



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS International General Certificate of Secondary Education

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COMBINED SCIENCE 0653/11

May/June 2013 Paper 1 Multiple Choice

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.

DO NOT WRITE IN ANY BARCODES.

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.

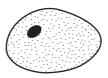
Electronic calculators may be used.







- 1 Which substance can enter a plant cell by diffusion?
 - A carbon dioxide
 - **B** cellulose
 - **C** protein
 - **D** starch
- 2 The diagram shows an animal cell. The maximum diameter of the diagram is 25 mm.



The actual cell was 0.02 mm maximum diameter.

What is the magnification of the drawing?

- **A** ×25
- **B** ×200
- **C** ×1250
- **D** ×2500
- **3** A test-tube contains a solution of an enzyme.

Which colour is obtained when the biuret test is carried out on this solution?

- A blue
- **B** blue-black
- C orange
- **D** purple
- **4** Which two chemical substances are required for photosynthesis?
 - A carbon dioxide and glucose
 - B glucose and oxygen
 - **C** oxygen and water
 - **D** water and carbon dioxide

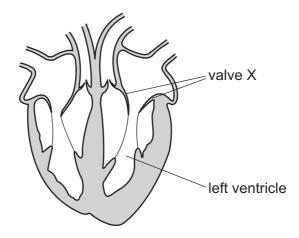
5 Mixtures were made from 5 cm³ of a starch solution and 2 cm³ of a solution of an digests starch. The mixtures were all kept at the same temperature.

The table shows the different concentrations of the starch and starch-digesting enzyme solution each mixture.

In which mixture would it take the longest time for all the starch to disappear?

	concentration of starch solution/%	concentration of starch-digesting enzyme/%
Α	4	8
В	4	4
С	2	8
D	2	4

- **6** What is the word equation for aerobic respiration?
 - A carbon dioxide + glucose → oxygen + water
 - **B** carbon dioxide + water → glucose + oxygen
 - C glucose + oxygen → carbon dioxide + water
 - **D** oxygen + water → carbon dioxide + glucose
- 7 The diagram shows a section through the heart.



Which events occur as the left ventricle contracts?

- A atrial wall contracts and valve X closes
- **B** atrial wall contracts and valve X opens
- C atrial wall relaxes and valve X closes
- **D** atrial wall relaxes and valve X opens

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8 In what form is water as it enters and is lost from a plant?

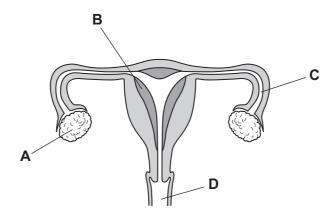
	as it enters	as it is lost
Α	liquid	liquid
В	liquid	vapour
С	vapour	liquid
D	vapour	vapour

9 What is the effect of adrenaline in the control of metabolic activity?

	blood glucose concentration	rate of heart beat
Α	decreases	decreases
В	decreases	increases
С	increases	decreases
D	increases	increases

10 The diagram shows a section through the female reproductive system.

Where is the fertilised egg implanted?



11 What describes asexual reproduction?

	number of parents	a zygote is produced	offspring identical to the parent
Α	1	no	yes
В	1	yes	no
С	2	no	yes
D	2	yes	no



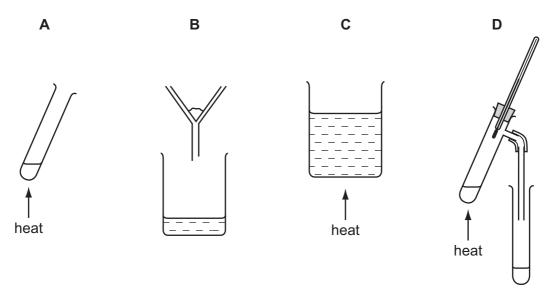
- 12 What occurs about two weeks after menstruation?
 - A the release of a gamete from an ovary
 - **B** the release of a gamete from the uterus
 - **C** the release of a zygote from an ovary
 - D the release of a zygote from the uterus
- 13 The diagram shows five organisms in a food chain.

$$T \,\rightarrow\, U \,\rightarrow\, V \,\rightarrow\, W \,\rightarrow\, X$$

Which organisms are consumers?

- **A** T, U and V
- **B** T, W and X
- **C** T, V and X
- **D** U, V and W
- **14** Aqueous copper(II) sulfate consists of copper(II) sulfate dissolved in water.

Which apparatus could **not** be used to remove water from this solution?

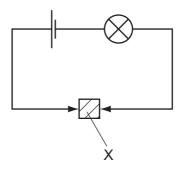


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15 A solid X is placed in the circuit shown.

The lamp lights.



What is X?

- A an alloy
- B a compound
- **C** an electrolyte
- **D** a salt
- **16** The reaction of zinc and sulfur to form zinc sulfide is exothermic.

Which information in the table is correct?

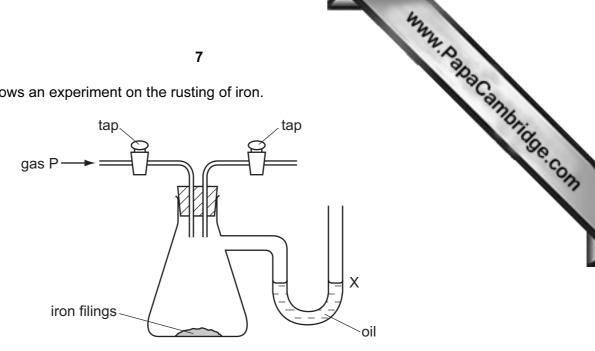
	elements in zinc sulfide	energy change during the formation of zinc sulfide
Α	difficult to separate	heat given out
В	difficult to separate	heat taken in
С	easy to separate	heat given out
D	easy to separate	heat taken in

17 A student carries out experiments with zinc and dilute hydrochloric acid.

Which change in conditions makes the reaction slower?

- A adding a suitable catalyst
- B increasing the concentration of the acid
- C increasing the particle size of the zinc
- **D** increasing the temperature

18 The diagram shows an experiment on the rusting of iron.



The flask is filled with gas P. The taps are closed and the apparatus is left for a week.

The experiment is repeated with four different gases.

What happens to the oil level at X?

	gas P	oil level at X
Α	damp nitrogen	rises
В	damp oxygen	falls
С	dry nitrogen	falls
D	dry oxygen	rises

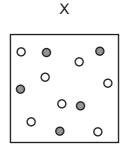
- 19 Which mixture cannot be separated by distillation?
 - Α air
 - В petroleum
 - C salt water
 - sulfur and iron D
- 20 Which statements about air are correct?
 - Air contains a small amount of argon which is a noble gas.
 - 2 Air is made up of 78% oxygen and 21% nitrogen.
 - 3 Air contains carbon dioxide which is a product of both respiration and the combustion of natural gas.

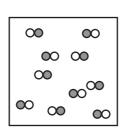
1, 2 and 3 1 and 2 only C 1 and 3 only **D** 2 and 3 only

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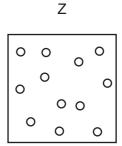


- 21 Which substance conducts electricity?
 - **A** CO₂(g)
- **B** NaCl(s)
- C NaOH(aq)
- D S(s)
- 22 The diagrams represent the particles in substances X, Y and Z.





Υ



Which row correctly identifies X, Y and Z as an element, a compound or a mixture?

	element	compound	mixture
Α	X	Y	Z
В	Υ	Z	X
С	Z	Х	Υ
D	Z	Y	X

23 The equation shows the reaction of copper oxide with carbon.

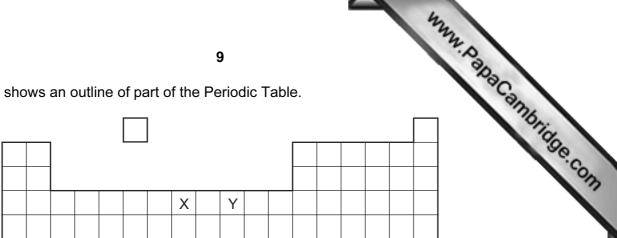
$$2CuO + C \rightarrow 2Cu + CO_2$$

In the reaction, the carbon is the1..... agent and is2..... during the reaction.

Which words complete gaps 1 and 2?

	1	2
Α	oxidising	oxidised
В	oxidising	reduced
С	reducing	oxidised
D	reducing	reduced

- 24 Which pair of gases can be identified using limewater and damp litmus paper?
 - A carbon dioxide and chlorine
 - B carbon dioxide and hydrogen
 - C chlorine and oxygen
 - D hydrogen and chlorine



What do elements X and Y have in common?

- They form coloured compounds.
- 2 They can be used as catalysts.
- 3 They have low melting points.
- **A** 1, 2 and 3
- **B** 1 and 2 only
- C 1 and 3 only
 - **D** 2 and 3 only

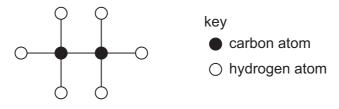
26 Three boiling tubes are each filled with a gas from Group VII in the Periodic Table.

Gas 1 is brown. Gas 2 is purple. Gas 3 is green.

Which gases are in the tubes?

	gas 1	gas 2	gas 3
Α	Cl	I	Br
В	Br	Cl	I
С	Br	I	Cl
D	I	Br	Cl

27 The diagram shows a molecule of ethane.



What is the molecular formula of ethane?

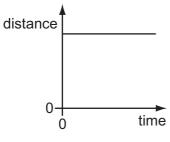
A CH₆

B CH₃

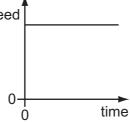
 $\mathbf{C} \quad \mathsf{C}_2\mathsf{H}_4$

 $D C_2H_6$

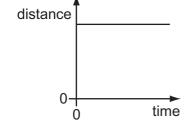
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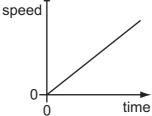


speed

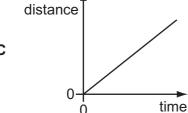


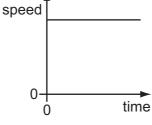
В



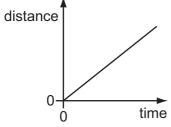


С

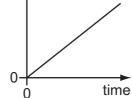




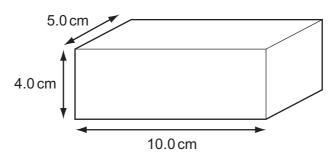
D



speed



www.PapaCambridge.com 29 A rectangular metal block has the dimensions shown. The density of the metal is 8.0



What is the mass of the metal block?

- 160 g
- 320 g
- 400 g
- 1600g

30 Which energy resource is non-renewable?

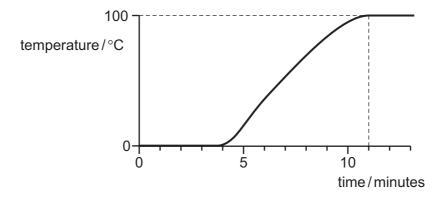
- geothermal energy Α
- hydroelectric energy В
- C nuclear energy
- wave energy

31 When sweat evaporates, which change of state takes place?

- gas to liquid
- В liquid to gas
- liquid to solid C
- D solid to gas

32 A block of ice is supplied with heat at a constant rate. Eventually, the melted ice boils.

The graph shows how the temperature changes with time.



How long does it take to melt all the ice?

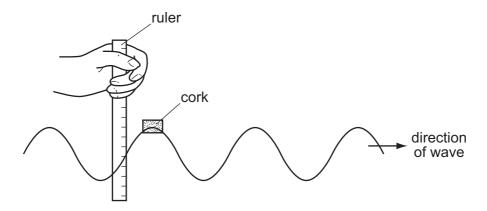
- 4 minutes
- 7 minutes
- 11 minutes
- 13 minutes

© UCLES 2013 [Turn over 33 The International Space Station orbits the Earth in the vacuum above the atmosphere

The electrical systems in the Space Station produce heat.

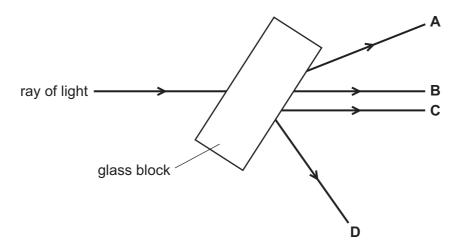
www.papaCambridge.com How is this heat transferred from the external surfaces of the Space Station into space?

- conduction only Α
- В convection only
- C radiation only
- D conduction, convection and radiation
- **34** A student measures the distance a cork moves up and down on a wave in a tank of water.



Which quantity can she obtain from this measurement?

- amplitude
- frequency В
- C speed
- wavelength
- 35 Which labelled ray shows the path of the ray of light after it has passed through the glass block?



36 Electromagnetic waves have many different applications.

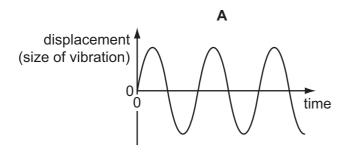
www.PapaCambridge.com Which row identifies the type of electromagnetic wave used in each application?

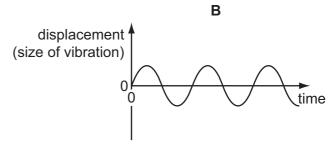
	satellite television	terrestrial television (not satellite)	television remote controllers
Α	microwaves	radio waves	infrared waves
В	microwaves	radio waves	microwaves
С	radio waves	infrared waves	infrared waves
D	radio waves	infrared waves	microwaves

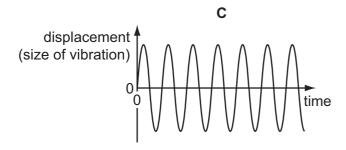
37 A microphone is connected to an oscilloscope. The oscilloscope produces graphs of four different sounds.

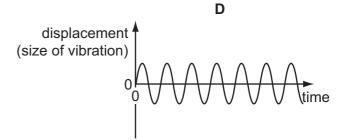
The scales for the graphs are the same.

Which graph shows the quietest sound with the highest pitch?







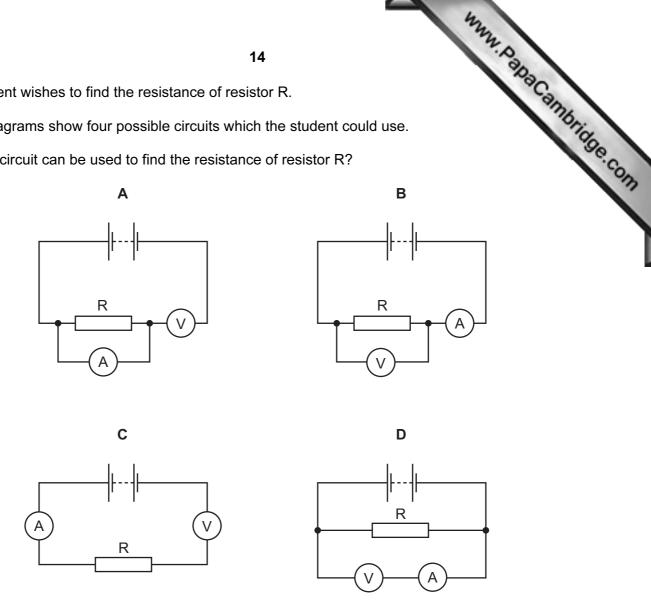


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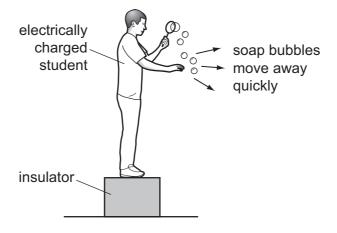
38 A student wishes to find the resistance of resistor R.

The diagrams show four possible circuits which the student could use.

Which circuit can be used to find the resistance of resistor R?



39 An electrically charged student produces soap bubbles. When he holds his hand near the bubbles, they move away quickly from his hand.



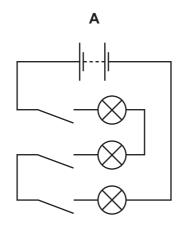
For this movement of the bubbles to happen, which statement is correct?

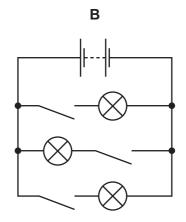
- The bubbles must be negatively charged. Α
- В The bubbles must be positively charged.
- C The bubbles must have the opposite charge to the charge on the student.
- D The bubbles must have the same charge as the charge on the student.

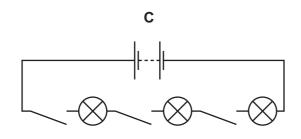
och lamp can be

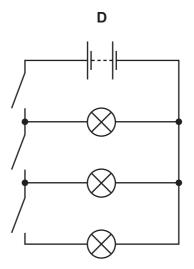
40 An electrician wishes to connect three lamps in a circuit so that each lamp can be and off separately.

Which circuit should be used?









The Periodic Table of the Elements DATA SHEET

				1	6				mm.	Dana Cambrida
0	4 He Helium	20 Ne Neon 10	40 Ar Argon	84 Kry Krypton 36	131 Xe Xenon 54	Radon 86		Lu Lutetium 71	Lr Lawrencium 103	Cambri
=		19 Fluorine	35.5 C1 Chlorine	80 Br Bromine 35	127 T lodine	At Astatine 85		173 Yb Ytterbium 70	Nobelium 102	13
>		16 Oxygen	32 S Sulfur 16	79 Selenium 34	128 Te Tellurium 52	Po Polonium 84		169 Tm Thulium 69	Md Mendelevium 101	
>		14 X Nitrogen 7	31 P Phosphorus 15	75 AS Arsenic 33	122 Sb Antimony 51	209 Bi Bismuth		167 Er Erbium 68	Fm Fermium 100	
≥		12 Carbon 6	28 Si Silicon	73 Ge Germanium 32	Sn Tin 50	207 Pb Lead		165 Ho Holmium 67	ES Einsteinium 99	(r.t.p.).
≡		11 Boron 5	27 A1 Auminium 13	70 Ga Gallium	115 In Indium	204 T 1 Thallium		162 Dy Dysprosium 66	Californium	The volume of one mole of any gas is $24\mathrm{dm}^3$ at room temperature and pressure (r.t.p.).
				65 Zn Zinc 30	112 Cd Cadmium 48	201 Hg Mercury		159 Tb Terbium 65	Bk Berkelium 97	ature and
				64 Cu Copper 29	108 Ag Siver 47	197 Au Gold		157 Gd Gadolinium 64	Cm Curium 96	n tempera
 				59 Ni Nickel	106 Pd Palladium 46	195 Pt Platinum 78		152 Eu Europium 63	Am Americium 95	ກ³ at roor
				59 Co Cobalt	Rhodium 45	192 Ir		150 Sm Samarium 62	Pu Plutonium	ıs is 24 dr
	1 Hydrogen			56 Fe Iron	Ru Ruthenium 44	190 Os Osmium 76		Pm Promethium 61	Neptunium	of any ga
				Manganese	Tc Technetium 43	186 Re Rhenium		144 Nd Neodymium 60	238 U Uranium	one mole
				Chromium	96 Mo Molybdenum 42	184 W Tungsten 74		Pr Praseodymium 59	Pa Protactinium 91	olume of
				51 Vanadium 23	Niobium N1	181 Ta Tantalum 73		140 Ce Cerium	Th Thorium	The v
				48 T tanium 22	2r Zirconium 20	178 H afnium * 72		1	nic mass bol nic) number	
				Scandium 21	89 ≺ Yttrium	139 La Lanthanum 57 *	Actinium + 89	l series eries	 a = relative atomic mass X = atomic symbol b = proton (atomic) number 	
=		9 Be Beryllium	24 Mg Magnesium	40 Ca Calcium	Sr Strontium	137 Ba Barium 56	226 Ra Radium 88	*58-71 Lanthanoid series 190-103 Actinoid series	« × ⊕	
_		7 Li Lithium 3	23 Na Sodium	39 K	Rb Rubidium 37	133 Cs Caesium 55	Fr Francium 87	58-71 L _ℓ	Key	

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