



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

**COMBINED SCIENCE**

**5129/01**

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.

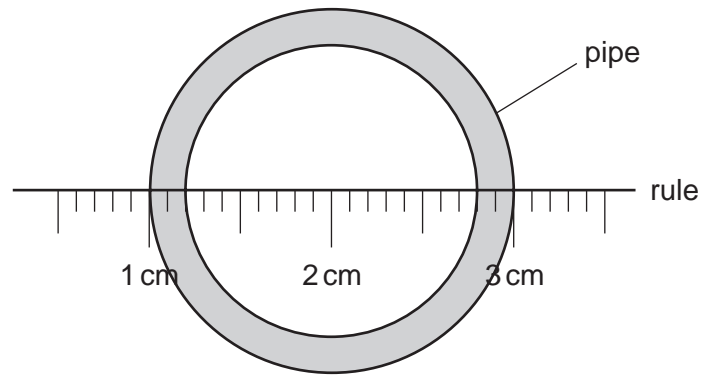
Any rough working should be done in this booklet.

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

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

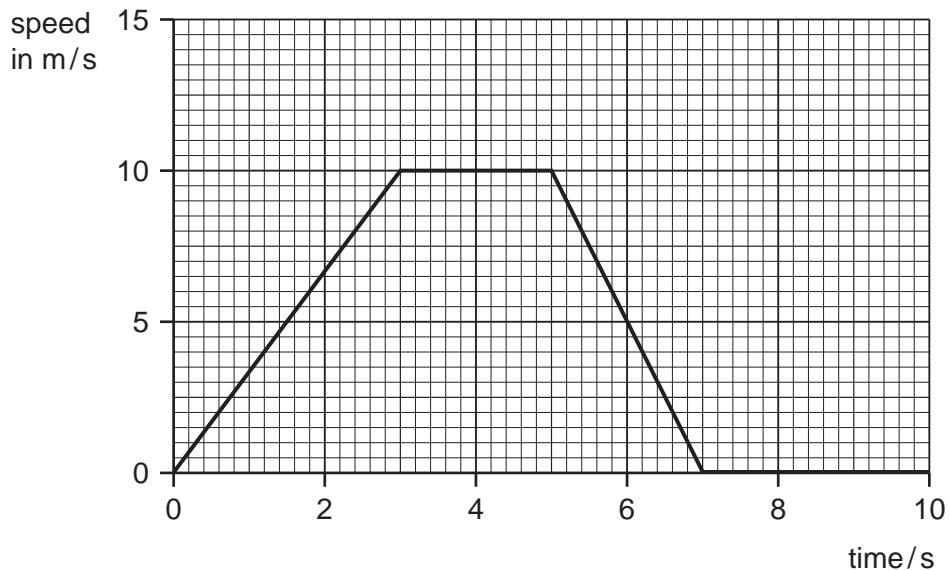


- 1 A rule is used to measure the internal diameter of a pipe.



What is the internal diameter of the pipe?

- A** 1.6 cm      **B** 1.8 cm      **C** 2.0 cm      **D** 2.6 cm
- 2 The graph shows the speed of a car over the first ten seconds of a journey.



Which statement about the acceleration of the car between 3 s and 5 s is true?

- A** The acceleration decreases.  
**B** The acceleration increases.  
**C** The acceleration is zero.  
**D** The acceleration is 10 m/s.
- 3 A container is filled with 5 kg of paint. The density of the paint is 2 g/cm<sup>3</sup>.

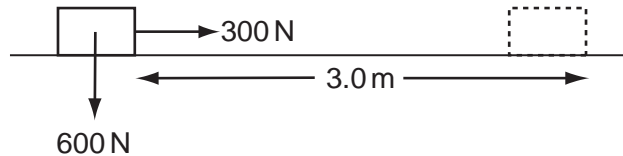
Which volume of container is needed?

- A** 10 cm<sup>3</sup>      **B** 400 cm<sup>3</sup>      **C** 2500 cm<sup>3</sup>      **D** 10 000 cm<sup>3</sup>

4 Which object will experience an **elastic** deformation?

- A a car damaged in a collision
- B a football being kicked
- C a log hit by an axe
- D a target hit by an arrow

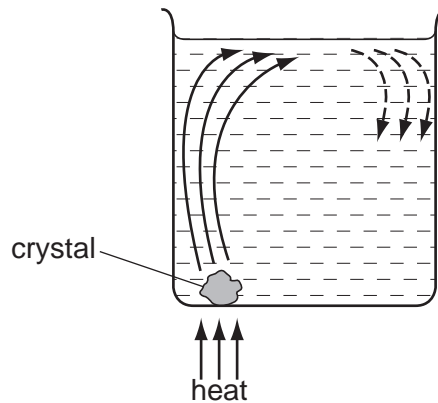
5 When a 300 N force is applied to a box weighing 600 N, the box moves 3.0 m horizontally in 20 s.



What is the average power?

- A 45 W
- B 90 W
- C 900 W
- D 1800 W

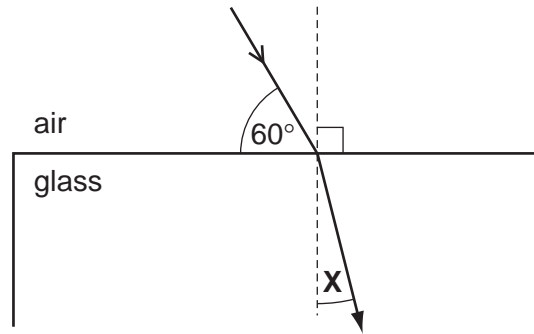
6 The diagram shows a coloured crystal being heated in a beaker of water. The crystal dissolves showing how the water circulates around the beaker.



What is happening to cause the water above the crystal to rise?

- A The water contracts and its density decreases.
- B The water contracts and its density increases.
- C The water expands and its density decreases.
- D The water expands and its density increases.

- 7 A ray of light passes into a glass block of refractive index 1.5.



What is the value of the angle marked **X**?

- A**  $19.5^\circ$       **B**  $25.0^\circ$       **C**  $35.0^\circ$       **D**  $48.5^\circ$
- 8 The diagram shows a positively charged acetate strip and a negatively charged polythene strip that are freely suspended.



Two rods **X** and **Y** are brought up in turn to these two strips.  
 Rod **X** attracts the acetate strip but repels the polythene strip.  
 Rod **Y** does not repel either the acetate strip or the polythene strip.

Which type of charge is on each rod?

	rod <b>X</b>	rod <b>Y</b>
<b>A</b>	negative	positive
<b>B</b>	negative	uncharged
<b>C</b>	positive	negative
<b>D</b>	positive	uncharged

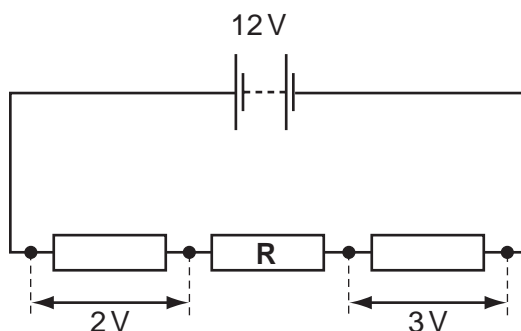
- 9 A current of 2 A flows through a lamp for 1 minute.

How much charge passes through the lamp?

- A** 2 C      **B** 30 C      **C** 60 C      **D** 120 C

- 10 A battery of e.m.f. 12V is connected in series with three resistors.

The p.d. across two of the resistors is shown.



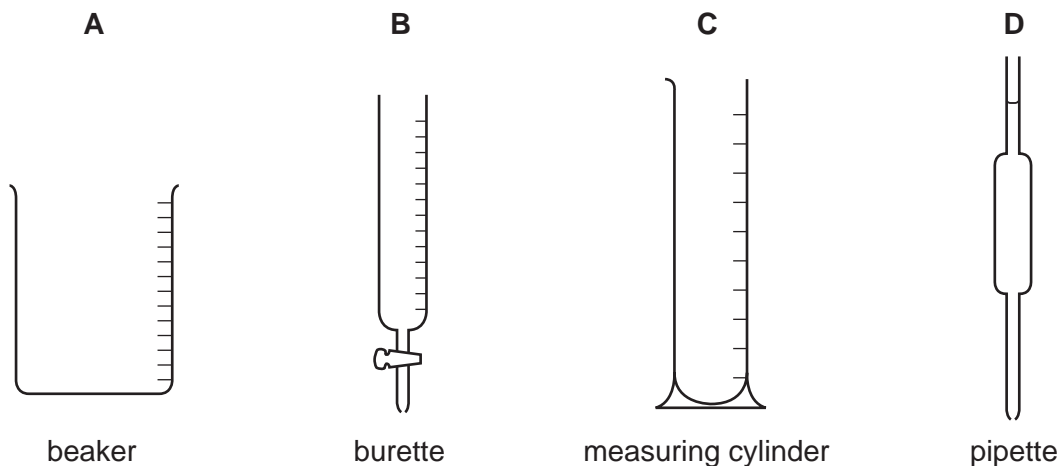
What is the p.d. across the third resistor, **R**?

- A** 3.5V                      **B** 5V                      **C** 7V                      **D** 10V
- 11 Electrical equipment should **not** be used in damp conditions.  
What is the main hazard?
- A** The equipment becomes too hot.  
**B** The fuse keeps 'blowing'.  
**C** The insulation becomes damaged.  
**D** The risk of an electric shock.
- 12 A nuclide of sodium contains 11 protons and 12 neutrons.  
How many electrons are in a neutral atom of this sodium nuclide?
- A** 1                      **B** 11                      **C** 12                      **D** 23
- 13 A radioactive chemical is used to investigate possible damage within a patient's body. The chemical is injected into the patient's body and the radiation detected outside.

Which source of radiation is the most suitable?

	radiation from source	half-life of source
<b>A</b>	beta only	long
<b>B</b>	beta only	short
<b>C</b>	gamma only	long
<b>D</b>	gamma only	short

14 Which piece of apparatus is used to measure **exactly** 22.5 cm<sup>3</sup> of a liquid?



15 An atom of element X is represented by  ${}^7_3\text{X}$ .

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.

16 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<sup>+</sup> and R<sup>-</sup>
- B Q<sup>2+</sup> and R<sup>-</sup>
- C Q<sup>-</sup> and R<sup>+</sup>
- D Q<sup>2-</sup> and R<sup>+</sup>

17 The outer electronic structure of compound J is shown.

Y and Z are different elements.



compound J

Which formula could represent compound J?

- A Cl<sub>2</sub>O
- B CO<sub>2</sub>
- C H<sub>2</sub>O
- D SiO<sub>2</sub>

18 The formula of an oxide of uranium is  $\text{UO}_2$ .

What is the formula of the corresponding chloride?

- A  $\text{UCl}_2$       B  $\text{UCl}_4$       C  $\text{U}_2\text{Cl}$       D  $\text{U}_4\text{Cl}$

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

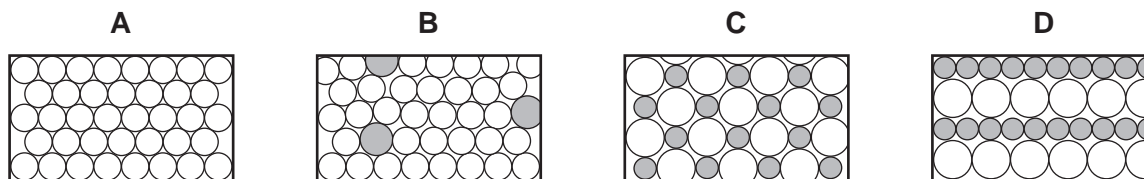
Which ion in the solution makes the solution have a pH less than 7?

- A aluminium  
B chloride  
C hydrogen  
D hydroxide

20 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

21 Which diagram represents the structure of an alloy?



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

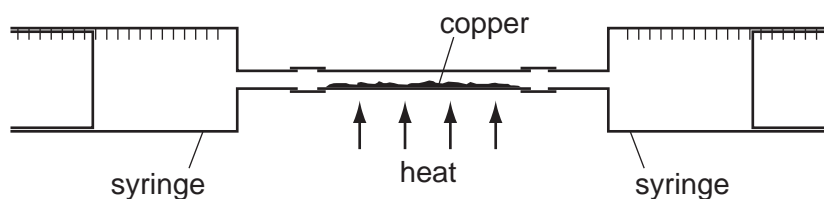
What is the correct order of the ease of reduction of the metal oxides?

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

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

24 In the apparatus shown,  $100\text{ cm}^3$  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  $20\text{ cm}^3$       B  $28\text{ cm}^3$       C  $32\text{ cm}^3$       D  $80\text{ cm}^3$

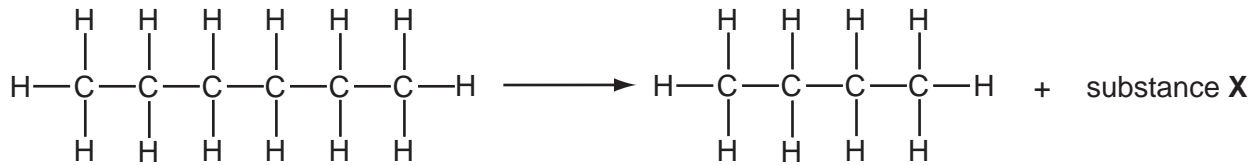
25 The table shows the names of four fractions from petroleum and their uses.

Which fraction is paired correctly with its use?

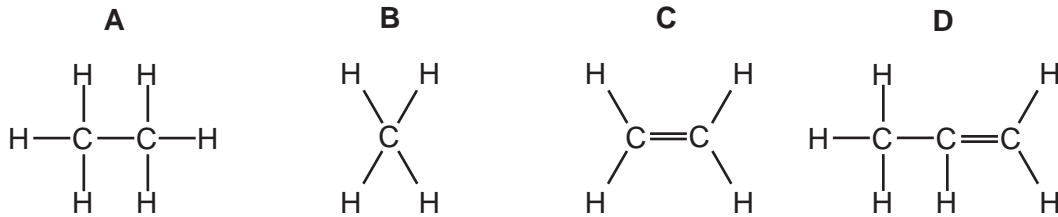
	fraction	use
A	lubricating oil	source of polishes and waxes
B	kerosene	lubricant
C	diesel	making road surfaces
D	gasoline	feedstock for the chemical industry



- 26 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?

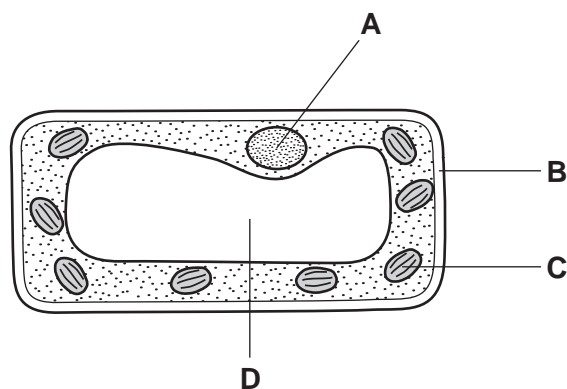


- 27 Yeast is used to convert simple sugars to

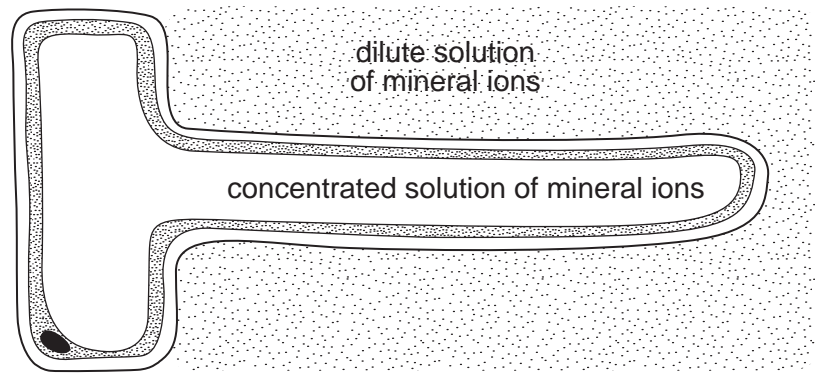
- A ethanoic acid and oxygen.
- B ethanol and carbon dioxide.
- C ethanol and oxygen.
- D starch and carbon dioxide.

- 28 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?



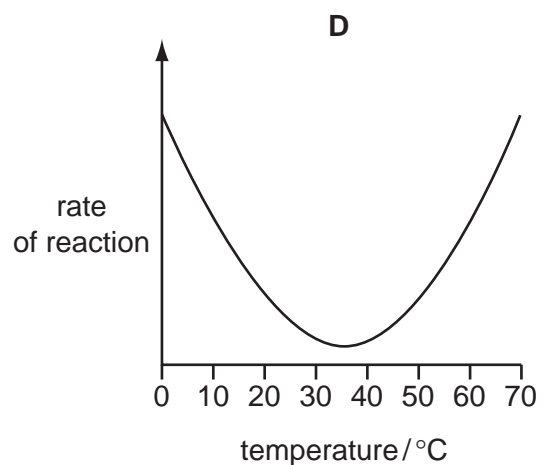
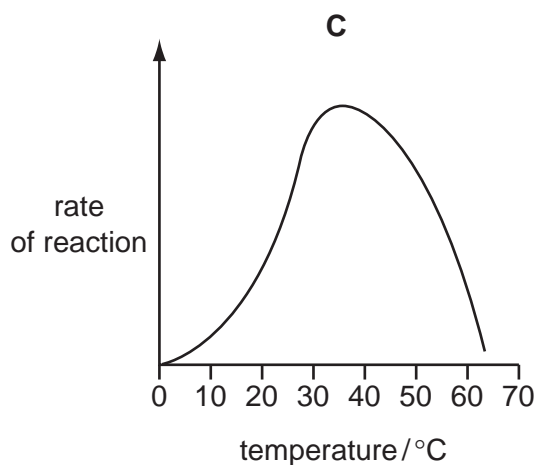
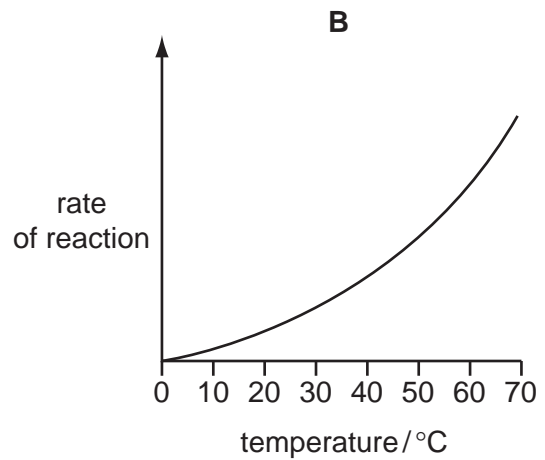
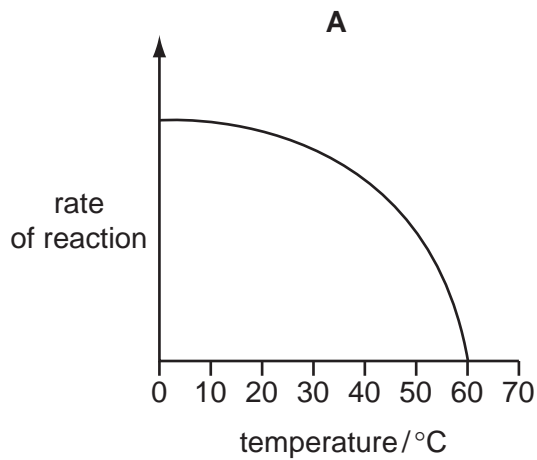
29 The diagram shows a root hair, surrounded by a dilute solution of mineral ions.



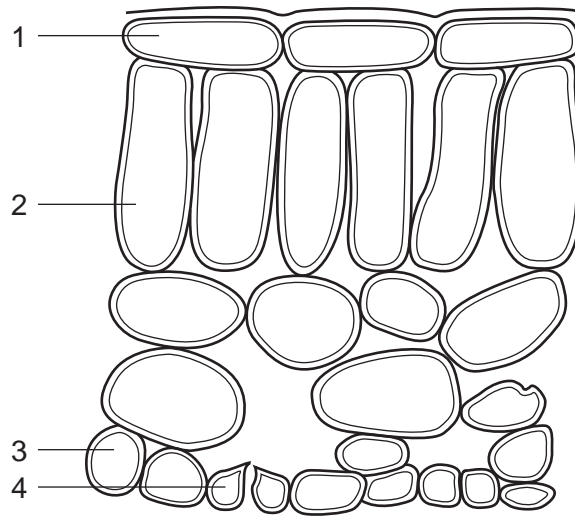
Which statement describes what happens?

- 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.

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



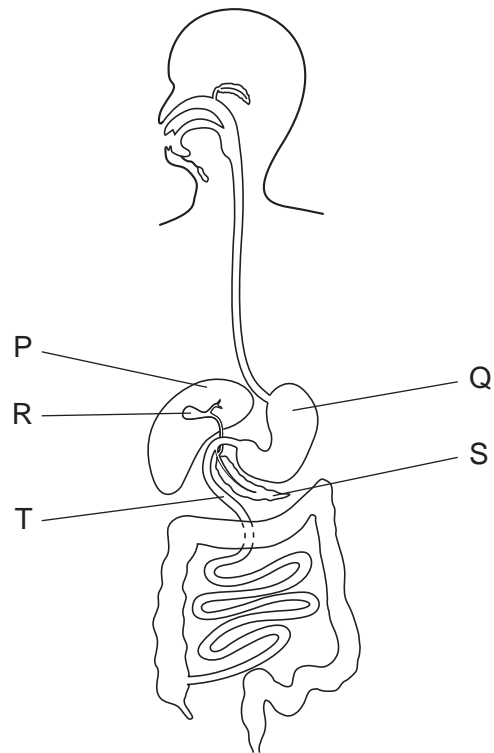
- 31 The diagram shows the arrangement of cells inside the leaf of a green plant.  
(No cell contents are shown.)



Which cells normally contain chloroplasts?

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

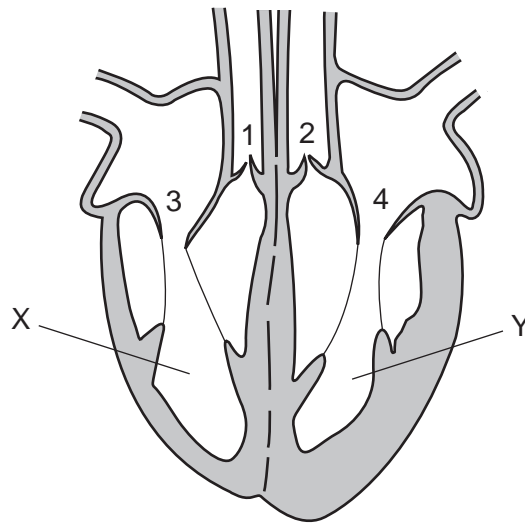
32 The diagram shows the human gut.



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

	where it is made	where it is stored	where it acts
<b>A</b>	P	Q	R
<b>B</b>	P	R	T
<b>C</b>	Q	S	P
<b>D</b>	Q	T	S

33 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
<b>A</b>	closed	closed
<b>B</b>	closed	open
<b>C</b>	open	closed
<b>D</b>	open	open

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

	aerobic respiration	anaerobic respiration
<b>A</b>	carbon dioxide and water	ethanol
<b>B</b>	carbon dioxide and water	lactic acid
<b>C</b>	ethanol	carbon dioxide and water
<b>D</b>	lactic acid	carbon dioxide and water

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

- A** kidney
- B** lung
- C** rectum
- D** skin

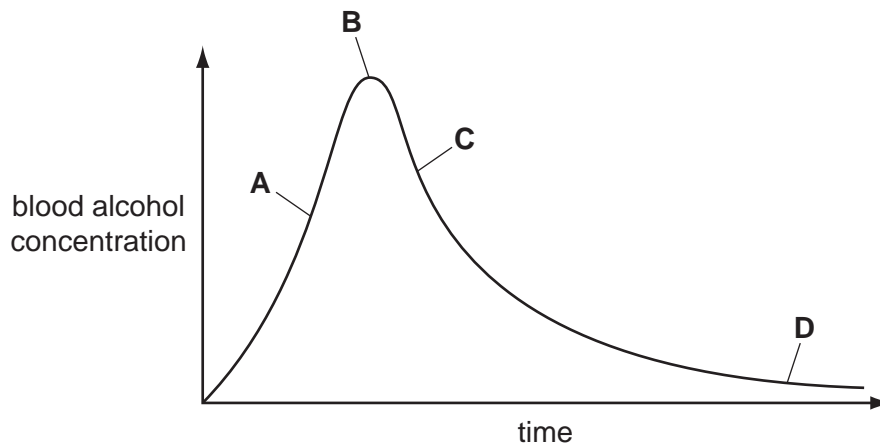
36 What happens in the eye when a person walks from a dark room into sunlight?

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

37 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.

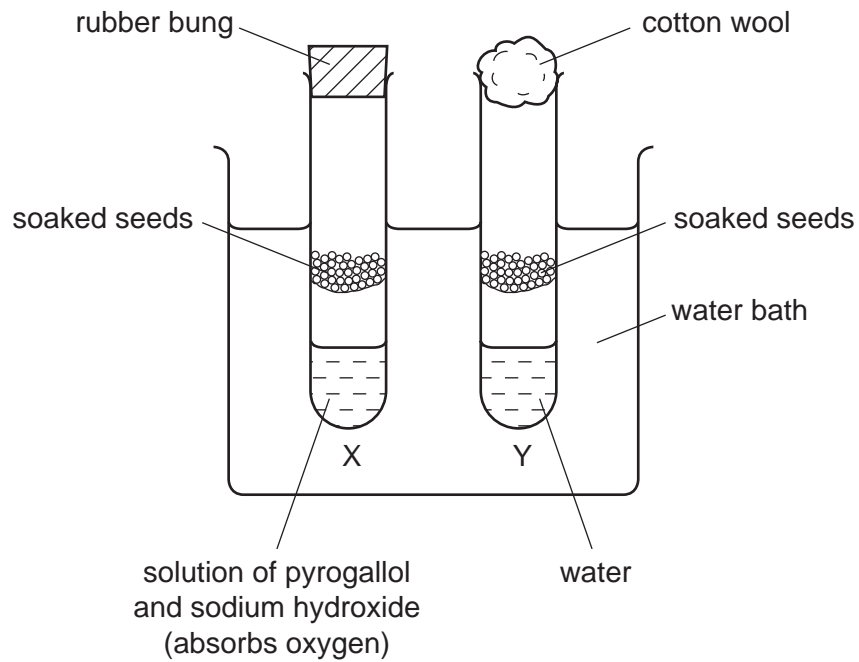
During which period is alcohol removed fastest from the blood?



38 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.

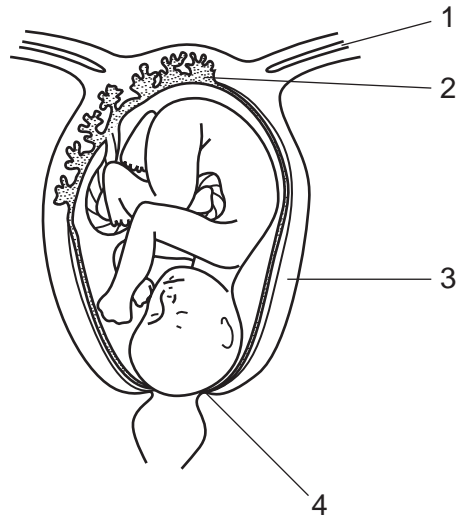
39 The diagram shows an experiment to find out if seeds need oxygen to germinate.



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.

40 Where are the uterus and the cervix?



	uterus	cervix
<b>A</b>	1	2
<b>B</b>	2	1
<b>C</b>	3	4
<b>D</b>	4	3



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**DATA SHEET**  
**The Periodic Table of the Elements**

		Group											
I	II	III	IV	V	VI	VII	0						
		1 <b>H</b> Hydrogen 1					4 <b>He</b> Helium 2						
7 <b>Li</b> Lithium 3	9 <b>Be</b> Beryllium 4						20 <b>Ne</b> Neon 10						
23 <b>Na</b> Sodium 11	24 <b>Mg</b> Magnesium 12	27 <b>Al</b> Aluminium 13	28 <b>Si</b> Silicon 14	31 <b>P</b> Phosphorus 15	32 <b>S</b> Sulphur 16	35.5 <b>Cl</b> Chlorine 17	40 <b>Ar</b> Argon 18						
39 <b>K</b> Potassium 19	40 <b>Ca</b> Calcium 20	70 <b>Ga</b> Gallium 31	73 <b>Ge</b> Germanium 32	75 <b>As</b> Arsenic 33	79 <b>Se</b> Selenium 34	80 <b>Br</b> Bromine 35	84 <b>Kr</b> Krypton 36						
85 <b>Rb</b> Rubidium 37	88 <b>Sr</b> Strontium 38	101 <b>Ru</b> Ruthenium 44	106 <b>Pd</b> Palladium 46	103 <b>Rh</b> Rhodium 45	112 <b>Cd</b> Cadmium 48	127 <b>I</b> Iodine 53	131 <b>Xe</b> Xenon 54						
133 <b>Cs</b> Caesium 55	137 <b>Ba</b> Barium 56	190 <b>Os</b> Osmium 76	195 <b>Pt</b> Platinum 78	184 <b>W</b> Tungsten 74	201 <b>Hg</b> Mercury 80	209 <b>Bi</b> Bismuth 83	226 <b>Ra</b> Radium 88						
87 <b>Fr</b> Francium	227 <b>Ac</b> Actinium	204 <b>Tl</b> Thallium 81	197 <b>Au</b> Gold 79	192 <b>Ir</b> Iridium 77	207 <b>Pb</b> Lead 82	85 <b>At</b> Astatine	86 <b>Rn</b> Radon						
*58-71 Lanthanoid series †90-103 Actinoid series													
58 <b>Ce</b> Cerium	59 <b>Pr</b> Praseodymium	60 <b>Nd</b> Neodymium	61 <b>Pm</b> Promethium	62 <b>Sm</b> Samarium	63 <b>Eu</b> Europium	64 <b>Gd</b> Gadolinium	65 <b>Tb</b> Terbium	66 <b>Dy</b> Dysprosium	67 <b>Ho</b> Holmium	68 <b>Er</b> Erbium	69 <b>Tm</b> Thulium	70 <b>Yb</b> Ytterbium	71 <b>Lu</b> Lutetium
90 <b>Th</b> Thorium	91 <b>Pa</b> Protactinium	92 <b>U</b> Uranium	93 <b>Np</b> Neptunium	94 <b>Pu</b> Plutonium	95 <b>Am</b> Americium	96 <b>Cm</b> Curium	97 <b>Bk</b> Berkelium	98 <b>Cf</b> Californium	99 <b>Es</b> Einsteinium	100 <b>Fm</b> Fermium	101 <b>Md</b> Mendelevium	102 <b>No</b> Nobelium	103 <b>Lr</b> Lawrencium

a = relative atomic mass

X = atomic symbol

b = proton (atomic) number

Key

	<b>X</b>		
a	b	c	d

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

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