



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education · October/November 2012

SUBJECT	CLASS	TIME ALLOWED	MAXIMUM MARKS
Combined Science 0653/11 · Paper 1 Multiple Choice	IGCSE	45 minutes	40

Name: _____ Date: _____

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.

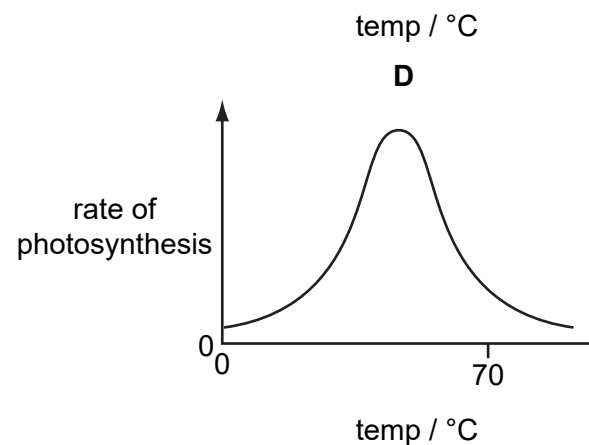
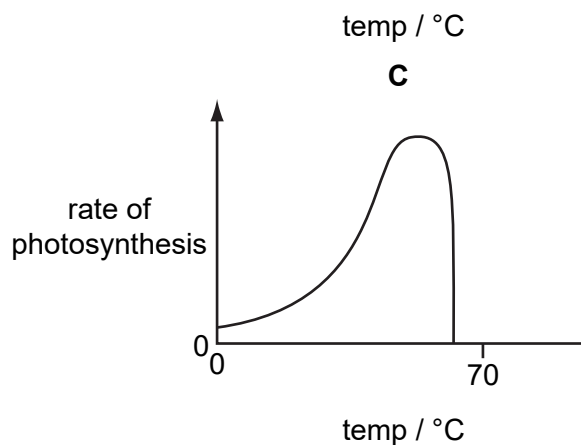
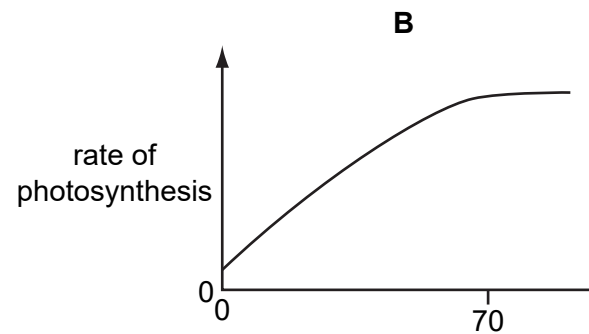
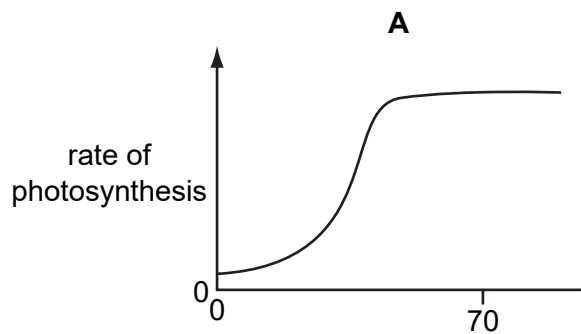
- 1 Water enters a plant cell. [1]
- In what order does the water pass through the cell structures before reaching the vacuole?
- A cell surface membrane → cell wall → cytoplasm
 - B cell wall → cell surface membrane → cytoplasm
 - C cell wall → cytoplasm → cell surface membrane
 - D cytoplasm → cell wall → cell surface membrane
- 2 What is diffusion? [1]
- A net movement of molecules down a concentration gradient
 - B net movement of molecules up a concentration gradient
 - C total movement of molecules down a concentration gradient
 - D total movement of molecules up a concentration gradient



- 3 The chemical reactions in photosynthesis depend on enzymes.

Which graph shows the effect of temperature on the rate of these reactions?

[1]



- 4 Water moves through the stomata of leaves during transpiration.

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

[1]

	direction	form
A	into the leaf	liquid
B	into the leaf	vapour
C	out of the leaf	liquid
D	out of the leaf	vapour

- 5 Which of these places parts of the alimentary canal in the order in which food passes through them?

[1]

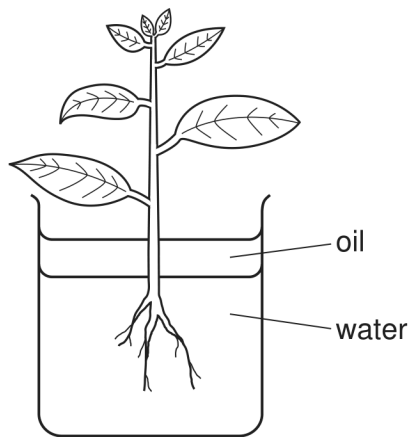
- A** oesophagus → colon → small intestine
- B** small intestine → oesophagus → rectum
- C** small intestine → rectum → anus
- D** stomach → colon → small intestine

- 6 Which part of blood contains haemoglobin?

[1]

- A** plasma
- B** platelets
- C** red blood cells
- D** white blood cells

- 7 The diagram shows a plant in a container of water. The layer of oil stops the water evaporating.



When set up, the apparatus weighs 296 g.
After two hours it weighs 292 g.

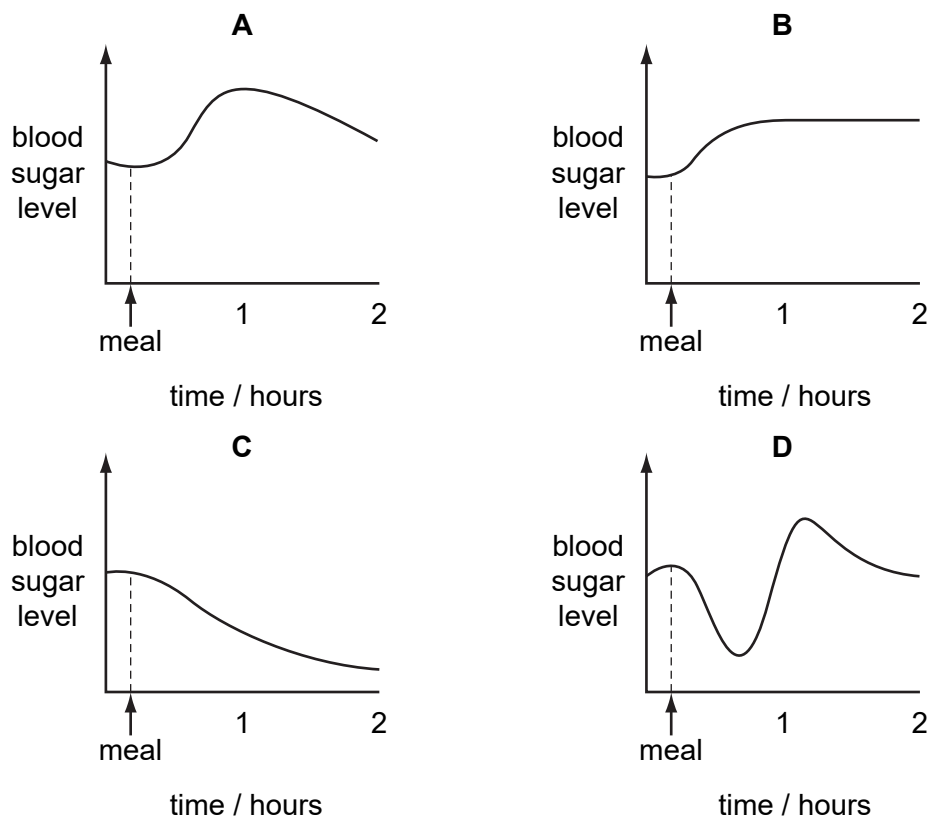
What is the rate of transpiration?

[1]

- A 150 g water / hour
- B 148 g water / hour
- C 4 g water / hour
- D 2 g water / hour

- 8 A person does not eat for several hours but then has a meal rich in carbohydrate.
Which graph shows how the person's blood sugar level changes after the meal?

[1]



- 9 It is possible to grow plants that are genetically identical.

What are plants grown in this way called?

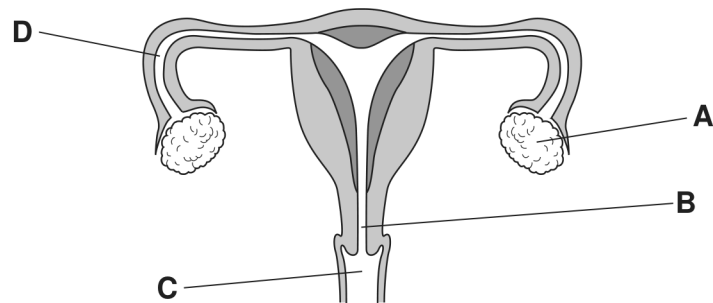
[1]

- A clones
- B gametes
- C seeds
- D zygotes

- 10 The diagram shows the human female reproductive system.

Where is the egg fertilised?

[1]

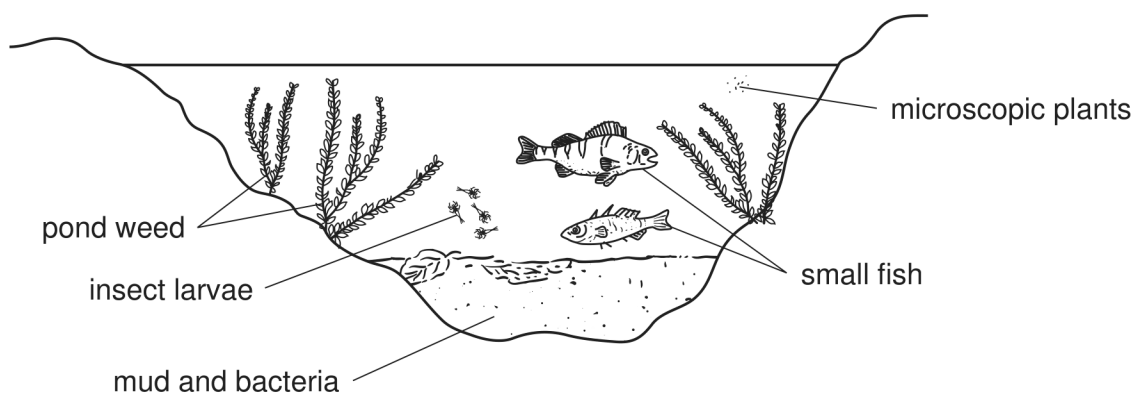


- 11 Which structures in flowers contain female gametes?

[1]

- A anthers
- B ovules
- C stamens
- D stigmas

- 12 The diagram shows the organisms in a pond.



Which is a food chain in this pond?

[1]

- A bacteria → pond weed → insect larvae → small fish
- B microscopic plants → insect larvae → small fish → bacteria
- C pond weed → small fish → bacteria → microscopic plants
- D small fish → insect larvae → microscopic plants → pond weed

13 Some of the gases present in the atmosphere are listed.

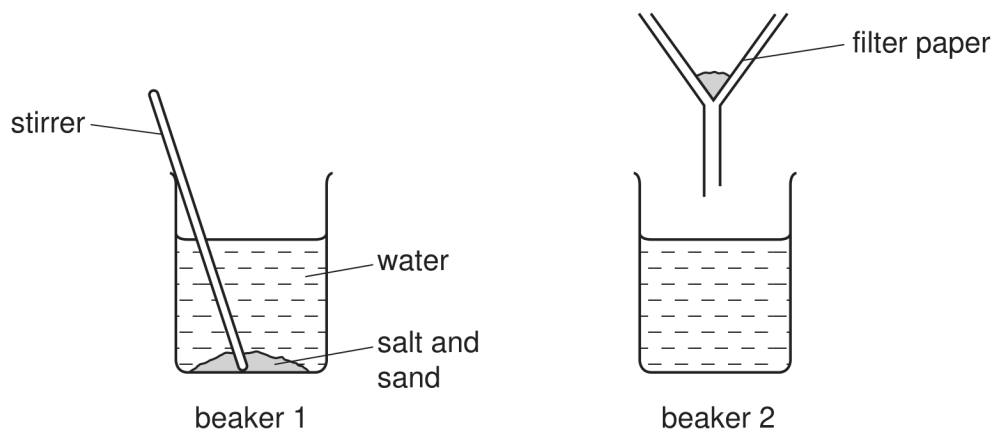
- 1 carbon dioxide
- 2 methane
- 3 nitrogen
- 4 oxygen

Which gases increase global warming when their levels in the atmosphere increase?

[1]

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

14 The apparatus shown is used to remove sand from a mixture of salt and sand.



The contents of beaker 1 are filtered.

What is obtained in beaker 2?

[1]

- A** a mixture of an element and a compound
B a mixture of two compounds
C one compound only
D one element only

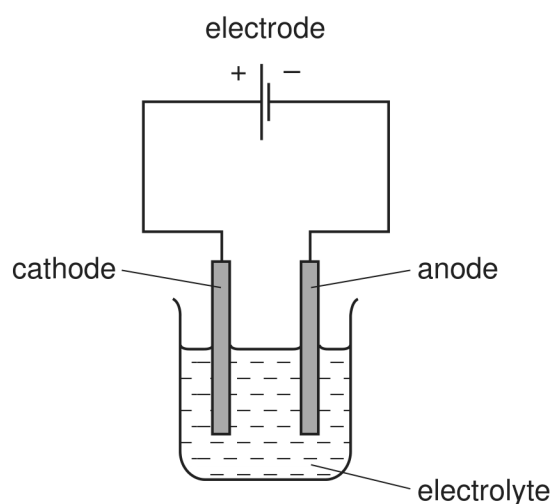
15 The electronic configurations of four elements are given.

Which element is found on the left-hand side of the Periodic Table?

[1]

- A** 2 **B** 2, 8, 7 **C** 2, 8, 8 **D** 2, 8, 8, 2

16 The diagram shows a simple cell.

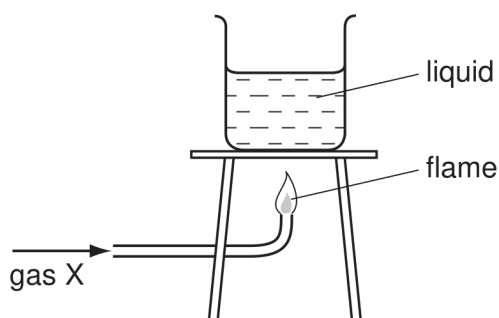


Which label on the diagram is correct?

[1]

- A anode
- B cathode
- C electrode
- D electrolyte

17 The diagram shows gas X burning and heating a liquid.

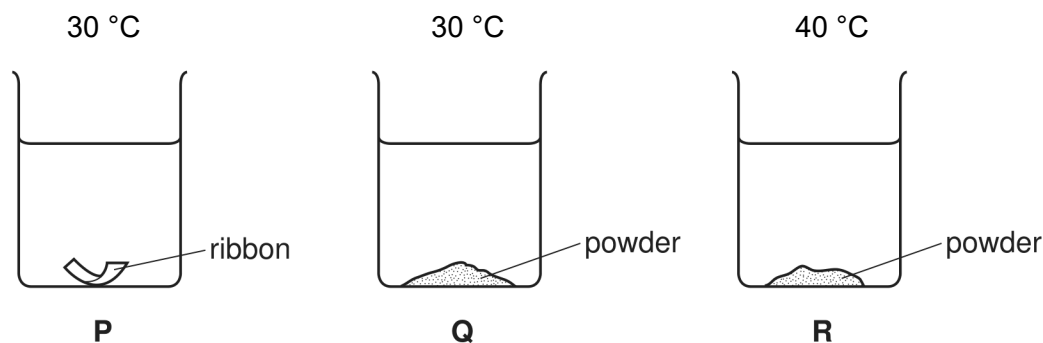


Which row is correct?

[1]

	gas X could be	the burning of gas X is exothermic
A	hydrogen	✓
B	hydrogen	X
C	oxygen	✓
D	oxygen	X

- 18 In the beakers, equal masses of magnesium are added to equal volumes of acid of the same concentration.

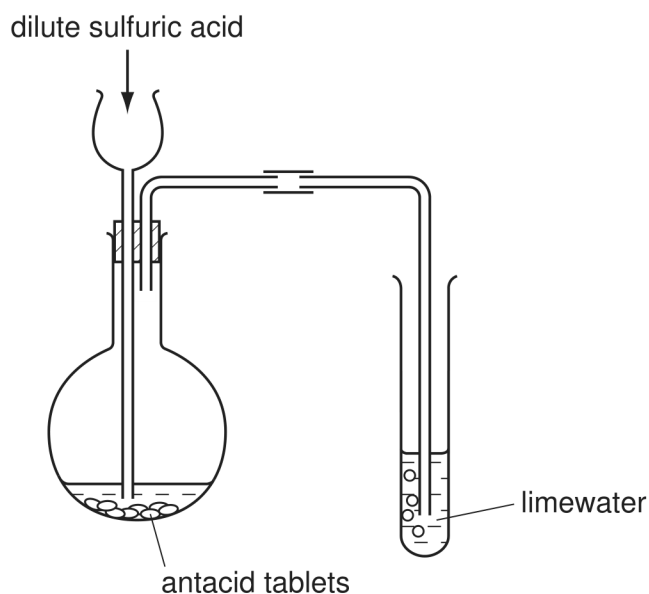


What is the order of the speed of reaction in the beakers?

[1]

	slowest	→	fastest
A	P	Q	R
B	P	R	Q
C	Q	P	R
D	Q	R	P

- 19 Dilute sulfuric acid is added to antacid tablets in the apparatus shown.



The limewater turns milky.

What does the experiment show these antacid tablets contain?

[1]

- A** magnesium
- B** magnesium carbonate
- C** magnesium hydroxide
- D** magnesium oxide



- 20 Which ion gives a white precipitate **both** with aqueous sodium hydroxide **and** with aqueous ammonia? [1]

A $\text{Cu}^{2+}(\text{aq})$ **B** $\text{Fe}^{2+}(\text{aq})$ **C** $\text{Fe}^{3+}(\text{aq})$ **D** $\text{Zn}^{2+}(\text{aq})$

- 21 The diagram shows an outline of the Periodic Table.
Which two elements have similar chemical properties? [1]

V																			
	X																W		
																	Y	Z	

A V and W **B** V and X **C** W and Y **D** Y and Z

- 22 The list shows different properties.

- 1 density
- 2 melting point
- 3 reactivity

Which properties show an increase for elements in Group VII as the group is descended? [1]

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

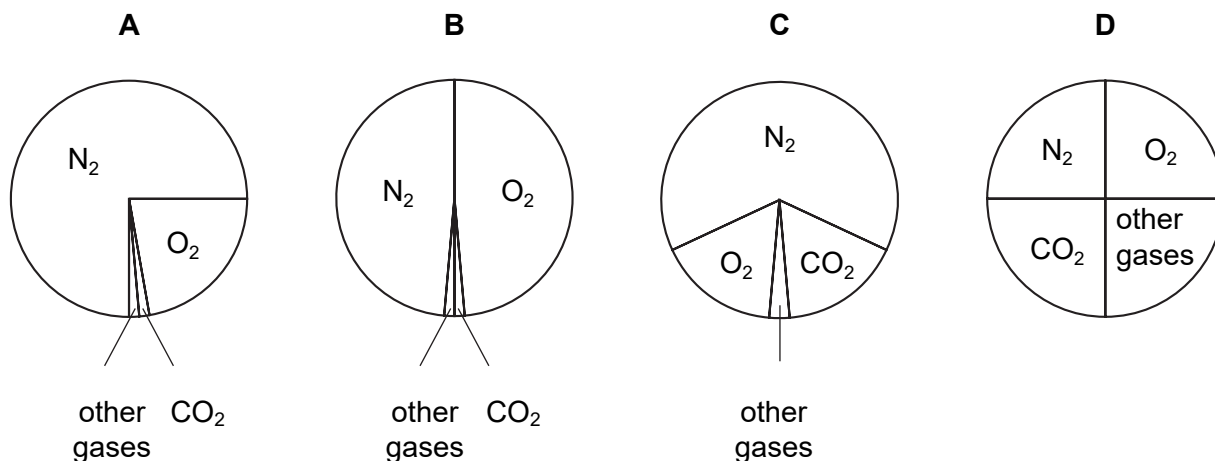
- 23 Platinite is a material used for parts of light bulbs. It is made by mixing iron and zinc.
Which type of substance is platinite? [1]

A alloy
B hydrocarbon
C ionic compound
D transition metal

- 24 Element X is unaffected by acids and is used in an alloy to make jewellery.
X is 1..... transition metal and the alloy is 2..... than the pure element.
Which words correctly complete gaps 1 and 2? [1]

	1	2
A	an unreactive	harder
B	an unreactive	softer
C	a reactive	harder
D	a reactive	softer

25 Which pie chart correctly shows the proportions of gases in the air? [1]



26 A hydrocarbon fuel is burned completely.



What are X and Y? [1]

	X	Y
A	CO	H ₂
B	CO	H ₂ O
C	CO ₂	H ₂
D	CO ₂	H ₂ O

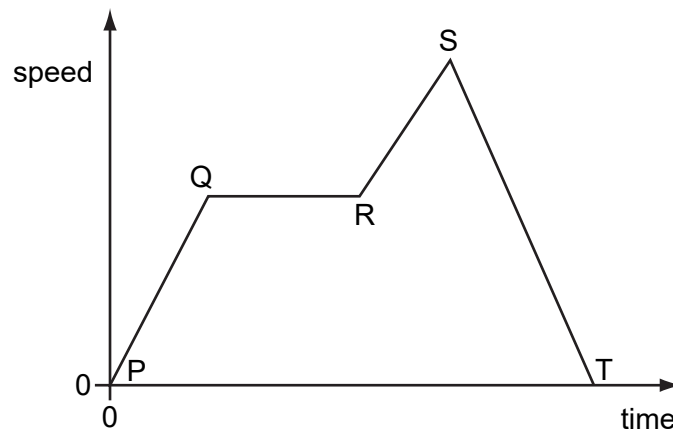
27 Petroleum is a source of hydrocarbon fuels.

Other fuels are coal and wood.

Which of these are fossil fuels? [1]

	coal	wood	petroleum
A	yes	yes	no
B	yes	no	yes
C	no	yes	yes
D	yes	yes	yes

- 28 The diagram is a speed / time graph for a car travelling along a city street.

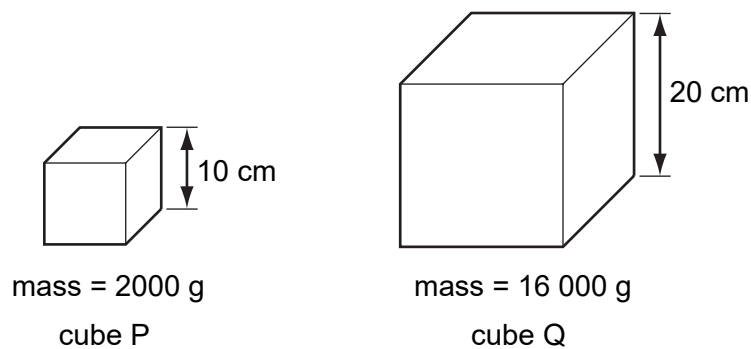


Where on the graph is the car moving with changing speed?

[1]

- A PQ, QR, RS and ST
- B PQ, RS and ST only
- C PQ and RS only
- D QR only

- 29 The diagram shows two cubes P and Q. The lengths of their sides and their masses are given.



What is the density of the material of cube Q?

[1]

- A half that of cube P
- B the same as that of cube P
- C twice that of cube P
- D four times that of cube P

- 30 What is the unit of work?

[1]

- A joule
- B kilogram
- C newton
- D watt

31 The melting point of water is 0°C and the boiling point of water is 100°C .

Which statement about water is correct?

[1]

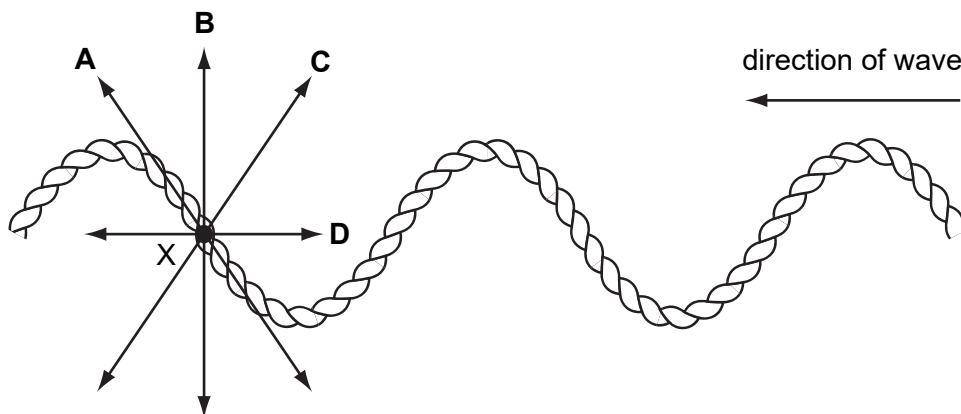
- A** At 100°C boiling occurs throughout the water.
- B** Between 0°C and 100°C the lowest energy molecules escape.
- C** Between 0°C and 100°C water does not evaporate.
- D** Ice only melts when its temperature is above 0°C .

32 In which state(s) of matter can convection occur?

[1]

- A** solids and liquids
- B** solids and gases
- C** liquids and gases
- D** liquids only

33 A wave is sent along a rope in the direction shown in the diagram.



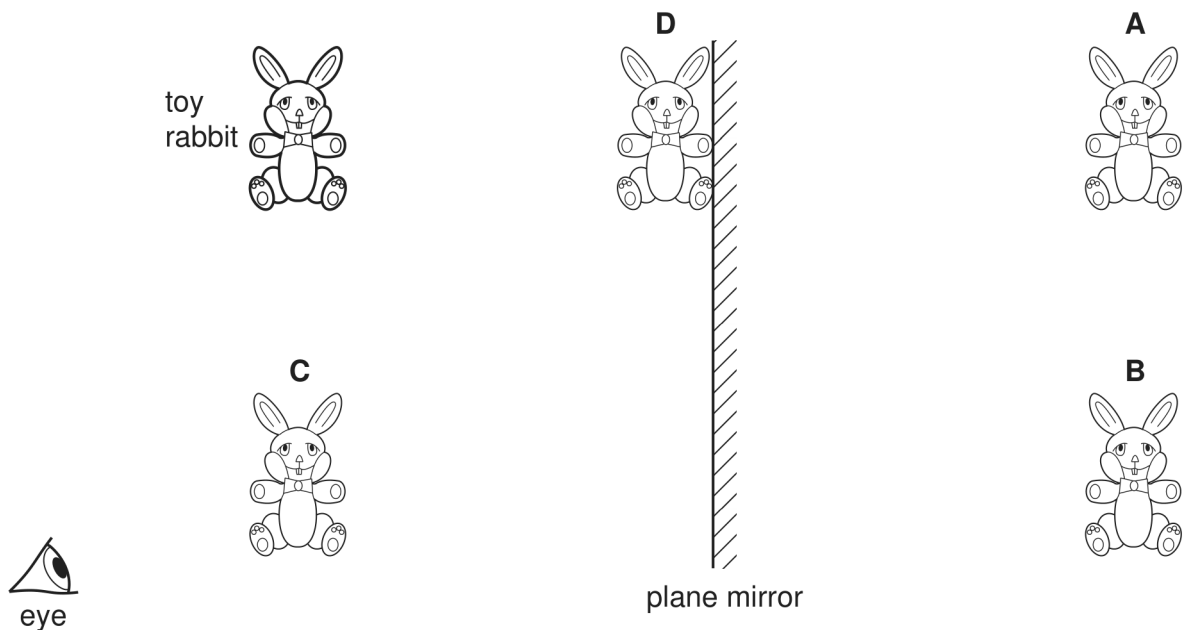
Which arrow shows the direction of vibration of the rope at point X?

[1]

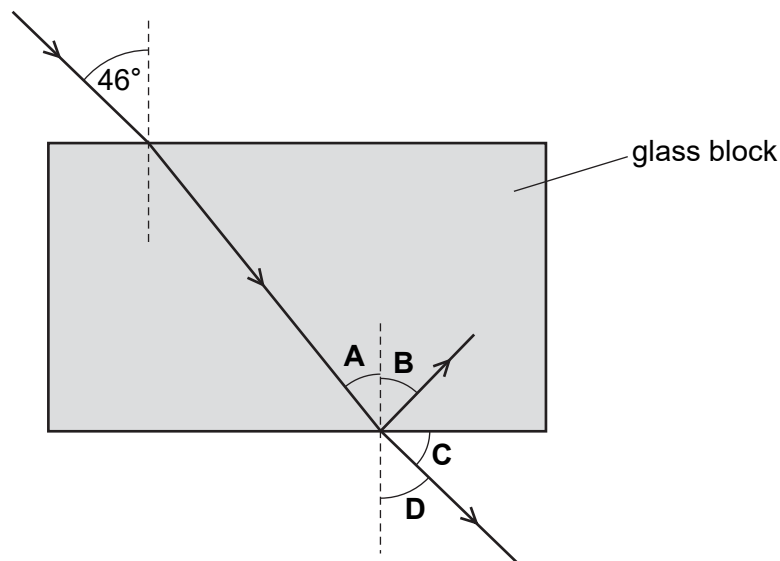
34 The diagram shows the position of the eye of a person looking at the reflection of a toy rabbit in a plane mirror.

At which position is the image seen?

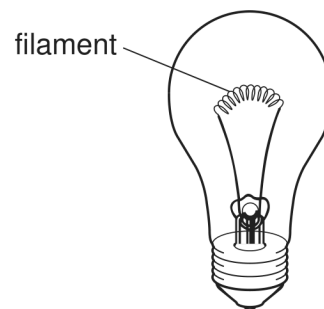
[1]



- 35** A ray of light strikes one face of a parallel-sided glass block. The angle of incidence is 46° . At the opposite face, part of the ray is reflected and part is refracted into the air. Which other angle has a value of 46° ? [1]



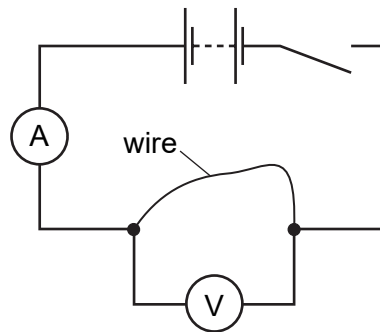
- 36** The diagram shows a filament lamp.



What are the main types of wave given out by the filament once the lamp is lit? [1]

- A** visible light and infra-red
 - B** visible light and microwaves
 - C** visible light and radio
 - D** visible light and ultraviolet
- 37** A starting pistol is fired. An echo from a wall 150 m away is heard one second later. What is the speed of sound calculated from these results? [1]
- A** 75 m / s **B** 150 m / s **C** 225 m / s **D** 300 m / s

- 38** A student sets up a circuit to find the resistance of a length of wire.



When the switch is closed, the ammeter reads 2 A and the voltmeter reads 10 V.

What is the resistance of the length of wire?

[1]

- A** 0.2 Ω **B** 5 Ω **C** 8 Ω **D** 20 Ω

- 39** In an electrical circuit, what is the purpose of a fuse?

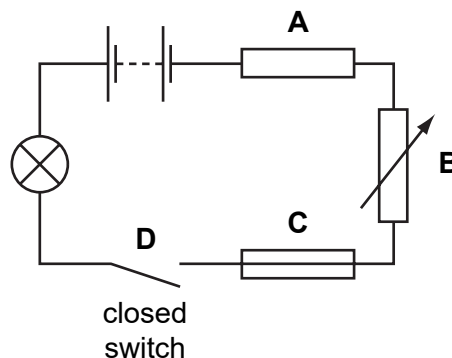
[1]

- A** to connect the metal case of an appliance to the earth
- B** to cut off the electrical supply if too much current flows
- C** to keep an electrical appliance dry in damp conditions
- D** to maintain a steady voltage as the current varies

- 40** When the switch in the circuit shown is closed, the lamp glows dimly.

Which component can be adjusted to make the lamp brighter?

[1]





DATA SHEET
The Periodic Table of the Elements

Group																				
I	II							III	IV	V	VI	VII	0							
1 H Hydrogen 1 7 Li Lithium 3 9 Be Beryllium 4 23 Na Sodium 11 39 K Potassium 19 85 Rb Rubidium 37 133 Cs Caesium 55 Fr Francium 87 45 Sc Scandium 21 89 Y Yttrium 39 139 La Lanthanum 57 227 Ac Actinium 89 †														11 B Boron 5 27 Al Aluminium 13 70 Ga Gallium 31 65 Zn Zinc 30 59 Ni Nickel 28 56 Fe Iron 26 55 Mn Manganese 25 52 Cr Chromium 24 51 V Vanadium 23 48 Ti Titanium 22 45 Sc Scandium 21	12 C Carbon 6 28 Si Silicon 14 73 Ge Germanium 32 64 Cu Copper 29 59 Ni Nickel 28 101 Ru Ruthenium 44 96 Tc Technetium 43 93 Nb Niobium 41 91 Zr Zirconium 40 89 Y Yttrium 39	14 N Nitrogen 7 31 P Phosphorus 15 75 As Arsenic 33 106 Pd Palladium 46 103 Rh Rhodium 45 101 Ru Ruthenium 44 96 Mo Molybdenum 42 93 Nb Niobium 41 91 Zr Zirconium 40 89 Y Yttrium 39	16 O Oxygen 8 32 S Sulfur 16 79 Se Selenium 34 64 Cu Copper 29 59 Co Cobalt 27 56 Fe Iron 26 55 Mn Manganese 25 52 Cr Chromium 24 51 V Vanadium 23 48 Ti Titanium 22 45 Sc Scandium 21	19 F Fluorine 9 35.5 Cl Chlorine 17 80 Br Bromine 35 108 Ag Silver 47 106 Pd Palladium 46 103 Rh Rhodium 45 101 Ru Ruthenium 44 96 Mo Molybdenum 42 93 Nb Niobium 41 91 Zr Zirconium 40 89 Y Yttrium 39	127 I Iodine 53 128 Te Tellurium 52 122 Sb Antimony 51 201 Hg Mercury 80 195 Pt Platinum 78 192 Ir Iridium 77 186 Re Rhenium 75 184 W Tungsten 74 181 Ta Tantalum 73 178 Hf Hafnium 72 139 La Lanthanum 57 227 Ac Actinium 89 †	86 Rn Radon 84 Po Polonium 83 Bi Bismuth 207 Pb Lead 81 Tl Thallium
58-71 Lanthanoid series														162 Dy Dysprosium 66 159 Tb Terbium 65 157 Gd Gadolinium 64 152 Eu Europium 63 150 Sm Samarium 62 144 Nd Neodymium 60 141 Pr Praseodymium 59 140 Ce Cerium 58	175 Lu Lutetium 71 169 Tm Thulium 69 167 Er Erbium 68 165 Ho Holmium 67 162 Dy Dysprosium 66 159 Tb Terbium 65 157 Gd Gadolinium 64 152 Eu Europium 63 150 Sm Samarium 62 144 Nd Neodymium 60 141 Pr Praseodymium 59 140 Ce Cerium 58	103 Lr Lawrencium 101 Md Mendelevium 100 Fm Fermium 99 Es Einsteinium 98 Cf Californium 97 Bk Berkelium 96 Cm Curium 95 Am Americum 94 Pu Plutonium 93 Np Neptunium 92 U Uranium 91 Pa Protactinium 90 Th Thorium				
Key														a X b a = relative atomic mass X= atomic symbol b = proton (atomic) number						

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

Key

a	X
b	X

a = relative atomic mass
X = atomic symbol
b = proton (atomic) number

*58-71 Lanthanoid series
†90-103 Actinoid series



University of Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.