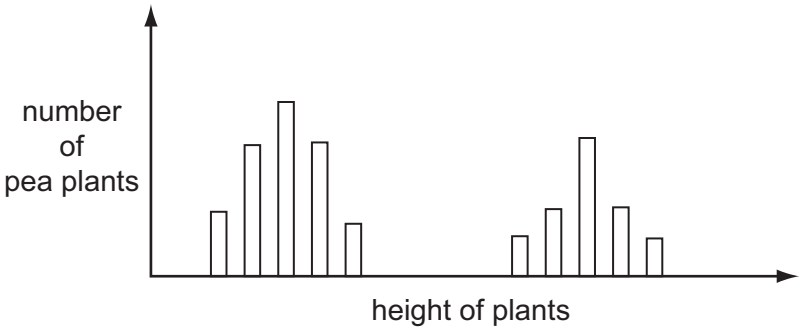
D Replace the soaked seeds in tube Y with seeds that have been boiled.

39 Where are the uterus and the cervix?



	uterus	cervix
A	1	2
B	2	1
C	3	4
D	4	3

40 The bar chart shows the heights of pea plants grown from 500 pea seeds.



What variation do the plants show?

A continuous variation only

B discontinuous variation only

C both continuous variation and discontinuous variation

D neither continuous variation nor discontinuous variation

DATA SHEET
The Periodic Table of the Elements

	Group																	
	I	II									III	IV	V	VI	VII	0
																4 **He** Helium 2
						1 **H** Hydrogen 1										
	7 **Li** Lithium 3	9 **Be** Beryllium 4									11 **B** Boron 5	12 **C** Carbon 6	14 **N** Nitrogen 7	16 **O** Oxygen 8	19 **F** Fluorine 9	20 **Ne** Neon 10
	23 **Na** Sodium 11	24 **Mg** Magnesium 12									27 **Al** Aluminium 13	28 **Si** Silicon 14	31 **P** Phosphorus 15	32 **S** Sulphur 16	35.5 **Cl** Chlorine 17	40 **Ar** Argon 18
	39 **K** Potassium 19	40 **Ca** Calcium 20	45 **Sc** Scandium 21	48 **Ti** Titanium 22	51 **V** Vanadium 23	52 **Cr** Chromium 24	55 **Mn** Manganese 25	56 **Fe** Iron 26	59 **Co** Cobalt 27	59 **Ni** Nickel 28	64 **Cu** Copper 29	65 **Zn** Zinc 30	70 **Ga** Gallium 31	73 **Ge** Germanium 32	75 **As** Arsenic 33	79 **Se** Selenium 34	80 **Br** Bromine 35	84 **Kr** Krypton 36
	85 **Rb** Rubidium 37	88 **Sr** Strontium 38	89 **Y** Yttrium 39	91 **Zr** Zirconium 40	93 **Nb** Niobium 41	96 **Mo** Molybdenum 42	**Tc** Technetium 43	101 **Ru** Ruthenium 44	103 **Rh** Rhodium 45	106 **Pd** Palladium 46	108 **Ag** Silver 47	112 **Cd** Cadmium 48	115 **In** Indium 49	119 **Sn** Tin 50	122 **Sb** Antimony 51	128 **Te** Tellurium 52	127 **I** Iodine 53	131 **Xe** Xenon 54
	133 **Cs** Caesium 55	137 **Ba** Barium 56	139 **La** Lanthanum 57 *	178 **Hf** Hafnium 72	181 **Ta** Tantalum 73	184 **W** Tungsten 74	186 **Re** Rhenium 75	190 **Os** Osmium 76	192 **Ir** Iridium 77	195 **Pt** Platinum 78	197 **Au** Gold 79	201 **Hg** Mercury 80	204 **Tl** Thallium 81	207 **Pb** Lead 82	209 **Bi** Bismuth 83	**Po** Polonium 84	**At** Astatine 85	**Rn** Radon 86
	Fr Francium 87	226 **Ra** Radium 88	227 **Ac** Actinium 89 †															

*58-71 Lanthanoid series	140 **Ce** Cerium 58	141 **Pr** Praseodymium 59	144 **Nd** Neodymium 60	**Pm** Promethium 61	150 **Sm** Samarium 62	152 **Eu** Europium 63	157 **Gd** Gadolinium 64	159 **Tb** Terbium 65	162 **Dy** Dysprosium 66	165 **Ho** Holmium 67	167 **Er** Erbium 68	169 **Tm** Thulium 69	173 **Yb** Ytterbium 70	175 **Lu** Lutetium 71
†90-103 Actinoid series	232 **Th** Thorium 90	**Pa** Protactinium 91	238 **U** Uranium 92	**Np** Neptunium 93	**Pu** Plutonium 94	**Am** Americium 95	**Cm** Curium 96	**Bk** Berkelium 97	**Cf** Californium 98	**Es** Einsteinium 99	**Fm** Fermium 100	**Md** Mendelevium 101	**No** Nobelium 102	**Lr** Lawrencium 103

Key: a = relative atomic mass; X = atomic symbol; b = proton (atomic) number

The volume of one mole of any gas is 24 dm^3 at room temperature and pressure (r.t.p.).