

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS International General Certificate of Secondary Education

COMBINED SCIENCE 0653/01

Paper 1 Multiple Choice May/June 2008

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**.

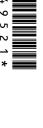
Choose the one you consider correct and record your choice in soft pencil on the separate Answer Sheet.

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.

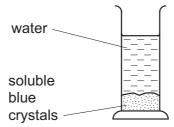
Any rough working should be done in this booklet.

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



International Examinations

- 1 Which part of a plant cell is formed from cellulose?
 - A cell surface membrane
 - B cell wall
 - **C** chloroplasts
 - **D** cytoplasm
- 2 An experiment is set up as shown.

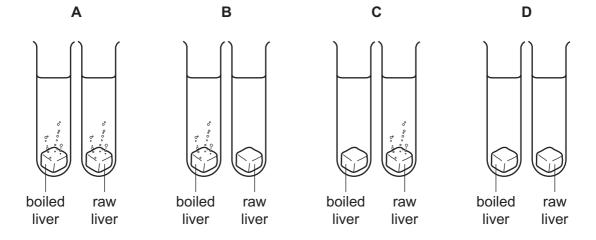


After several hours, the water turns blue.

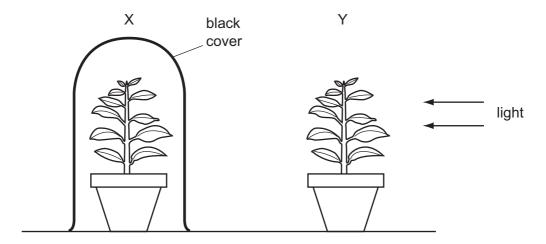
Which process causes this colour change to take place?

- A absorption
- **B** diffusion
- C digestion
- **D** evaporation
- **3** The enzyme catalase is found in liver cells. A cube of boiled liver and a cube of raw liver are added to solutions of hydrogen peroxide.

Which shows the result of this experiment?



- 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 The diagram shows two identical plants in different conditions.

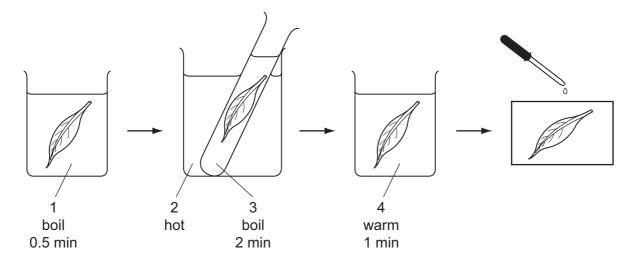


Which processes occur in plant X and in plant Y?

	Х		Y		
	photosynthesis	respiration	photosynthesis	respiration	
Α	√	X	✓	X	key
В	X	✓	✓	✓	✓ = process occurs
С	X	✓	✓	X	x = process does not occur
D	X	X	✓	✓	

- **6** The blockage of which blood vessel causes a heart attack?
 - **A** aorta
 - **B** coronary artery
 - **C** pulmonary artery
 - **D** pulmonary vein

7 The flow chart shows a green leaf being tested for the presence of starch.



What are substances 1, 2, 3 and 4?

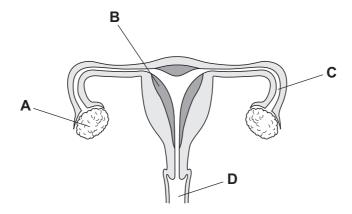
	1	2	3	4
Α	alcohol	water	iodine	water
В	water	alcohol	water	iodine
С	water	water	alcohol	iodine
D	water	water	alcohol	water

8 How does drinking alcohol affect the nervous system?

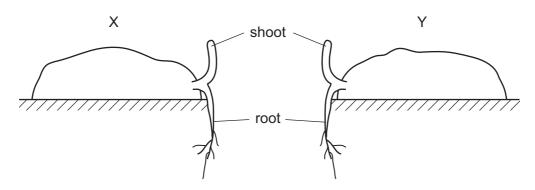
	time taken for impulse to pass from receptor to CNS	time taken for impulse to pass from CNS to effector
Α	decreases	decreases
В	decreases	increases
С	increases	decreases
D	increases	increases

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

Where is the fertilised ovum implanted?



10 A potato is cut into two portions, X and Y. Both portions produce shoots that grow into new plants.



Which statement about the two new plants is **not** true?

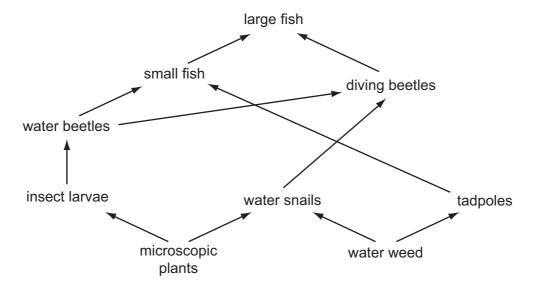
- A They are clones.
- **B** They come from different zygotes.
- **C** They contain identical genes in each cell.
- **D** They have the same parent.
- 11 Which type of variation can be inherited by offspring?

	variation caused by genes	variation caused by environment	
Α	✓	✓	key
В	✓	x	√ = variatior
С	×	✓	x = variation
D	X	X	

√ = variation can be inherited

x = variation cannot be inherited

12 The diagram shows a food web for a lake.

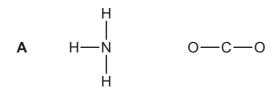


Which is a food chain from this web?

- **A** microscopic plants \rightarrow tadpoles \rightarrow small fish \rightarrow large fish
- **B** microscopic plants \rightarrow insect larvae \rightarrow water beetles \rightarrow tadpoles
- **C** microscopic plants \rightarrow water snails \rightarrow diving beetles \rightarrow large fish
- **D** microscopic plants \rightarrow water snails \rightarrow water weed \rightarrow tadpoles
- 13 Which procedure would reduce soil erosion?
 - A allowing large numbers of sheep to graze on grassland
 - **B** changing sloping farmland into terraced fields
 - C cutting down rainforests for agricultural use
 - **D** reducing the number of trees on hillsides
- 14 Which method of separation can be used to obtain pure water from aqueous potassium chloride?
 - **A** chromatography
 - **B** crystallisation
 - **C** distillation
 - **D** filtration

15 Which diagrams correctly show the displayed formula of ammonia and of carbon dioxide?

carbon dioxide



ammonia

16 The numbers of neutrons and protons present in the nuclei of four atoms are shown.

atom	number of neutrons	number of protons
1	11	12
2	12	11
3	13	13
4	13	11

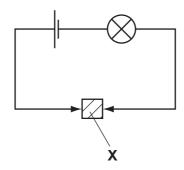
Which two atoms are of the same element?

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

17 How many atoms are present in each of the molecules of the following components in air?

	nitrogen	noble gases	oxygen	water vapour
Α	1	1	1	2
В	2	1	2	3
С	2	2	2	2
D	2	2	2	3

18 A solid **X** is placed in the circuit shown. The lamp lights.



What could solid X be?

	steel	graphite
Α	✓	✓
В	✓	x
С	x	✓
D	X	X

19 Which metal reacts dangerously when added to dilute sulphuric acid?

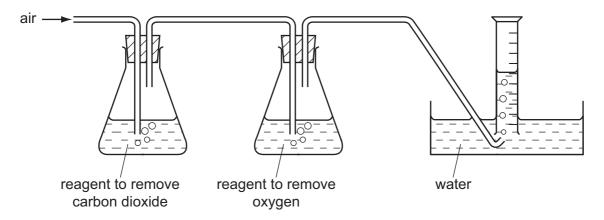
- A copper
- **B** magnesium
- C sodium
- **D** zinc

20 The diagram shows a razor used in shaving.



Why is the razor made of stainless steel and **not** pure iron?

- **A** It is a compound but iron is an element.
- **B** It is easier to polish than is iron.
- **C** It is more brittle than iron.
- **D** It is more resistant to rusting than is iron.
- 21 The diagram shows an experiment on the composition of air.



The volume of the air that passes into the apparatus is 100 cm³.

What is the volume and the composition of the gas collected in the measuring cylinder?

	volume/cm ³	composition
Α	20	pure nitrogen
В	20	nitrogen and other gases
С	80	pure nitrogen
D	80	nitrogen and other gases

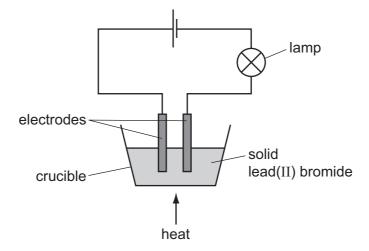
22 Which aqueous reagents give a white precipitate when added to aqueous zinc chloride?

	sodium hydroxide	barium nitrate	silver nitrate
Α	✓	✓	✓
В	✓	✓	X
С	✓	X	✓
D	X	✓	✓

23 Some calcium carbonate and hydrochloric acid start to react. Water is then added to the reaction mixture.

What happens to the speed of the reaction?

- A It decreases.
- B It increases.
- C It stays the same.
- **D** It stops.
- 24 The apparatus shown is set up.



The crucible needs to be heated for the bulb to give out light.

Why is heat needed?

- A An exothermic reaction takes place in the crucible.
- **B** Electrodes only conduct electricity when hot.
- **C** Heat causes the lead(II) bromide to react with air.
- **D** The lead(II) bromide has to be melted.

25 Crude oil (petroleum) is a source of hydrocarbon fuels.

Other fuels are coal and wood.

Are coal, wood and crude oil described as 'fossil fuels'?

	coal	wood	crude oil
Α	yes	yes	no
В	yes	no	yes
С	no	yes	yes
D	yes	yes	yes

- 26 Why is water often used to extinguish fires?
 - **A** The boiling point of water is 100 °C
 - **B** Water is a compound containing oxygen and hydrogen.
 - **C** Water removes heat from the fire.
 - **D** Water reacts with most fuels.
- 27 The sentence about making long chain molecules is incomplete.

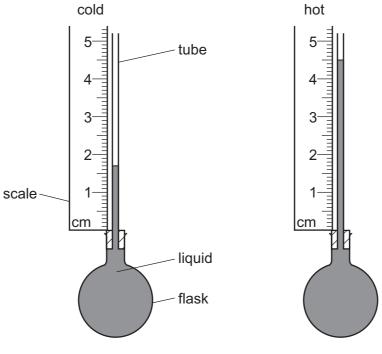
When a \dots number of molecules called \dots combine, the larger molecule formed is a \dots 3......

Which words correctly complete gaps 1, 2 and 3?

	1	2	3
Α	large	monomers	polymer
В	large	polymers	monomer
С	small	monomers	polymer
D	small	polymers	monomer

28 Some liquid is heated in a flask.

The diagrams show the height of the liquid in the tube when the liquid is cold and when it is hot.

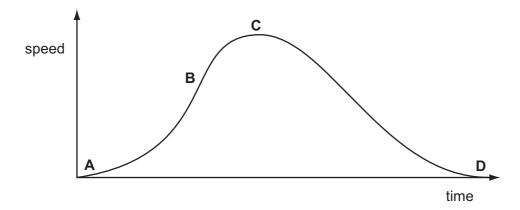


What is the difference in the heights?

- **A** 1.7 cm
- **B** 2.8 cm
- **C** 3.2 cm
- **D** 4.5 cm

29 The speed-time graph shown is for a bus travelling between stops.

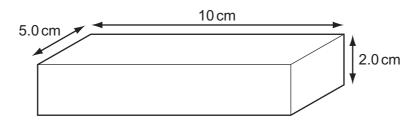
Where on the graph is the acceleration of the bus the greatest?



30 The circuit of a motor racing track is 3 km in length. In a race, a car goes 25 times round the circuit in 30 minutes.

What is the average speed of the car?

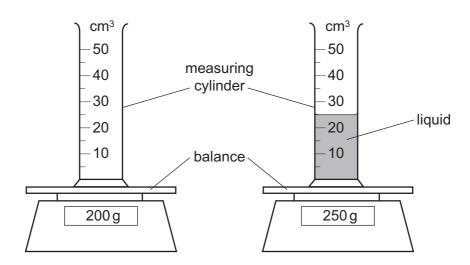
- A 75 km/hour
- **B** 90 km/hour
- C 150 km/hour
- D 750 km/hour
- 31 The diagram shows a rectangular metal block measuring $10\,\text{cm}\times5.0\,\text{cm}\times2.0\,\text{cm}$.



Its mass is 250 g.

What is the density of the metal?

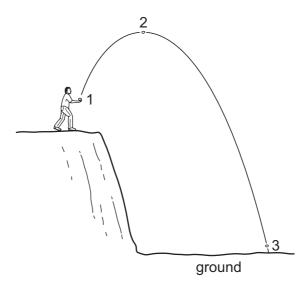
- **A** $0.20 \,\mathrm{g/cm^3}$
- **B** 0.40 g/cm³
- \mathbf{C} 2.5 g/cm³
- D 5.0 g/cm³
- **32** The diagram shows an experiment to find the density of a liquid.



What is the density of the liquid?

- $\mathbf{A} \quad 0.5\,\mathrm{g/cm^3}$
- \mathbf{B} 2.0 g/cm³
- \mathbf{C} 8.0 g/cm³
- **D** $10.0 \,\mathrm{g/cm^3}$

33 A stone is thrown from the edge of a cliff. Its path is shown in the diagram.

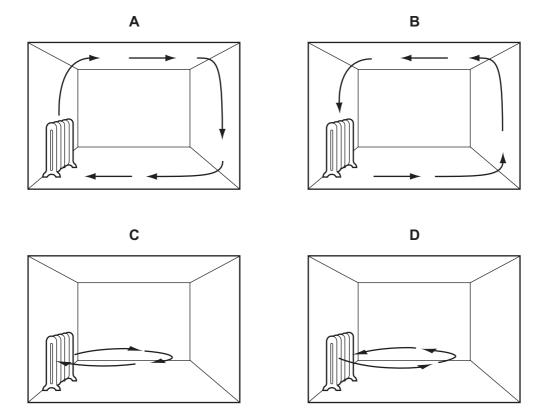


In which position does the stone have its greatest kinetic energy and in which position does it have its lowest potential energy?

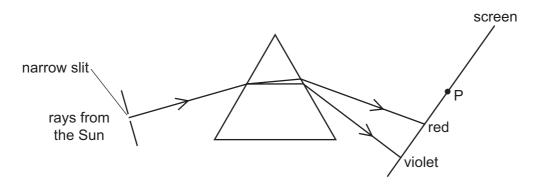
	greatest kinetic energy	lowest potential energy
Α	1	2
В	2	3
С	3	1
D	3	3

34 A heater is placed in a room.

Which diagram shows the movement of air as the room is heated?



35 Rays from the Sun pass through a prism and a spectrum is produced on a screen.

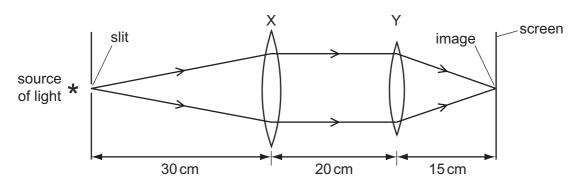


A thermometer placed at P shows a large temperature rise.

Which type of radiation causes this?

- A infra-red
- **B** microwave
- **C** ultra-violet
- D visible light

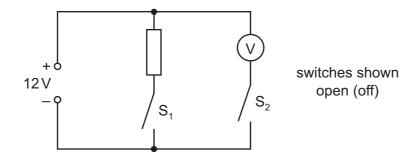
36 Two thin converging lenses, X and Y, are used as shown to give a focused image of an illuminated slit. The rays shown are parallel between X and Y.



What are the correct values for the focal lengths of X and of Y?

	focal length of X/cm	focal length of Y/cm			
Α	50	35			
В	30	20			
С	30	15			
D	20	20			

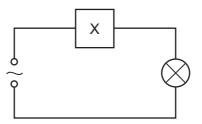
37 In the circuit shown, the switches S_1 and S_2 may be open (off) or closed (on).



Which line in the table shows the voltmeter reading for the switch positions given?

S ₁		S ₂	voltmeter reading / V			
Α	open	open	12			
В	closed	closed	12			
С	open	closed	0			
D	closed	open	12			

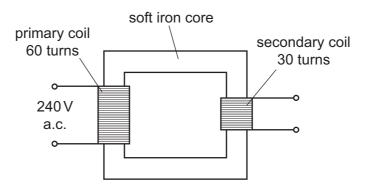
38 The device X in this circuit is designed to cut off the electricity supply if too much current flows.



What is device X?

- A a fuse
- **B** a relay
- C a resistor
- **D** an ammeter

39 The diagram shows a transformer connected to a 240 V a.c. supply.



What is the potential difference across the secondary coil of the transformer?

- **A** 30 V
- **B** 120 V
- **C** 240 V
- **D** 480 V

40 There are three types of emission from radioactive substances.

Which types carry an electric charge?

- A alpha-particles and beta-particles only
- B alpha-particles and gamma-rays only
- **C** beta-particles and gamma-rays only
- **D** all three types

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DATA SHEET
The Periodic Table of the Elements

Group	0	4 He Helium	20 Ne Neon	40 Ar Argon	84 Kr Krypton 36	131 Xe Xenon	Rn Radon 86		175 Lu Lutetium 71	Lr Lawrencium 103
	II/		19 F luorine	35.5 C1 Chlorine	80 Br Bromine 35	127 I lodine 53	At Astatine 85		Y b Ytterbium 70	Nobelium 102
	I		16 Oxygen 8	32 S Sulphur 16	79 Se Selenium 34	128 Te Tellurium	Po Polonium 84		169 Tm Thullum 69	Md Mendelevium 101
	>		14 N Nitrogen 7	31 P Phosphorus 15	75 As Arsenic 33	122 Sb Antimony 51	209 Bi Bismuth 83		167 Er Erbium 68	Fm Fermium 100
	>		12 C Carbon 6	28 Si Silicon	73 Ge Germanium	119 Sn Tin	207 Pb Lead		165 Ho Holmium 67	Es Einsteinium 99
	≡		11 Boron 5	27 A1 Aluminium 13	70 Ga Gallium 31	115 In Indium 49	204 T 1 Thallium 81		162 Dy Dysprosium 66	Cf Californium 98
					65 Zn Zinc 30	112 Cd Cadmium 48	201 Hg Mercury 80		159 Tb Terbium 65	BK Berkelium
					64 Cu Copper	108 Ag Siiver 47	197 Au Gold		157 Gd Gadolinium 64	Curium 96
					59 Nicke l Nickel 28	106 Pd Palladium	195 Pt Platinum 78		152 Eu Europium 63	Am Americium 95
					59 Co Cobalt	103 Rh Rhodium 45	192 Ir Iridium		150 Sm Samarium 62	Pu Plutonium 94
		T Hydrogen			56 Fe Iron 26	Ruthenium	190 Os Osmium 76		Pm Promethium 61	Neptunium
					Mn Manganese 25	Tc Technetium 43	186 Re Rhenium 75		144 Nd Neodymium 60	238 U Uranium 92
					52 Cr Chromium 24	96 Mo Molybdenum 42	184 W Tungsten 74		Pr Praseodymium 59	Pa Protactinium 91
					51 V Vanadium 23	93 Nb Niobium	181 Ta Tantalum 73		140 Ce Cerium	232 Th Thorium
					48 Ti Titanium 22	91 Zr Zirconium 40	178 Hf Hafnium 72		1	nic mass Ibol nic) number
					Scandium 21	89 ×	139 La Lanthanum 57 *	227 AC Actinium †	series eries	a = relative atomic mass X = atomic symbol b = proton (atomic) number
	=		9 Be Beryllium	24 Mg Magnesium	40 Ca Calcium 20	Sr Strontium	137 Ba Barium 56	226 Ra Radium 88	*58-71 Lanthanoid series	« × ∞
	_		7 L i Lithium	23 Na Sodium	39 K Potassium 19	85 Rb Rubidium 37	133 Cs Caesium 55	Fr Francium 87	*58-71 L	Key

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

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