



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

COMBINED SCIENCE

0653/11

Paper 1 Multiple Choice

October/November 2012

45 minutes

Additional Materials: Multiple Choice Answer Sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

* 7 0 8 3 3 7 1 5 9 9 *

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.

This document consists of **17** printed pages and **3** blank pages.



2

1 Water enters a plant cell.

In what order does the water pass through the cell structures before reaching the vacuole?

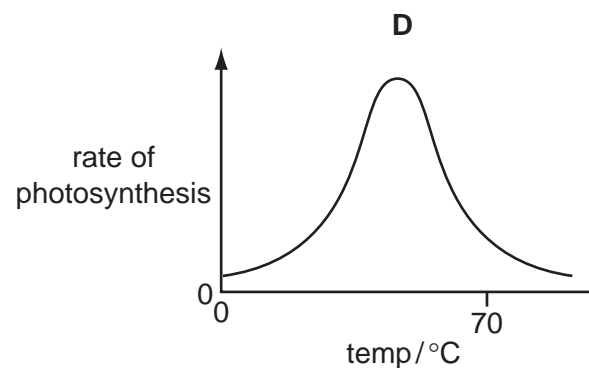
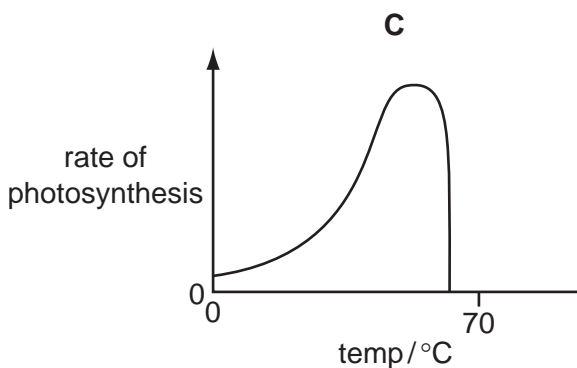
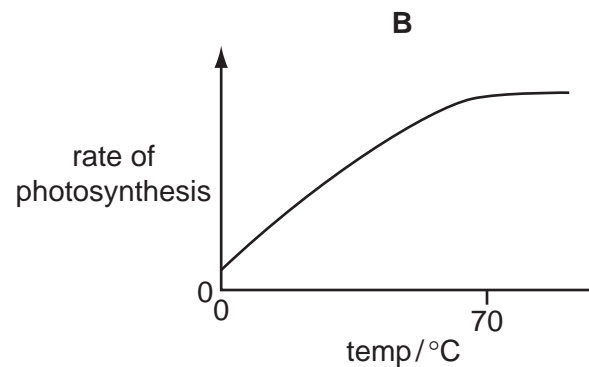
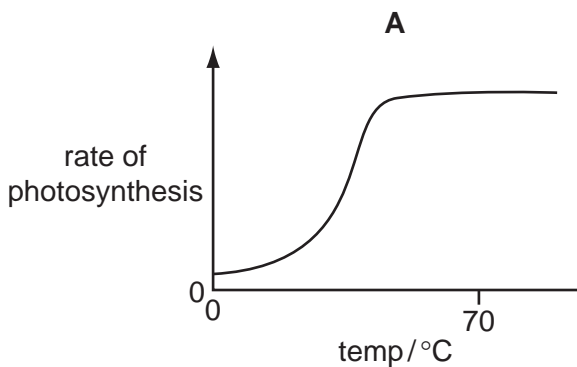
- A cell surface membrane → cell wall → cytoplasm
- B cell wall → cell surface membrane → cytoplasm
- C cell wall → cytoplasm → cell surface membrane
- D cytoplasm → cell wall → cell surface membrane

2 What is diffusion?

- 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?



3

4 Water moves through the stomata of leaves during transpiration.

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

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

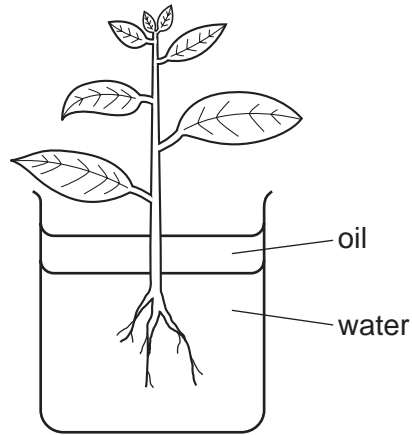
5 Which of these places parts of the alimentary canal in the order in which food passes through them?

- 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?

- 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 evaporation.

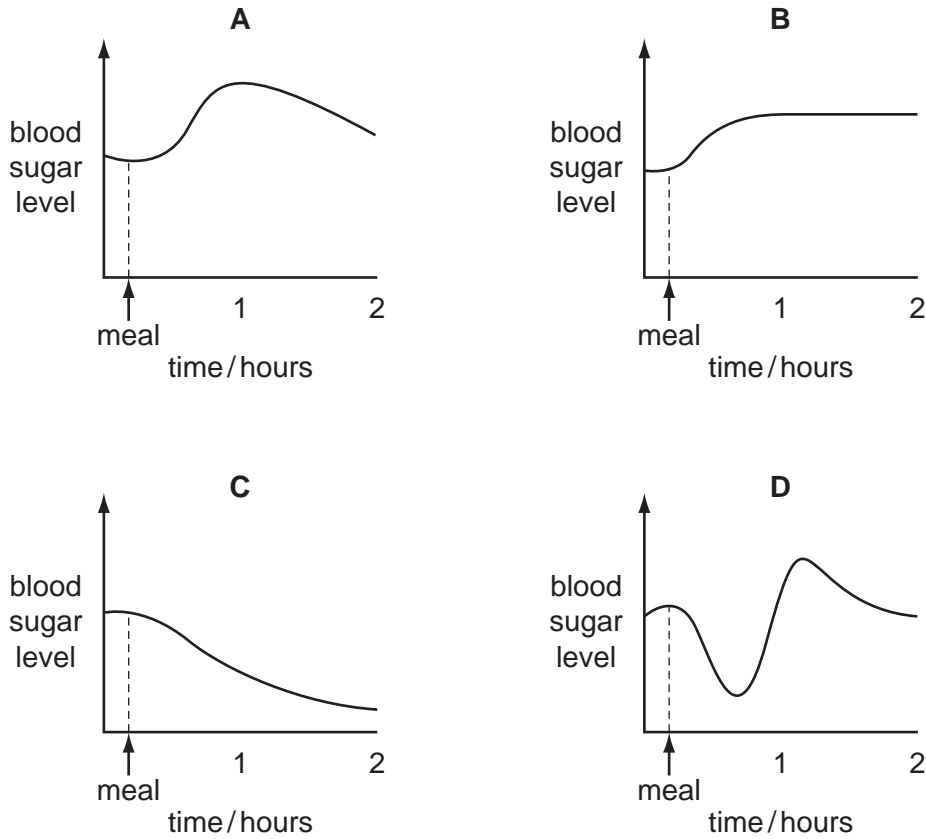


When set up, the apparatus weighs 296 g.
After two hours it weighs 292 g.

What is the rate of transpiration?

- 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?



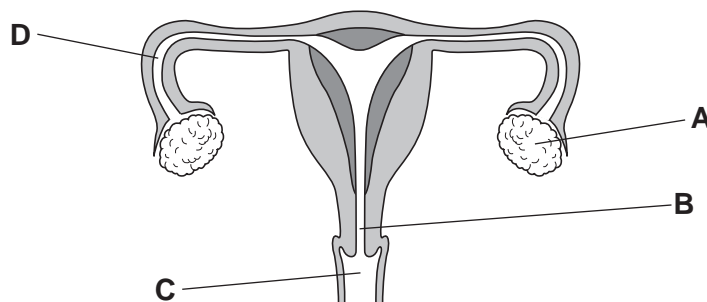
9 It is possible to grow plants that are genetically identical.

What are plants grown in this way called?

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

10 The diagram shows the human female reproductive system.

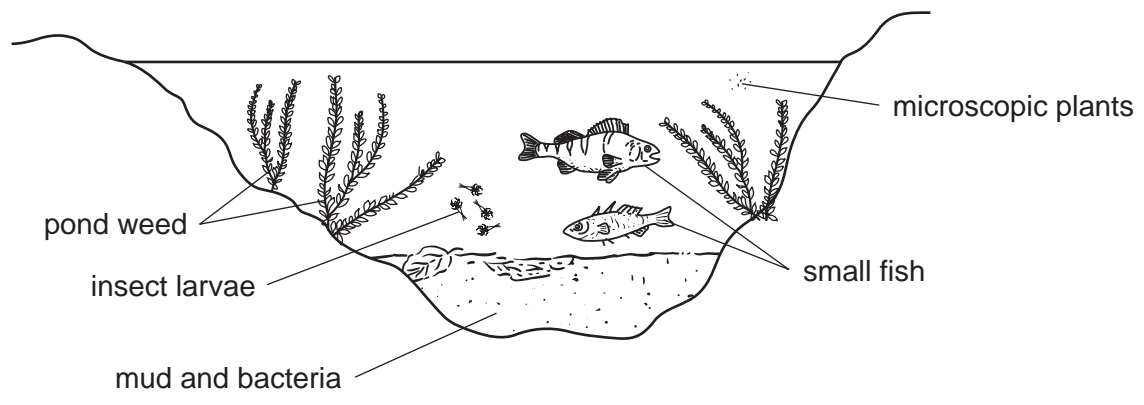
Where is the egg fertilised?



11 Which structures in flowers contain female gametes?

- 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?

- 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

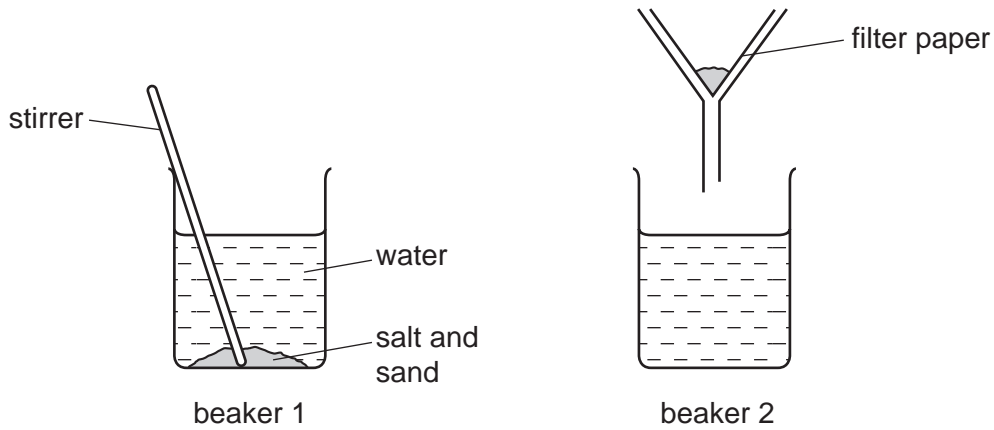
13 Some of the gases present in the atmosphere are listed.

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

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

- 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.

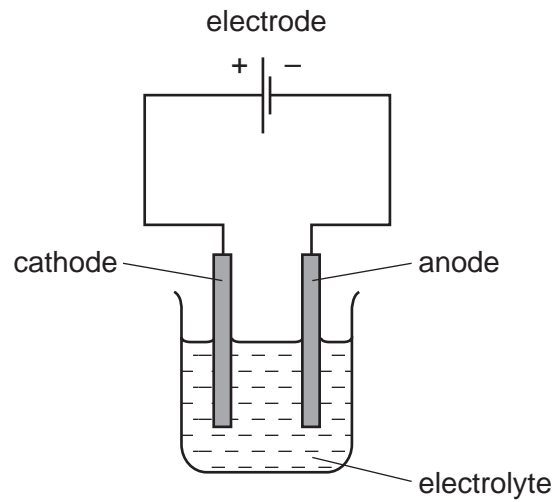


The contents of beaker 1 are filtered.

What is obtained in beaker 2?

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

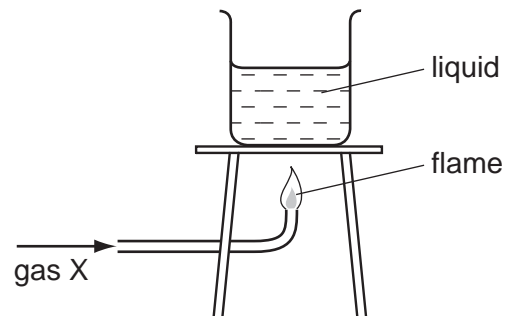
16 The diagram shows a simple cell.



Which label on the diagram is correct?

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

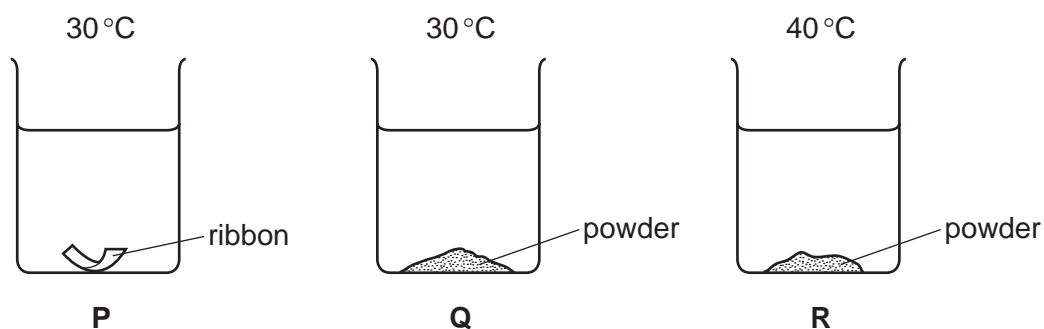
17 The diagram shows gas X burning and heating a liquid.



Which row is correct?

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

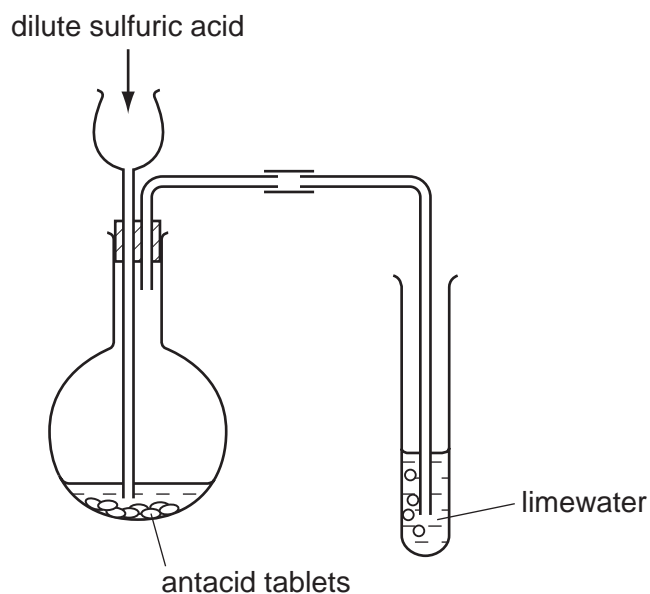
- 18 In the beakers, equal masses of magnesium are added to equal volumes of acid concentration.



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

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

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

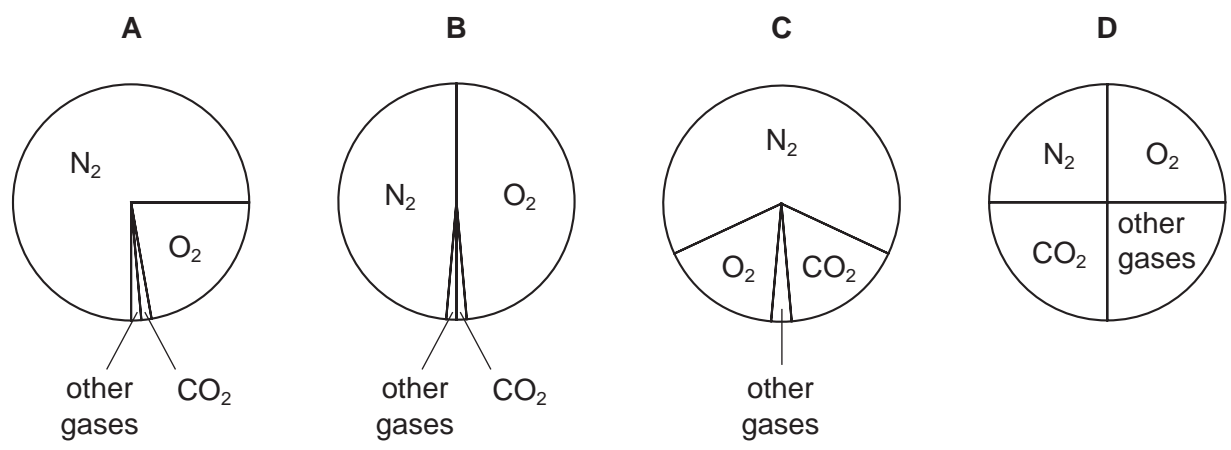
24 Element X is unaffected by acids and is used in an alloy to make jewellery.

X is1..... transition metal and the alloy is2..... than the pure element.

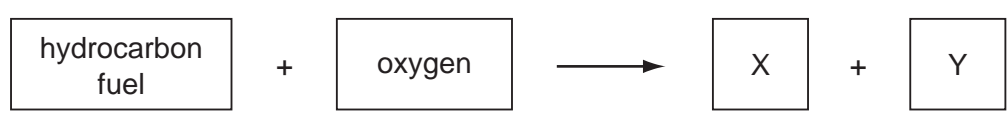
Which words correctly complete gaps 1 and 2?

	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?



26 A hydrocarbon fuel is burned completely.



What are X and Y?

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

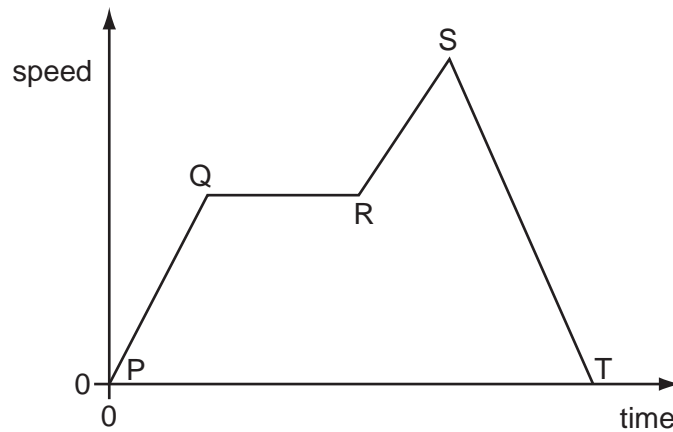
27 Petroleum is a source of hydrocarbon fuels.

Other fuels are coal and wood.

Which of these are fossil fuels?

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

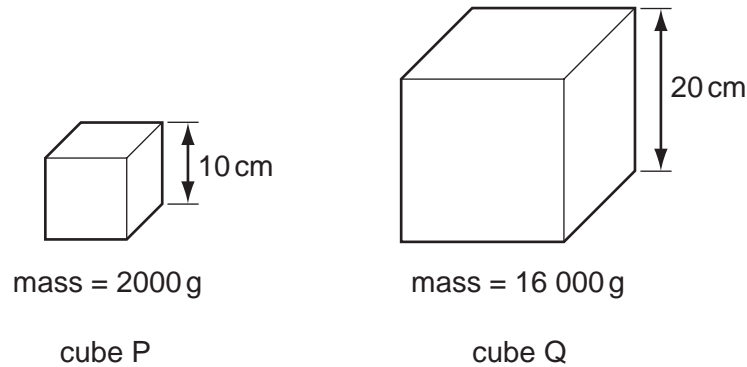
28 The diagram is a speed/time graph for a car travelling along a city street.



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

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

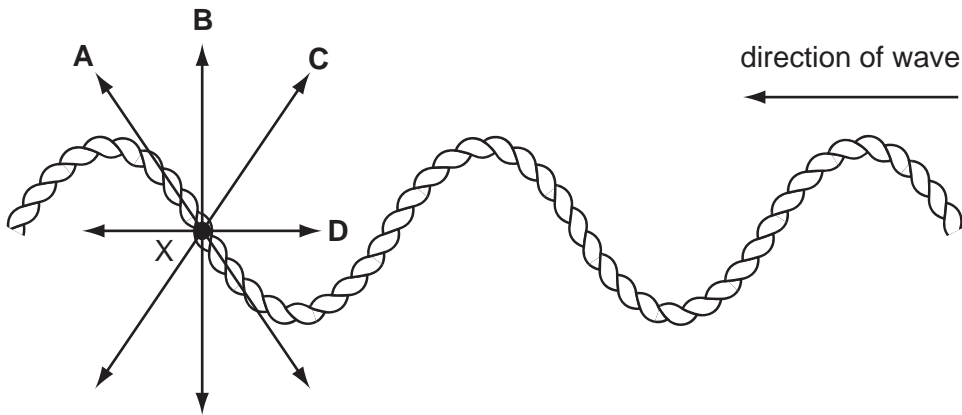
29 The diagram shows two cubes P and Q. The lengths of their sides and their masses are



What is the density of the material of cube Q?

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

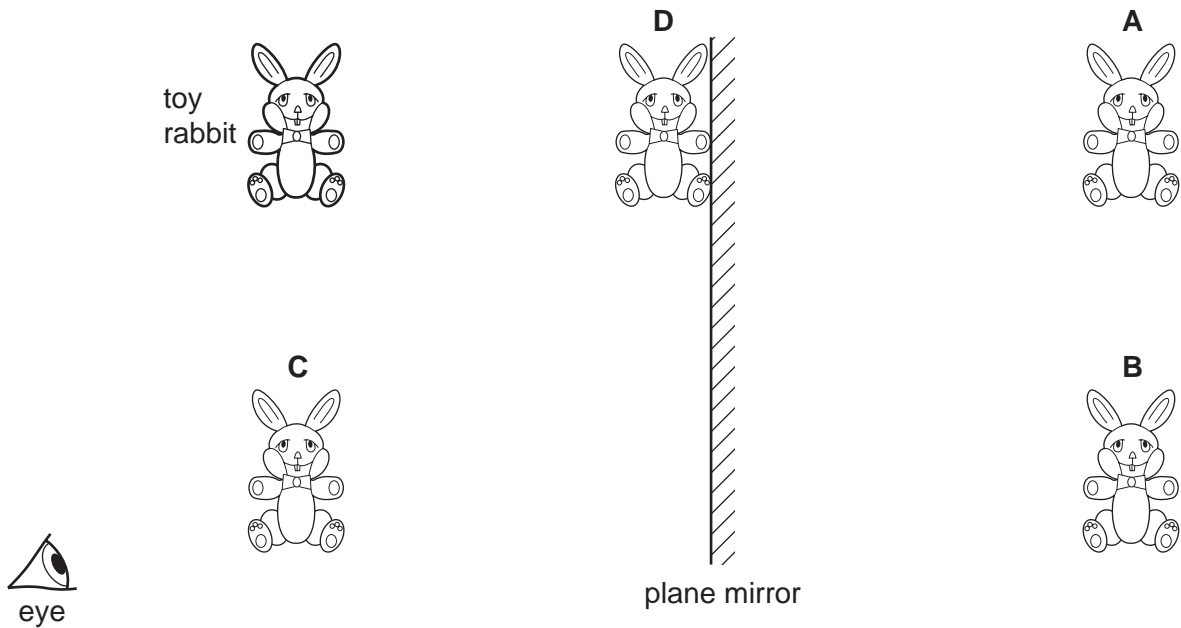
33 A wave is sent along a rope in the direction shown in the diagram.



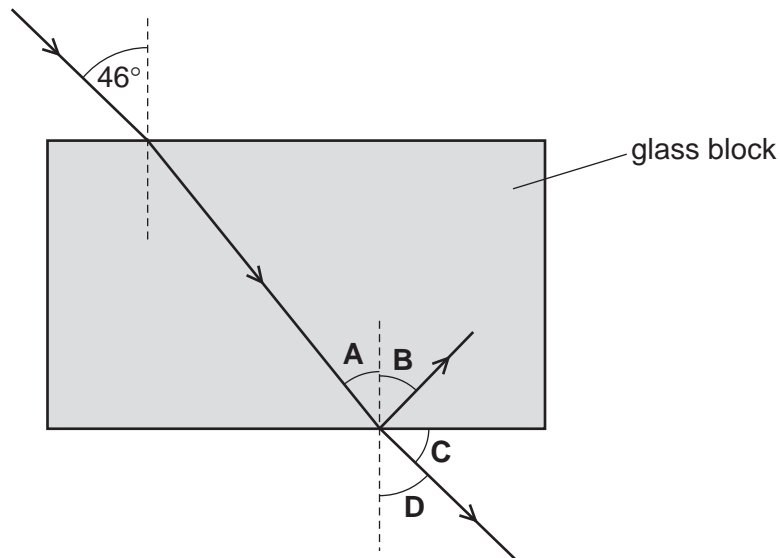
Which arrow shows the direction of vibration of the rope at point X?

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

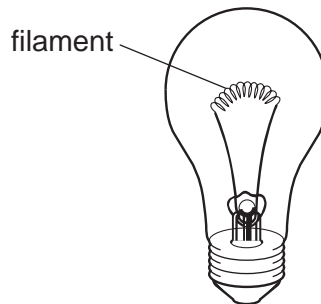
At which position is the image seen?



- 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° ?



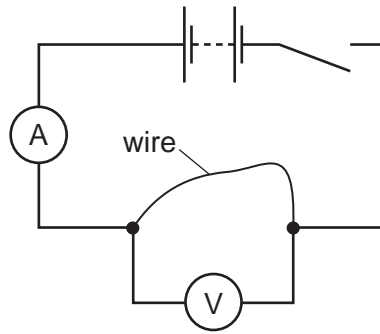
- 36 The diagram shows a filament lamp.



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

- 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?
- 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.

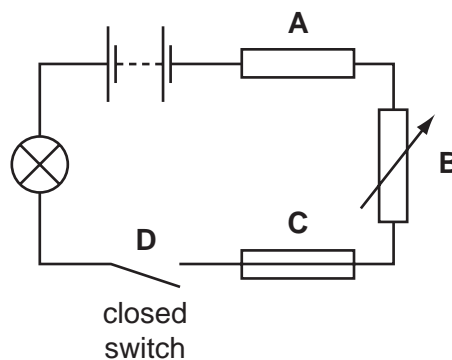


When the switch is closed, the ammeter reads 2A and the voltmeter reads 10V.

What is the resistance of the length of wire?

- A** $0.2\ \Omega$ **B** $5\ \Omega$ **C** $8\ \Omega$ **D** $20\ \Omega$
- 39 In an electrical circuit, what is the purpose of a fuse?
- 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?



DATA SHEET
The Periodic Table of the Elements

		Group																																					
		I	II	III	IV	V	VI	VII	0																														
		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">1</td> <td style="width: 10%; text-align: center;">H Hydrogen 1</td> <td colspan="8"></td> <td style="width: 10%; text-align: center;">2</td> <td style="width: 10%; text-align: center;">He Helium 4</td> </tr> </table>										1	H Hydrogen 1									2	He Helium 4																
1	H Hydrogen 1									2	He Helium 4																												
7	Li Lithium 3	9	Be Beryllium 4											19	F Fluorine 9	20	Ne Neon 10																						
23	Na Sodium 11	24	Mg Magnesium 12											35.5	Cl Chlorine 17	40	Ar Argon 18																						
39	K Potassium 19	40	Ca Calcium 20	45	Sc Scandium 21	48	Ti Titanium 22	51	V Vanadium 23	55	Mn Manganese 25	56	Fe Iron 26	59	Co Cobalt 27	59	Ni Nickel 28	64	Cu Copper 29	65	Zn Zinc 30	70	Ga Gallium 31	73	Ge Germanium 32	75	As Arsenic 33	79	Se Selenium 34	80	Br Bromine 35	84	Kr Krypton 36						
85	Rb Rubidium 37	88	Sr Strontium 38	89	Y Yttrium 39	91	Zr Zirconium 40	93	Nb Niobium 41	96	Mo Molybdenum 42	101	Ru Ruthenium 44	103	Rh Rhodium 45	106	Pd Palladium 46	108	Ag Silver 47	112	Cd Cadmium 48	115	In Indium 49	119	Sn Tin 50	122	Sb Antimony 51	128	Te Tellurium 52	127	I Iodine 53	131	Xe Xenon 54						
133	Cs Caesium 55	137	Ba Barium 56	139	La Lanthanum 57	178	Hf Hafnium 72	181	Ta Tantalum 73	184	W Tungsten 74	190	Os Osmium 76	192	Ir Iridium 77	195	Pt Platinum 78	197	Au Gold 79	201	Hg Mercury 80	204	Tl Thallium 81	207	Pb Lead 82	209	Bi Bismuth 83	210	Po Polonium 84	210	At Astatine 85	210	Rn Radon 86						
226	Ra Radium 88	227	Ac Actinium 89											140	Ce Cerium 58	141	Pr Praseodymium 59	144	Nd Neodymium 60	150	Sm Samarium 62	152	Eu Europium 63	157	Gd Gadolinium 64	159	Tb Terbium 65	162	Dy Dysprosium 66	165	Ho Holmium 67	167	Er Erbium 68	169	Tm Thulium 69	173	Yb Ytterbium 70	175	Lu Lutetium 71
87	Fr Francium											232	Th Thorium 90	238	U Uranium 92	238	Np Neptunium 93	238	Pu Plutonium 94	238	Am Americium 95	238	Cm Curium 96	238	Bk Berkelium 97	238	Cf Californium 98	238	Es Einsteinium 99	238	Fm Fermium 100	238	Md Mendelevium 101	238	No Nobelium 102	238	Lr Lawrencium 103		

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

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

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