Centre Number

Candidate Number

Name

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CAMBRIDGE INTERNATIONAL EXAMINATIONS International General Certificate of Secondary Education

COMBINED SCIENCE

0653/01

Paper 1 Multiple Choice

October/November 2003

45 minutes

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.

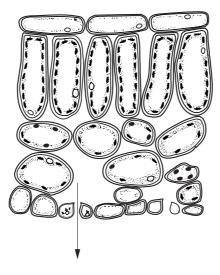
Read the instructions on the Answer Sheet very carefully.

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.

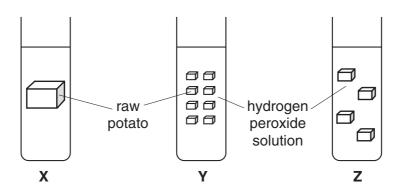
A copy of the Periodic Table is printed on page 20.

www.papaCambridge.com The diagram shows a section through a leaf on a hot and still day. The arrow 1 movement of water vapour.



By which process is the water vapour moving out of the leaf?

- absorption Α
- В diffusion
- С photosynthesis
- D secretion
- 2 Three test tubes, X, Y and Z each contain the same volume of dilute hydrogen peroxide solution. Equal volumes of raw potato are added to each tube but the potato is cut into different sized pieces.



The rate of reaction is different in each tube.

What is the correct order?

	highest rate —		→ lowest rate
Α	X	Υ	Z
В	Y	z	X
С	z	x	Y
D	Z	Υ	x



- 3 Which energy conversion occurs during photosynthesis?
 - A chemical \longrightarrow light
 - \mathbf{B} light \longrightarrow chemical
 - \mathbf{C} heat \longrightarrow light
 - **D** light \rightarrow heat
- 4 A water plant is exposed to sunlight. After a short period of time bubbles are given off from the plant.

Which gas do the bubbles contain, and which process produces this gas?

	gas	process
Α	carbon dioxide	photosynthesis
В	carbon dioxide	respiration
С	oxygen	photosynthesis
D	oxygen	respiration

5 Tests carried out on a sick student show that he is deficient in calcium.

What are his symptoms?

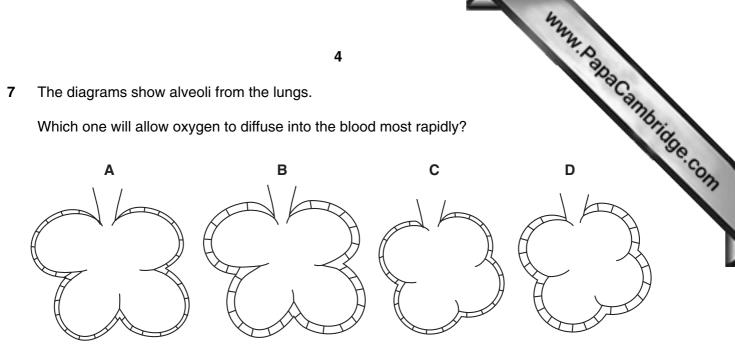
- A anaemia
- **B** bleeding gums
- **C** breathlessness
- **D** poor bone growth
- **6** Tests were performed on four samples of food. The results are shown in the table.

Which food contains protein only?

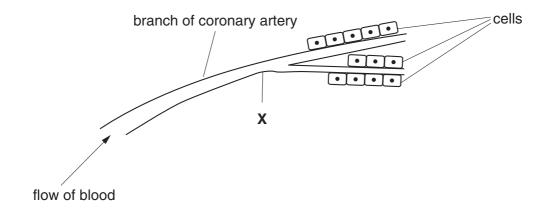
food	results of food tests						
sample	Benedict's test	biuret test	iodine test				
Α	blue	blue	blue/black				
В	blue	purple	brown				
С	red	blue	blue/black				
D	red	purple	brown				

7 The diagrams show alveoli from the lungs.

Which one will allow oxygen to diffuse into the blood most rapidly?



8 The diagram shows the blood supply to a group of muscle cells in the heart.



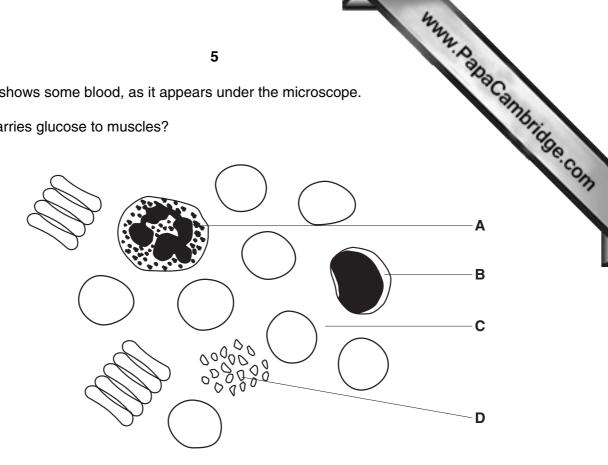
A blockage at point X causes a heart attack because a vital substance cannot reach the cells of the heart.

What is the vital substance?

- amino acid
- В carbon dioxide
- C oxygen
- D urea

9 The drawing shows some blood, as it appears under the microscope.

Which part carries glucose to muscles?



10 Water moves through the stomata of leaves during transpiration.

In which direction, and in which form, does it move?

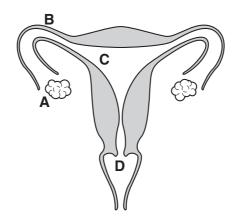
	direction	form
Α	into the leaf	liquid
В	into the leaf	vapour
С	out of the leaf	liquid
D	out of the leaf	vapour

In what order are these structures involved in responding to a stimulus? 11

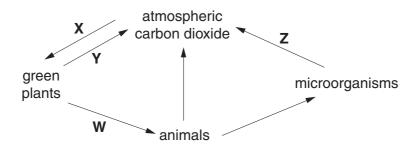
- central nervous system \longrightarrow effector \longrightarrow receptor Α
- В effector \longrightarrow central nervous system \longrightarrow receptor
- C receptor \longrightarrow central nervous system \longrightarrow effector
- D receptor \longrightarrow effector \longrightarrow central nervous system

- 12 During pollination, pollen grains are transferred from
 - A anther to ovule.
 - B anther to stigma.
 - C stigma to anther.
 - **D** stigma to ovule.
- **13** The diagram shows the human female reproductive organs.

Where is a fertilised egg normally implanted?



14 The diagram shows four processes, W, X, Y and Z that form part of the carbon cycle.



Which two processes represent respiration?

- A W and X
- B X and Y
- C Y and Z
- D Z and W

glow then control of ormed.

On heating iron and sulphur together, the mixture starts to glow. The glow then cowhen the heating is stopped.

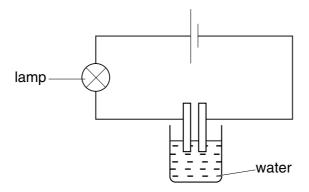
In this reaction,**X**...... heat is given out and a new**Y**...... is formed.

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

	Х	Υ
Α	no	element
В	no	compound
С	some	element
D	some	compound

16 Which material is the main source of the molecules that are used to make most plastics?

- A air
- **B** coal
- **C** limestone
- **D** petroleum
- 17 The apparatus shown can be used to test a property of compound **R**.



When compound **R** is dissolved in the water, the lamp lights.

Which statements about **R** are correct?

	type of bonding	elements in compound
Α	covalent	a metal and a non-metal
В	covalent	non-metals only
С	ionic	a metal and a non-metal
D	ionic	non-metals only

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Α																				
						В									С					

The burning of a hydrocarbon is shown by the equation.

$$C_xH_v + 5O_2 \rightarrow 3CO_2 + 4H_2O$$

What is the formula of the hydrocarbon?

- C_4H_{10}
- $\mathbf{B} \quad \mathbf{C}_4\mathbf{H}_3$
- \mathbf{C} C_3H_8

20 Which words correctly complete the following sentence?

Compared with iron, steel isX...... brittle andY...... resistant to rusting.

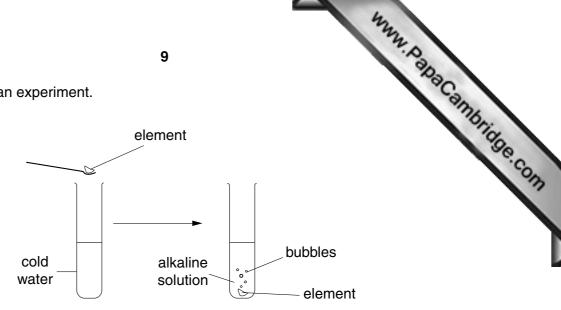
	X	Y
Α	less	less
В	less	more
С	more	less
D	more	more

21 Iron occurs in the ground as iron oxide. Gold occurs as the element.

Which statement explains this?

- Α Gold is more reactive than iron.
- В Gold oxide is more reactive than iron oxide.
- C Iron is more reactive than gold.
- Iron oxide is more reactive than gold oxide. D

22 The diagrams show an experiment.



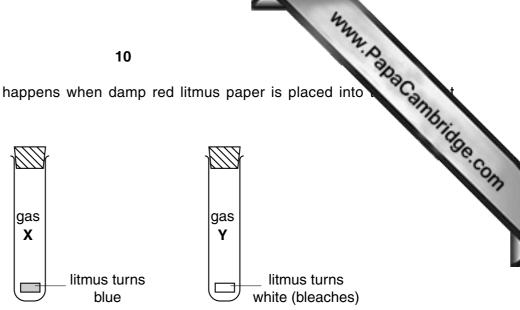
What could the element be?

- Α calcium
- В carbon
- C iron
- D sulphur
- 23 A student wants to make magnesium nitrate by reacting magnesium oxide with an acid.

What is the formula of the acid he should use?

- Α NH_3
- NO_2 В
- C HNO₂
- HNO₃ D

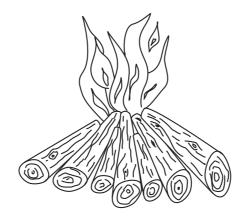
24 The diagram shows what happens when damp red litmus paper is placed into gases, X and Y.



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

	Х	Υ
Α	ammonia	carbon dioxide
В	ammonia	chlorine
С	chlorine	ammonia
D	chlorine	carbon dioxide

25 The diagram shows wood burning.



Which description of wood burning is correct?

- Α Both oxidation and reduction occur.
- В Only decomposition occurs.
- С Only oxidation occurs.
- Only reduction occurs. D

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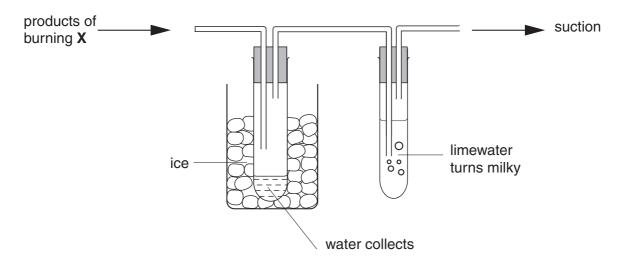
26 A solution is tested for the presence of cations.

test	result
adding an excess of aqueous ammonia	green precipitate

Which cation is present?

- **A** Cu²⁺
- B Fe²⁺
- C Fe³⁺
- **D** Zn²⁺

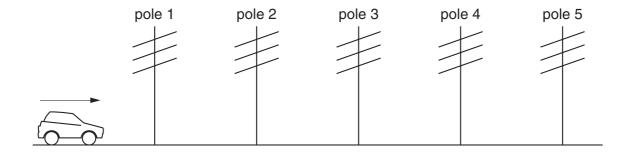
27 When substance **X** burns, two products form.



What is X?

- A carbon monoxide, CO
- **B** ethane, C₂H₆
- **C** hydrogen, H₂
- **D** sulphur, S

- Which of the following is **not** necessary when using a measuring cylinder to measure of a quantity of water?
 - A making sure that the measuring cylinder is vertical
 - **B** making sure that your eye is level with the liquid surface
 - C reading the bottom of the meniscus
 - **D** using the largest measuring cylinder possible
- 29 Five telegraph poles are positioned at equal distances along the side of a road.



A car accelerates until it is level with pole 4. The car then continues along the road at a steady speed. The times taken to travel between one pole and the next are measured.

Which time is the greatest?

The time between

- A pole 1 and pole 2.
- **B** pole 2 and pole 3.
- C pole 3 and pole 4.
- **D** pole 4 and pole 5.
- **30** A student tries to find the density of a metal block. First he measures the weight with a forcemeter (spring balance). Next he measures the sides of the block using a rule, in order to calculate the volume of the block. Finally he divides the weight by the volume to find the density.

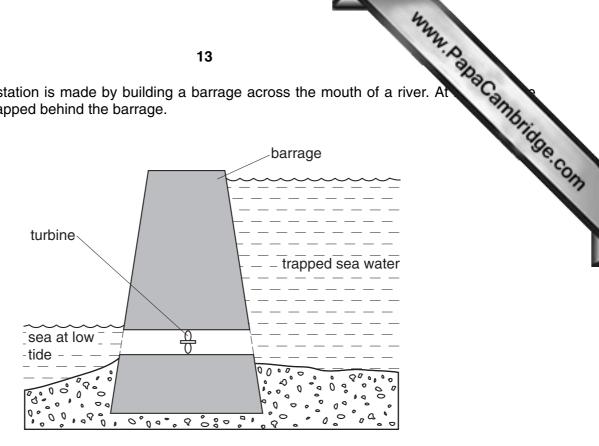
The student has made a mistake.

Why does his method **not** give the density?

- A Density is volume divided by weight.
- **B** He should have measured the surface area, not the volume.
- **C** He should have used the mass in his calculation, not the weight.
- **D** Weight is not measured with a forcemeter (spring balance).

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31 A tidal power station is made by building a barrage across the mouth of a river. At sea water is trapped behind the barrage.



At low tide the water is allowed to flow back into the sea through a turbine.

What is the useful energy change in a tidal power station?

- Α electrical energy \longrightarrow energy of position (potential)
- В electrical energy \longrightarrow energy of motion (kinetic)
- C energy of motion (kinetic) \longrightarrow energy of position (potential)
- D energy of position (potential) -> electrical energy
- 32 There is a vacuum between the double walls of a vacuum flask.

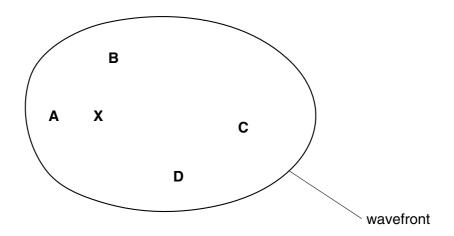
Which types of heat transfer are reduced by the vacuum?

- Α conduction and convection
- В conduction and radiation
- C convection and radiation
- D conduction, convection and radiation

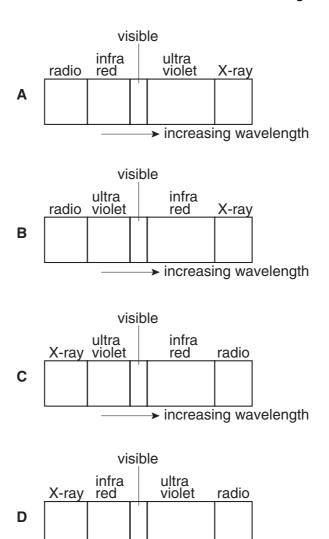
33 Waves travel more slowly on the surface of water when the water is shallow.

www.PapaCambridge.com A person drops a stone into a pool at X. The diagram shows the first wavefront on the sur the pool.

Which region of the pool is likely to be most shallow?

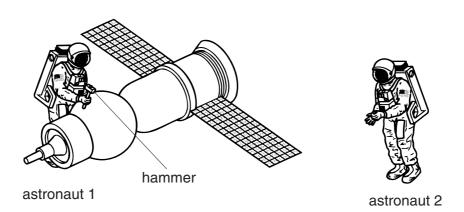


34 Which diagram shows the correct order of the waves in the electromagnetic spectrum?



increasing wavelength

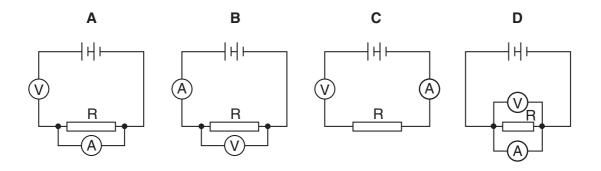
35 Astronaut 1 uses a hammer to mend a satellite in space. Astronaut 2 is nearby: atmosphere in space.



Compared with the sound heard if they were working on Earth, what does astronaut 2 hear?

- A no sound at all
- **B** a quieter sound
- **C** a sound of the same loudness
- **D** a louder sound
- **36** A student wants to find the resistance of resistor R using a voltmeter and an ammeter.

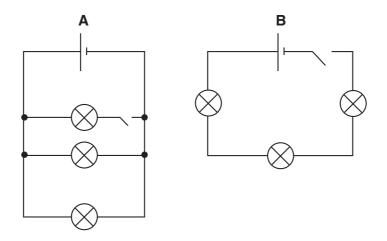
Which circuit should the student use?

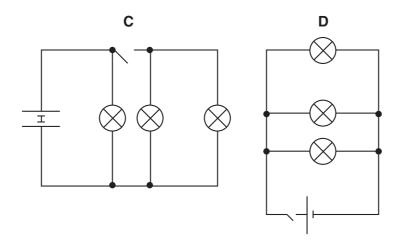


working in parallel, Randonidae, Com

37 Four students are asked to draw a circuit showing three lamps working in parallel, switch that controls all three lamps.

Which student is correct?





38 A 3.0 Ω lamp and a 6.0 Ω lamp are connected in series.

What is the total resistance of the combination?

- A $0.5\,\Omega$
- **B** 2.0Ω
- \mathbf{C} 9.0 Ω
- **D** $18.0\,\Omega$

www.PapaCambridge.com 39 How is electricity transmitted over large distances and why is it transmitted in this way

	how	why
Α	at high voltage	for safety
В	at high voltage	to reduce energy loss
С	at low voltage	for safety
D	at low voltage	to reduce energy loss

40 Which line in the table describes the nature of an α -particle and a γ -ray?

	lpha-particle	γ-ray
Α	helium nucleus	electromagnetic radiation
В	helium nucleus	electron
С	proton	electromagnetic radiation
D	proton	electron

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	Elements
DATA SHEET	The Periodic Table of the

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Lithium	Berylliu	E										Boron	Carbon	Nitrogen	Oxygen	Fluorine	Neon
	4											2	9	7	8		10
23	24											27	28	31	32		40
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Sodium	Magnesium	- E										Aluminium	Silicon	Phosphorus	Sulphur	ne	Argon
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	38	39	40	41	42	43	44		46	47	48	49	50	51	52	53	54
133	137	139	178	181	184		190		195	197	201	204		209			
Cs	Ba	La	Ξ	Та	>	Re	s0	ĭ	₹	Ρ'n	Нg	11	Pb	ä	Po	¥	R
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	26	* 25	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
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0-103	Actino	0-103 Actinoid series		Cerium	Praseodymium	Neodymiur	Promethium		Europium	Gadolinium	Terbium	Dysprosium	Holmium	Erbium	Thulium	Ytterbium	Lutetium
				58	59	09	61	62	63	64	65	99	67	89	69	70	71
		cimoto cuitolos – o		232	L	238	L	L	L	L			L	L		L	_

a = relative atomic mass	X = atomic symbol	b = proton (atomic) number
В	×	b
	<u>></u>	

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Cerium	Praseodymium	Neodymium	Promethium	Samarium	Europium	Gadolinium	Terbium	Dysprosium	Holmium	Erbium	Thulium	Ytterbium	Lutetium
28	29	09	61	62	63	64	65	99	29	89	69	70	74
232 Th	Pa Protactinium	238 Uranium	N eptunium	Pu Plutonium	Am Americium	Curium	B Erkelium	Cf Californium	Einsteinium	F B	Md Mendelevium	N obelium	Md No Lr
06	91	95	93	94	98	96	26	86	66	100	101	102	0
The vo	The volume of one mole of any gas is $24\mathrm{dm^3}$ at room temperature and pressure (r.t.p.).	ne mole	of any ga	s is 24 dn	n³ at roon	n tempera	ature and	pressure	(r.t.p.).				Can
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