



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS International General Certificate of Secondary Education

Se. COM

COMBINED SCIENCE

0653/11

Paper 1 Multiple Choice

October/November 2011

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**.

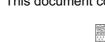
Choose the one you consider correct and record your choice in soft pencil on the separate Answer Sheet.

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.

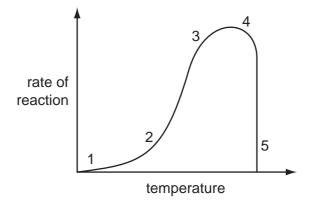
A copy of the Periodic Table is printed on page 16.



www.PapaCambridge.com Which parts of a cell control its activities and control what enters and leaves it? 1

	controls cell's activities	controls what enters and leaves the cell
Α	chloroplast	cell surface membrane
В	chloroplast	cell wall
С	nucleus	cell surface membrane
D	nucleus	cell wall

- Which part of a plant cell is made of cellulose?
 - cell membrane
 - В cell wall
 - chloroplast
 - D nucleus
- The graph shows the effect of temperature on the rate of an enzyme-controlled reaction. 3



Where on the graph has all the enzyme been denatured?

- Α 1
- 2 and 3
- 3 and 4
- 5 D
- Which leaf tissue has specialised cells that surround stomata?
 - epidermis Α
 - palisade mesophyll
 - phloem
 - xylem

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5 What happens during digestion?

	large pieces of food are broken into small pieces	large molecules are broken into small molecules
Α	✓	✓
В	✓	x
С	x	✓
D	×	×

6 Oxygenated blood returns to the heart from the lungs in vessel X and leaves the heart to circulate around the body in vessel Y.

What are X and Y?

	X	Υ
Α	aorta	pulmonary vein
В	pulmonary artery	vena cava
С	pulmonary vein	aorta
D	vena cava	pulmonary artery

7 When a leaf is photosynthesising, in which direction do gases diffuse through the stomata?

	carbon dioxide	oxygen
Α	in	in
В	in	out
С	out	in
D	out	out

8 The table shows the level of alcohol in a person's blood after drinking two litres of beer.

time after drinking beer (hours)	alcohol in the blood (grams/dm³)
1	7
2	5
3	3
4	0

How long will it be (in hours) before the person's reaction time returns to normal?

A 0 to 1

B 1 to 2

C 2 to 3

D 3 to 4

ad of sypherican and of sypher

- 9 Which method of family planning is also likely to reduce the risk of the spread of syph
 - A condom
 - **B** intra-uterine device (IUD)
 - C pill
 - **D** sterilisation
- 10 A species of animal reproduces both sexually and asexually.

Which offspring will be clones?

	offspring from sexual reproduction	offspring from asexual reproduction
Α	✓	✓
В	✓	x
С	x	✓
D	X	X

11 Albino humans cannot make any pigment in their skin.

A pale-skinned student, who is **not** an albino, sits in the sun on a number of days. The student's skin becomes suntanned (darker).

What causes this suntanning to happen?

- A the environment and the student's albino alleles
- **B** the environment and the student's non-albino alleles
- C the environment only
- D the student's genes only

12 The diagram shows a food chain.



www.PapaCambridge.com Which types of energy are represented by the black arrows and by the white arrows?

	black arrows	white arrows
Α	chemical	heat
В	chemical	light
С	heat	chemical
D	light	chemical

13 Which process reduces soil erosion on hilly ground?

- A cutting down the trees
- increasing the number of grazing animals В
- ploughing up and down the hilly ground C
- **D** terracing the hilly ground

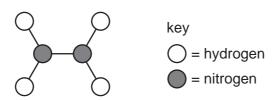
14 Element X has a nucleon number of 40.

The electron arrangement of element X is 2,8,8.

Which statements about element X are correct?

- It has 40 neutrons in its nucleus.
- 2 It has 2 electrons in its outer shell.
- 3 It is unreactive.
- It is in Group 0 of the Periodic Table. 4
- 1 and 2 **B** 1 and 3 **C** 2 and 4 **D** 3 and 4

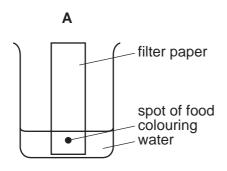
15 A model of a molecule is shown.

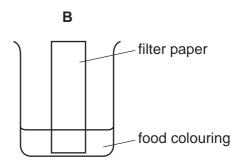


Which description and formula are correct for this molecule?

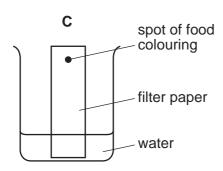
	description	formula
Α	compound	NH ₂
В	compound	N_2H_4
С	mixture	NH_2
D	mixture	N_2H_4

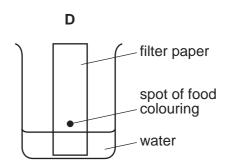
16 Which diagram shows how a mixture of dyes in a food colouring are separated?





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17 Which equation is correctly balanced?

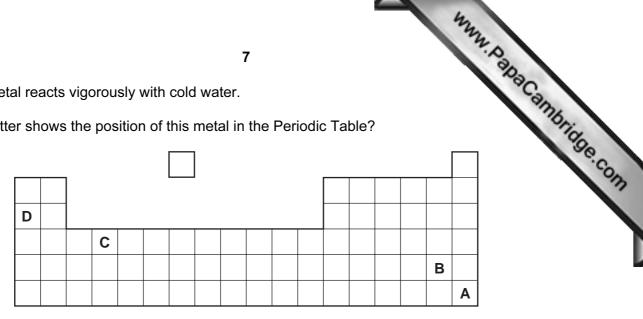
A
$$2Al + 3Cl_2 \rightarrow 2AlCl_3$$

B Fe₂O₃ + 3C
$$\rightarrow$$
 2Fe + 3CO₂

C KC
$$l$$
 + Br₂ \rightarrow KBr + C l_2

D Na +
$$H_2O \rightarrow NaOH + H_2$$

Which letter shows the position of this metal in the Periodic Table?



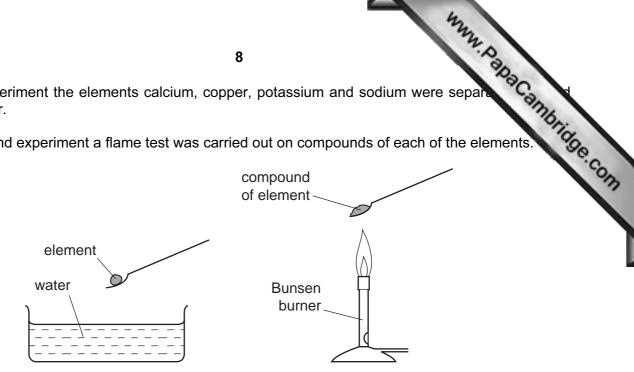
- 19 Which two elements do not form an alloy?
 - A carbon and sulfur
 - В carbon and iron
 - C copper and zinc
 - **D** silver and gold
- 20 Sulfur dioxide is formed as a pollutant when fossil fuels are burned.

Which properties does sulfur dioxide have?

	toxic	acidic	corrosive
Α	✓	✓	✓
В	✓	✓	X
С	✓	X	x
D	X	X	X

21 In an experiment the elements calcium, copper, potassium and sodium were separa with water.

In a second experiment a flame test was carried out on compounds of each of the elements.



Which row correctly shows the reaction of the elements with water and the colour of the flame?

	element	reaction with water	colour of the flame
Α	calcium	vigorous	green
В	copper	no reaction	red
С	potassium	vigorous	lilac
D	sodium	no reaction	yellow

22 When compound X is added to pure water, the pH increases.

Which formula could **not** be a correct formula for X?

- A HNO₃
- KOH
- NaOH
- NH_3

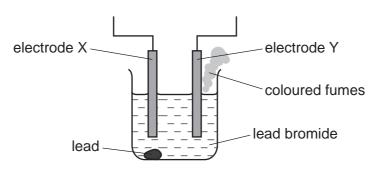
23 Ethene burns as shown.

$$C_2H_4(g) + 3O_2(g) \rightarrow 2CO_2(g) + 2H_2O(I)$$

What happens to ethene in this reaction?

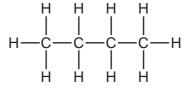
- A decomposition
- В neutralisation
- C oxidation
- reduction

Lead is formed at electrode X and coloured fumes at electrode Y.



Which statement about the electrolysis of lead(II) bromide is correct?

- Electrode X is the anode.
- В The colour of the fumes is brown.
- C The lead(II) bromide is in aqueous solution.
- The mass of the lead(II) bromide does not change during the reaction. D
- 25 Which change does **not** alter the rate of reaction between zinc and dilute sulfuric acid?
 - addition of a catalyst
 - В change in concentration of the acid
 - C change in atmospheric pressure
 - change in temperature
- 26 The structure of a molecule is shown.



Which term correctly describes this molecule?

- hydrocarbon
- В monomer
- petroleum
- D polymer

27 Many molecules of X combine to form a single molecule Y as shown in the equation.

$$n\: X\to Y$$

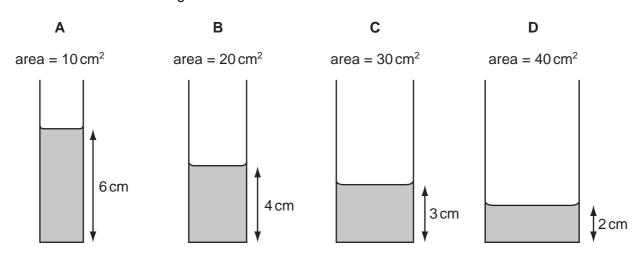
(n is a very large number)

Which terms best describe X and Y in this reaction?

	X	Υ
Α	fraction	monomer
В	monomer	fraction
С	monomer	polymer
D	polymer	fraction

28 Some water is poured into four tubes of different cross-sectional areas.

Which tube holds the largest volume of water?



- **29** What is the meaning of the *weight* of an object?
 - A the density of the material from which it is made
 - **B** the force exerted on it by gravity
 - **C** the mass of the matter it contains
 - **D** the pressure it exerts on the ground

30 The table gives information about a liquid in a container.

depth of liquid	10 cm
mass of liquid	30 g
temperature of liquid	25°C
volume of liquid	20 cm ³

What is the density of the liquid?

- **A** 0.33 cm/g
- **B** 1.2g/°C
- **C** $1.5 \,\mathrm{g/cm^3}$
- **D** 3.0 g/cm

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31 An object travels 6.0 km in 2 minutes.

What is its speed?

- **A** 0.050 m/s
- **B** 3.0 m/s
- **C** 50 m/s
- **D** 3000 m/s

32 Which source releases energy by burning when it is used in the process of generating electricity?

- A a fossil fuel
- **B** hydroelectric
- C nuclear
- **D** solar

33 Why is a fuse used in an electric circuit in a house?

- A to increase the resistance of the circuit
- **B** to keep the power used to a minimum value
- C to prevent a short circuit from occurring
- **D** to stop the cables overheating

34 Diagram 1 shows two identical resistors R_1 and R_2 connected in series in a circuit.

 R_2 is then removed, as shown in diagram 2.

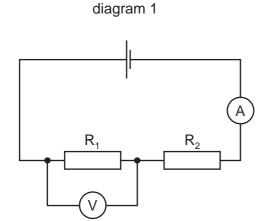
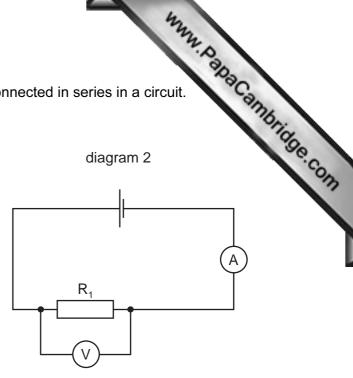


diagram 2



How do the readings on the ammeter and the voltmeter change when R_2 is removed?

	ammeter	voltmeter
Α	decreases	decreases
В	decreases	increases
С	increases	decreases
D	increases	increases

35 Which row shows two of the essential items used in the construction of a transformer?

	iron core	permanent magnet	primary coil	slip rings
Α	✓	✓		
В	✓		✓	
С		✓		✓
D			✓	✓

36 When flying, some birds use warm air currents to gain height.

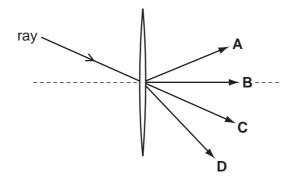
What is the cause of these currents?

- conduction
- В convection
- C evaporation
- radiation

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- 37 Which is the best description of a wave that is a quiet, high-pitched sound?
 - A large amplitude and high frequency.
 - **B** large amplitude and low frequency.
 - **C** small amplitude and high frequency.
 - **D** small amplitude and low frequency.
- **38** A ray of light passes through the centre of a thin converging lens.

In which direction does the ray leave the lens?



39 The diagram shows the spectrum of electromagnetic waves.

Which labelled region represents gamma rays?

А	micro waves	В	visible light	С	X-rays	D
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increasing frequency -----

40 Which nuclear process occurs in the Sun, and which process is used in a nuclear power station?

	in the Sun	in a nuclear power station
Α	fission	fission
В	fission	fusion
С	fusion	fission
D	fusion	fusion

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The Periodic Table of the Elements DATA SHEET

								Gre	Group								
_	=											Ξ	N	>	IN	II/	0
							1 Hydrogen										4 He Helium
7 Li Lithium	Be Beryllium							1				11 Boron 5	12 C Carbon 6	14 N itrogen 7	16 Oxygen 8	19 T Fluorine	20 Neon 10
Na Sodium	24 Magnesium											27 A1 Aluminium 13	28 Si Silicon	31 Phosphorus 15	32 S Sulfur	35.5 C1 Chlorine	40 Ar Argon
≋ ⊻	Ca ⁴⁰	45 Sc	48	5 >	²⁵ రే	55 Mn	₅₆	₈ %		⁶⁹	ss Zn	o₂ Ga	73 Ge	75 As	79 Se	80 B	8 7
Potassium 19	Calcium 20	Scandium 21	Titanium 22	Vanadium 23	Chromium 24	m Manganese 25	26	Cobalt 27	_	Copper 29	30	Gallium 31	Germanium 32	Arsenic 33	Selenium 34	Φ	Krypton 36
Rb Rubidium	Strontium	89 ×	91 Zr Zirconium 40	93 Nb Niobium 41	96 Mo Molybdenum 42	Tc Technetium 43	Ru Ruthenium 44	103 Rh Rhodium 45	106 Pd Palladium 46	108 Ag Silver 47	Cadmium 48	115 In Indium 49	119 Sn Tin	122 Sb Antimony 51	128 Te Tellurium 52	127 I lodine 53	131 Xe Xenon 54
Caesium 55	137 Ba Barium 56	139 La Lanthanum s	178 Hf Hafnium 72	181 Ta Tantalum 73	184 W Tungsten 74	186 Re Rhenium 75	190 Os Osmium 76	192 I r Iridium 77	195 Pt Platinum 78	197 Au Gold	201 Hg Mercury	204 T 1 Thallium	207 Pb Lead		Po Polonium 84	At Astatine 85	Rn Radon 86
Francium 87	226 Ra Radium 88	Actinium †															
*58-71 L	*58-71 Lanthanoid series 190-103 Actinoid series	d series series		140 Ce	141 Pr	144 N d	Pm	150 Sm	152 Eu	157 Gd	159 Tb	162 Dy	165 Ho	167 Er	169 Tm	173 Yb	175 Lu

www.papaCambridge.com Hulium Thulium Mo **E**rbium Fm Es 2 ರ Terbium ਲ **Currium** gq **Eu** Europium Am Pu ž Ра **Serium** 232 **Th** 28 90 b = proton (atomic) number a = relative atomic mass X = atomic symbol 90-103 Actinoid series

Key

The volume of one mole of any gas is 24 dm³ at room temperature and pressure (r.t.p.).

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