



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

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COMBINED SCIENCE

5129/01

Paper 1 Multiple Choice

May/June 2008

1 hour

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

* 7 0 7 4 0 8 8 2 6 3 *

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.

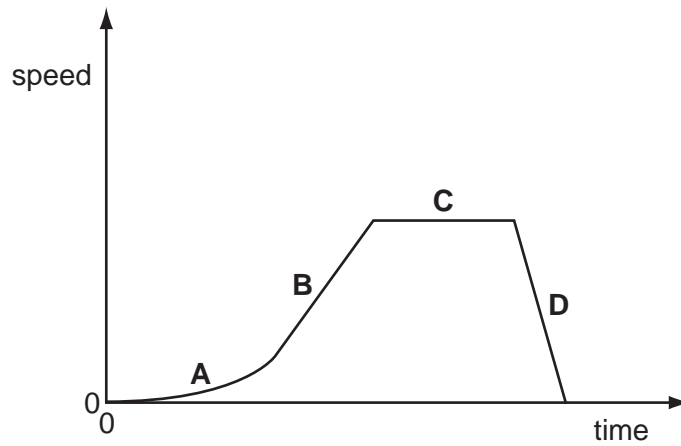
A copy of the Periodic Table is printed on page 20.

This document consists of **19** printed pages and **1** blank page.



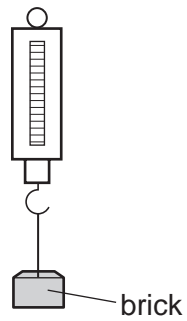
- 1 The diagram shows a speed-time graph for an object.

Which section of the graph shows this object moving with constant speed?

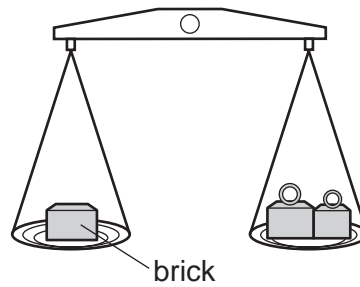


- 2 A brick is placed on a newton balance X and then on a beam balance Y.

balance X



balance Y

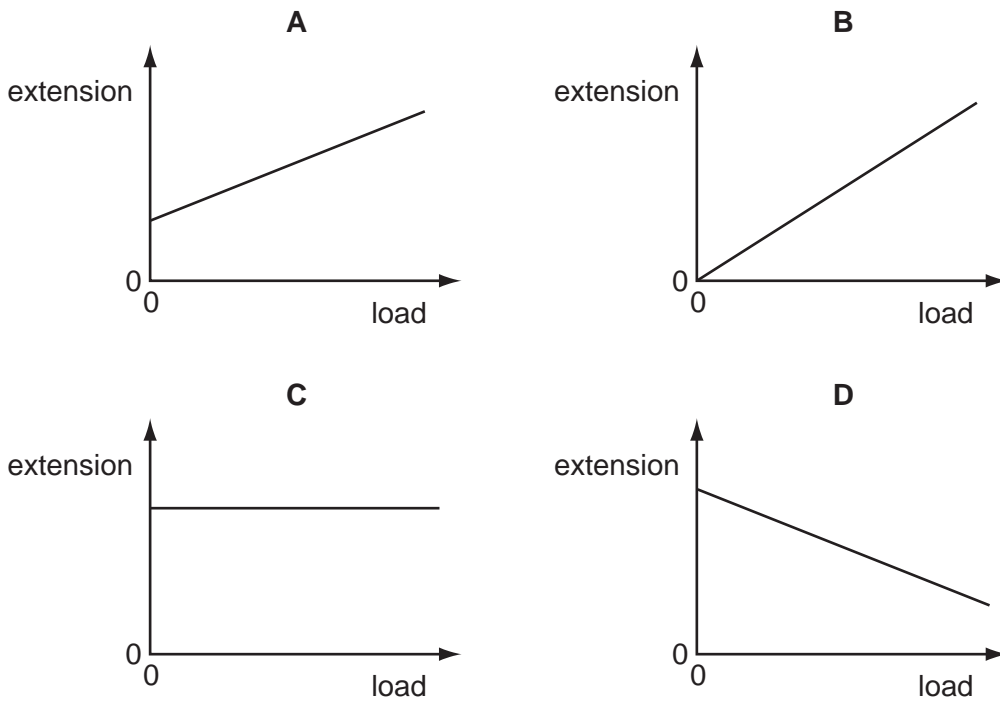


What is measured by each balance?

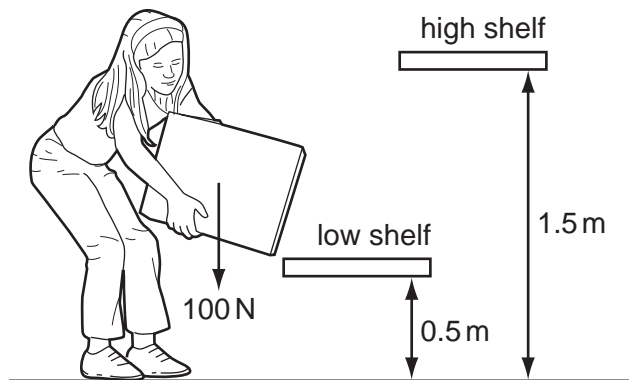
	balance X	balance Y
A	mass	mass
B	mass	weight
C	weight	mass
D	weight	weight

- 3 A student adds different loads to the end of a spring. She finds the extension in each case and plots a graph of extension against load.

Which is the correct graph?



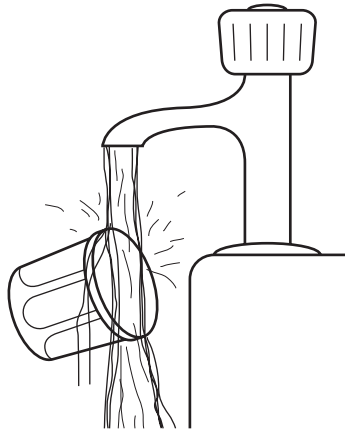
- 4 The diagram shows a girl lifting a box of weight 100 N from a low shelf to a high shelf.



How much work is done by the girl?

- A 50 J B 100 J C 150 J D 200 J

- 5 A person cannot unscrew the lid of a pot of jam. He finds that the metal lid can be removed after it has been held under hot, running water for a few seconds.



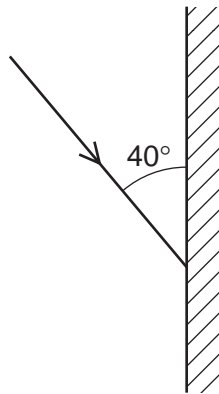
Why is this?

- A The air pressure in the jar falls.
 - B The glass expands.
 - C The jam melts.
 - D The metal lid expands.
- 6 A wave has a frequency of 30 000 Hz and a speed of 1500 m/s.

What is the wavelength?

- A 0.05 m
- B 0.50 m
- C 20 m
- D 200 m

- 7 The diagram shows a single ray of light being directed at a plane mirror.



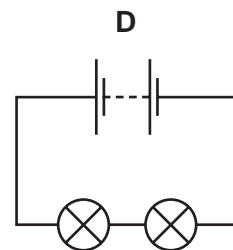
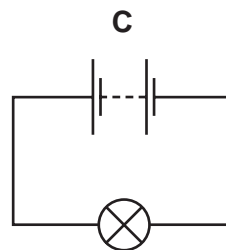
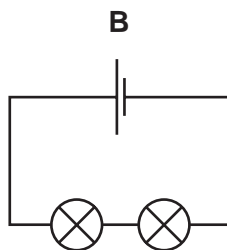
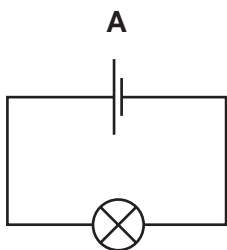
What are the angles of incidence and reflection?

	angle of incidence	angle of reflection
A	40°	40°
B	40°	50°
C	50°	40°
D	50°	50°

- 8 An electric current in a metal wire involves the movement of

- A** atoms.
- B** electrons.
- C** molecules.
- D** protons.

- 9 Which circuit contains the brightest lamp?

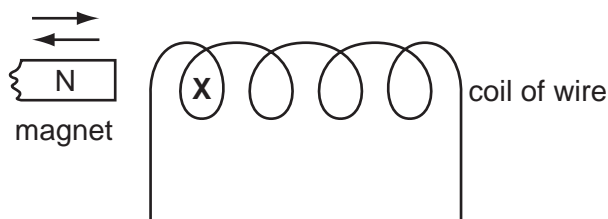


- 10 A potential difference of 4 V drives a current of 3 A through a resistor.

How much electrical energy is converted into heat during 10 s?

- A** 12 J
- B** 30 J
- C** 40 J
- D** 120 J

- 11 The diagram shows the north pole of a magnet moved into, and out of, a coil of wire.



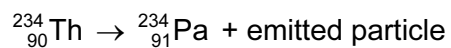
What describes the poles produced in the coil at **X** by the movement of the magnet?

	north pole in	north pole out
A	N	N
B	N	S
C	S	N
D	S	S

- 12 A nuclide of the element plutonium is ${}^{242}_{94}\text{Pu}$.

What is the number of neutrons in its nucleus?

- A** 336 **B** 242 **C** 148 **D** 94
- 13 The radioactive decay of a nuclide is represented by the equation below.



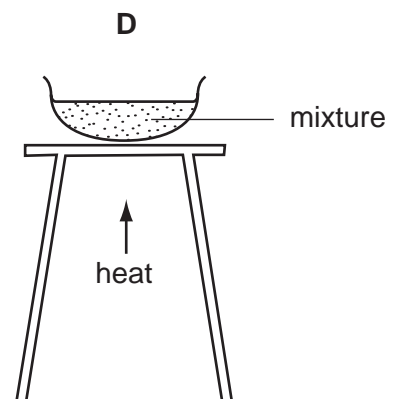
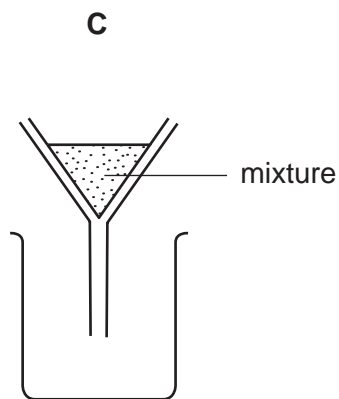
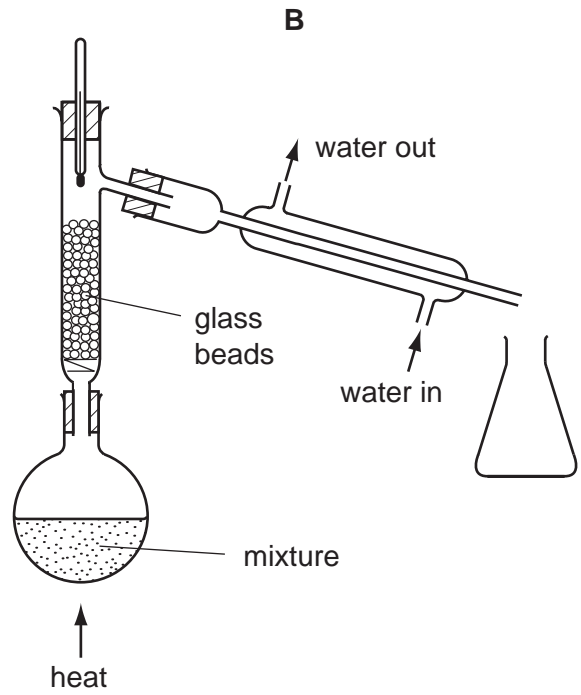
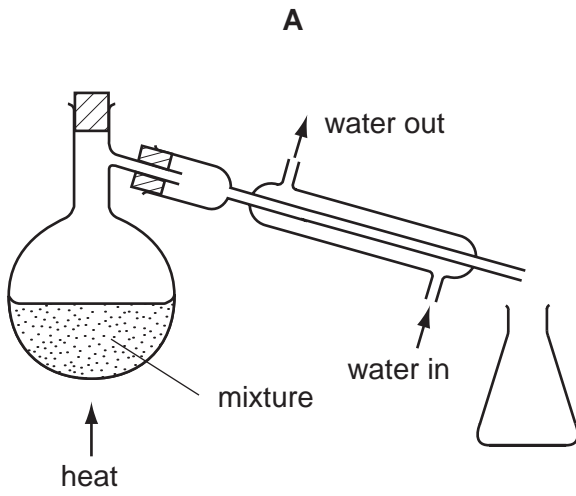
Which type of particle is emitted during the decay shown?

- A** alpha-particle
B beta-particle
C neutron
D proton

14 Substance X melts at 53 °C and boils at 100 °C.

It does not dissolve in water.

Which diagram shows the method used to separate X from a mixture of X and water?



15 If two neutral atoms are isotopes of the same element, they both have the same number of

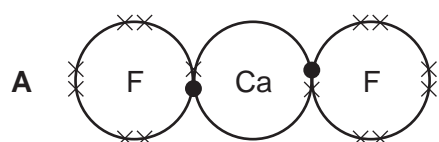
- 1 particles in the nucleus.
- 2 electrons.
- 3 neutrons.
- 4 protons.

Which statements are correct?

- A 1, 2 and 3
- B 1 and 3 only
- C 2 and 4
- D 4 only

16 Which diagram shows the electron arrangement in calcium fluoride?

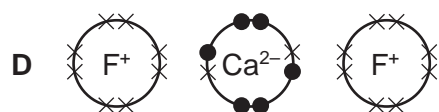
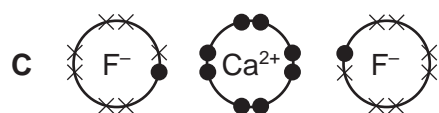
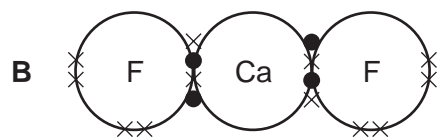
Only the outermost electrons of each ion are shown.



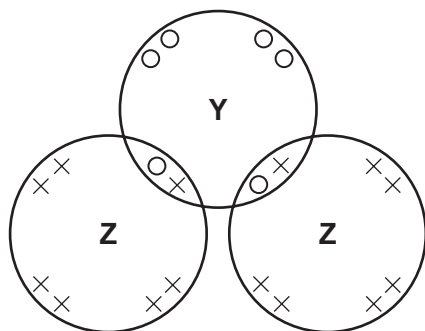
key

● = electrons from calcium

× = electrons from fluorine



- 17 The diagram shows the arrangement of electrons in a molecule of compound YZ_2 .



key

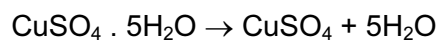
○ = outer electron of a Y atom

× = outer electron of a Z atom

What are elements Y and Z?

	Y	Z
A	calcium	chlorine
B	carbon	oxygen
C	oxygen	hydrogen
D	sulphur	chlorine

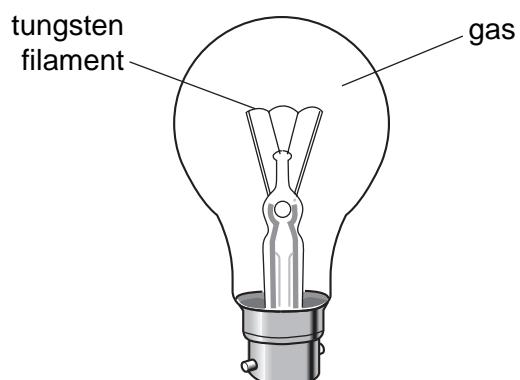
- 18 25.0 g of hydrated copper(II) sulphate crystals are heated to produce anhydrous copper(II) sulphate and water vapour.



What mass of anhydrous copper(II) sulphate is formed? [$\text{CuSO}_4 = 160$; $\text{H}_2\text{O} = 18$.]

- A** 9.0g **B** 16.0g **C** 22.5g **D** 25.0g
- 19 Which compound is an amphoteric oxide?
- A** calcium oxide
- B** copper(II) oxide
- C** sulphur dioxide
- D** zinc oxide

20 Which gas is present in the light bulb?



- A argon
- B carbon dioxide
- C nitrogen
- D oxygen

21 Water is formed when hydrogen is passed over the heated oxide of metal **X**.

No water is formed when hydrogen is passed over the heated oxide of metal **Y**.

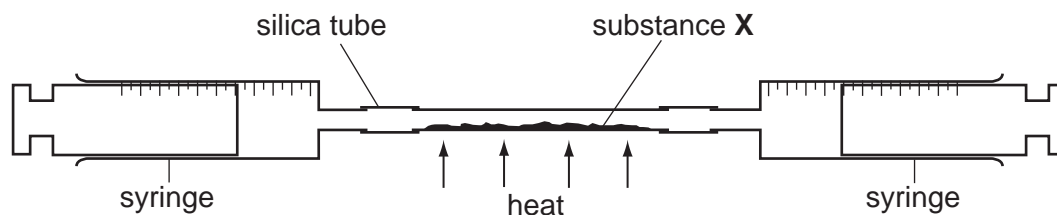
What is the order of reactivity of hydrogen, metal **X** and metal **Y**?

	most reactive	→	least reactive
A	hydrogen		X Y
B	X		hydrogen Y
C	X		Y hydrogen
D	Y		hydrogen X

22 Which metal is used for galvanising?

- A aluminium
- B copper
- C iron
- D zinc

- 23 The apparatus shown is used to measure the percentage by volume of oxygen in the



What is substance **X**?

- A anhydrous copper(II) sulphate
 - B calcium oxide
 - C carbon
 - D copper
- 24 Ammonium sulphate, $(\text{NH}_4)_2\text{SO}_4$, is sometimes added to soil to provide an element that is important for plant growth.

What is this element?

- A hydrogen
 - B nitrogen
 - C oxygen
 - D sulphur
- 25 In which of the following are all the compounds members of the same homologous series?
- A CH_4 C_2H_6 C_3H_6
 - B CH_4 C_2H_6 C_3H_8
 - C C_2H_4 C_3H_6 C_4H_{10}
 - D C_3H_4 C_3H_6 C_3H_8
- 26 Four of the products of the fractional distillation of petroleum are diesel oil, gasoline, kerosene and lubricating oil.

In which order do they distil off, lowest boiling point first?

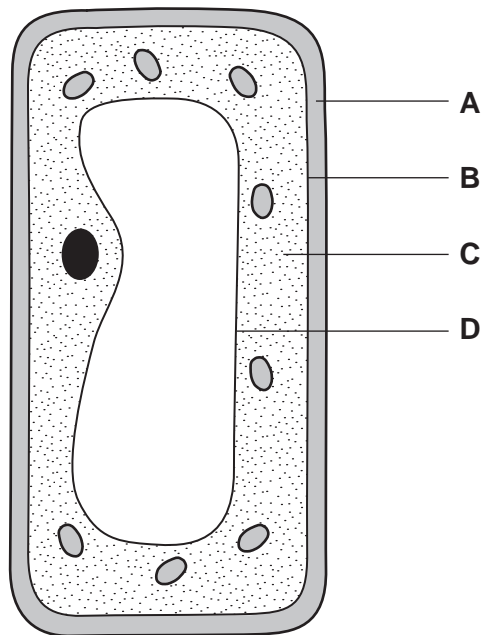
- A diesel oil → gasoline → kerosene → lubricating oil
- B gasoline → kerosene → diesel oil → lubricating oil
- C gasoline → kerosene → lubricating oil → diesel oil
- D kerosene → gasoline → diesel oil → lubricating oil

27 What does **not** happen in the combustion of pure ethane in a plentiful supply of air?

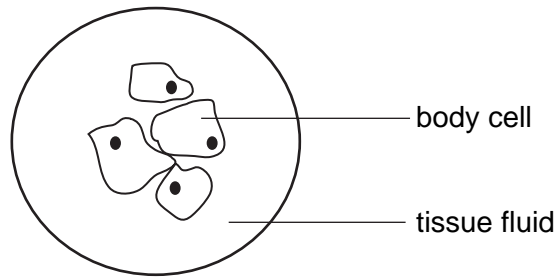
- A a smoky flame is seen
- B carbon dioxide is produced
- C energy is released
- D water is produced

28 The diagram shows a plant cell.

Which structure is the cell membrane?



29 The diagram shows a group of body cells surrounded by tissue fluid.



Which conditions cause the body cells to take in water?

	concentration of water in the tissue fluid	concentration of water in the cytoplasm of body cells
A	high	high
B	high	low
C	low	high
D	low	low

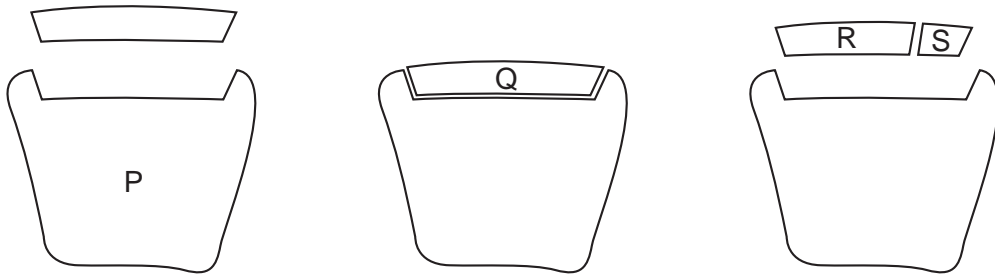
30 Four types of cell found in the leaf of a green plant are listed below.

- 1 epidermal cells (not including guard cells)
- 2 guard cells
- 3 palisade mesophyll cells
- 4 spongy mesophyll cells

Which cells contain chloroplasts?

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

31 The diagram represents stages in the breakdown of starch to maltose by the enzyme



What are the correct labels?

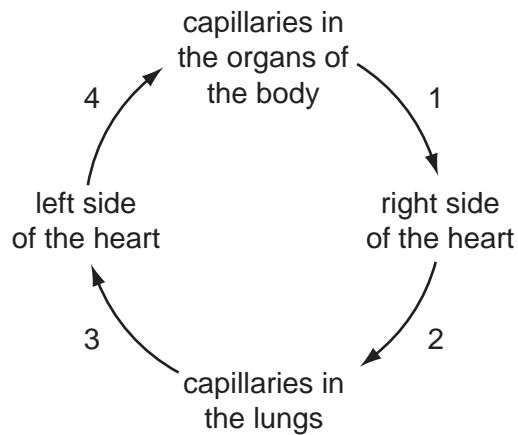
	amylase	maltose	starch
A	P	S	Q
B	Q	R	S
C	R	Q	P
D	S	P	R

32 A young plant is dug up and then re-planted. Later, the plant wilts.

What causes this?

- A** The leaves lose less water.
- B** The roots cannot take up mineral ions.
- C** The stomata close.
- D** The surface area of the roots is reduced.

33 The diagram shows the direction of blood flow in the human body.



At which stages does the blood contain the most oxygen?

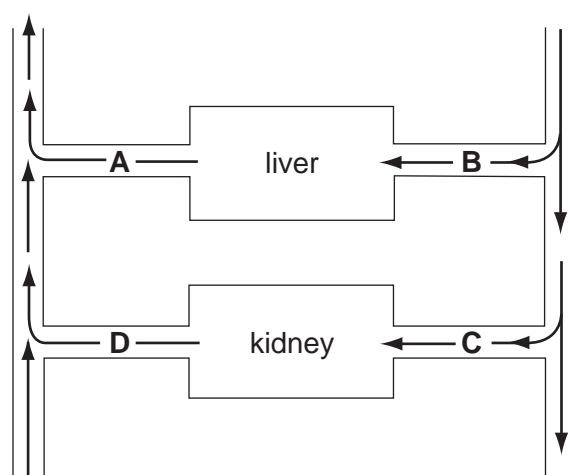
- A** 1 and 2
- B** 2 and 3
- C** 3 and 4
- D** 4 and 1

- 34 Scientists have investigated the absorption of mineral ions by plant roots. They found that this process needs energy from respiration.

Which observation best supports this idea?

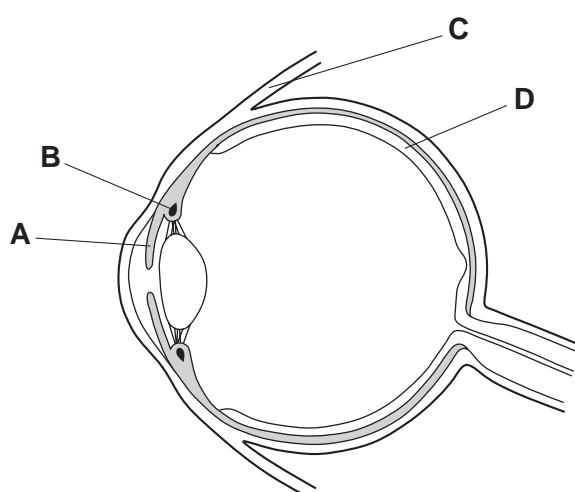
- A Carbohydrate is stored in the roots.
 - B Living roots give off carbon dioxide.
 - C Nitrate uptake is reduced in lower oxygen concentrations.
 - D The root hairs have a large surface area for gas exchange.
- 35 The diagram represents the blood supply to the liver and kidneys.

Which vessel contains blood with the lowest concentration of urea?

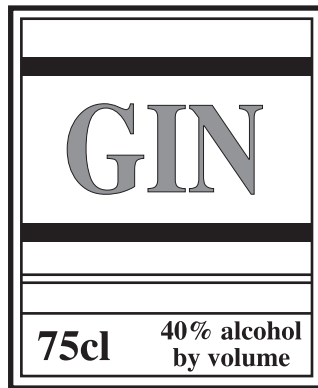


- 36 The diagram shows an eye in section.

Which structure is mainly responsible for changing the size of the pupil?



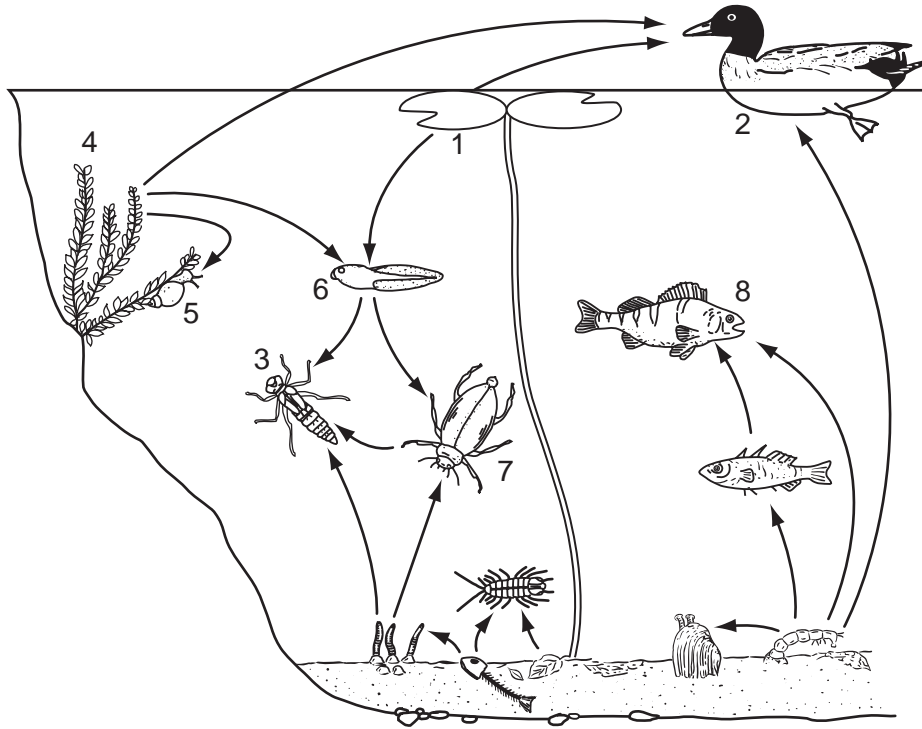
37 The diagram shows the label from a bottle of gin.



What will happen, during the next few hours, after a person drinks a large amount of gin?

- A Their judgement of distance will improve.
- B Their muscle control will be reduced.
- C Their reaction time will decrease.
- D Their urine output will decrease.

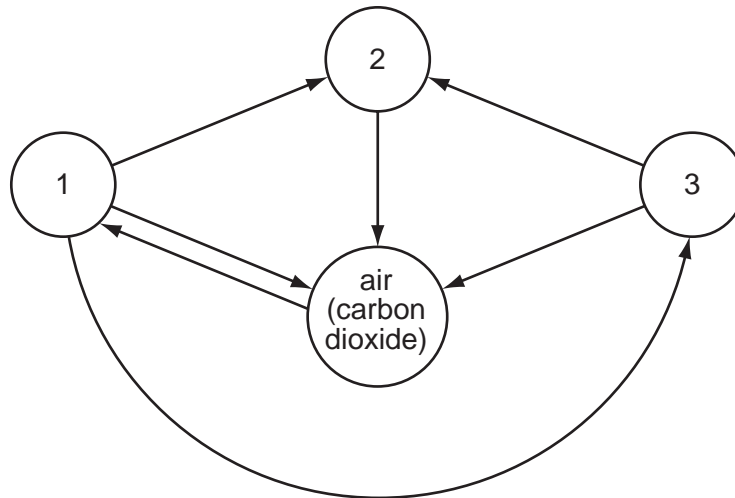
38 The diagram shows a food web in a freshwater pond.



Which of the organisms is a producer, a herbivore or a carnivore?

	producer	herbivore	carnivore
A	1	6	7
B	2	4	5
C	4	2	6
D	7	3	8

- 39 In the diagram, arrows represent the movements of carbon compounds in the carbon cycle. The circles represent carbon compounds in animals, decomposers, plants and in the air.



What is represented by each circle?

	1	2	3
A	decomposers	animals	plants
B	animals	decomposers	plants
C	plants	decomposers	animals
D	decomposers	plants	animals

- 40 Where does the exchange of materials take place between mother and fetus?

- A** oviduct
- B** umbilical cord
- C** uterus
- D** vagina

DATA SHEET
The Periodic Table of the Elements

		Group										
		I	II	III	IV	V	VI	VII	VIII	IX	X	
		1 H Hydrogen 1										
		4 He Helium 2										
7	9	3	4	5	6	7	8	9	10	11	12	13
Li Lithium	Be Beryllium	B Boron	C Carbon	N Nitrogen	O Oxygen	F Fluorine	Ne Neon	Na Sodium	Mg Magnesium	Al Aluminium	Si Silicon	P Phosphorus
11	12	13	14	15	16	17	18	19	20	21	22	23
Na Sodium	Mg Magnesium	Al Aluminium	Si Silicon	P Phosphorus	S Sulphur	Cl Chlorine	Ar Argon	K Potassium	Ca Calcium	Sc Scandium	Ti Titanium	V Vanadium
19	20	21	22	23	24	25	26	27	28	29	30	31
K Potassium	Ca Calcium	Sc Scandium	Ti Titanium	V Vanadium	Cr Chromium	Mn Manganese	Fe Iron	Co Cobalt	Ni Nickel	Cu Copper	Zn Zinc	Ga Gallium
37	38	39	40	41	42	43	44	45	46	47	48	49
Rb Rubidium	Sr Strontium	Y Yttrium	Zr Zirconium	Nb Niobium	Mo Molybdenum	Tc Technetium	Ru Ruthenium	Rh Rhodium	Pd Palladium	Ag Silver	Cd Cadmium	In Indium
55	56	57	72	73	74	75	76	77	78	79	80	81
Cs Caesium	Ba Barium	La Lanthanum	Hf Hafnium	Ta Tantalum	W Tungsten	Re Rhenium	Os Osmium	Ir Iridium	Pt Platinum	Au Gold	Hg Mercury	Tl Thallium
87	88	89	88	89	90	91	92	93	94	95	96	97
Fr Francium	Ra Radium	Ac Actinium	Rf Rutherfordium	Db Dubnium	Sg Seaborgium	Bh Bohrium	Hs Hassium	Mt Meitnerium	Ds Darmstadtium	Rg Roentgenium	Cn Copernicium	Nh Nihonium
103	104	105	106	107	108	109	110	111	112	113	114	115
Lr Lawrencium	Rf Rutherfordium	Db Dubnium	Sg Seaborgium	Bh Bohrium	Hs Hassium	Mt Meitnerium	Ds Darmstadtium	Rg Roentgenium	Cn Copernicium	Nh Nihonium	Fl Flerovium	Mc Moscovium
109	110	111	112	113	114	115	116	117	118	119	120	121
Lu Lutetium	Hf Hafnium	Ta Tantalum	W Tungsten	Re Rhenium	Os Osmium	Ir Iridium	Pt Platinum	Au Gold	Hg Mercury	Tl Thallium	Pb Lead	Bi Bismuth
71	72	73	74	75	76	77	78	79	80	81	82	83
Yb Ytterbium	Lu Lutetium	Hf Hafnium	Ta Tantalum	W Tungsten	Re Rhenium	Os Osmium	Ir Iridium	Au Gold	Hg Mercury	Tl Thallium	Pb Lead	Bi Bismuth
102	103	104	105	106	107	108	109	110	111	112	113	114
No Nobelium	Lr Lawrencium	Rf Rutherfordium	Db Dubnium	Sg Seaborgium	Bh Bohrium	Hs Hassium	Mt Meitnerium	Ds Darmstadtium	Rg Roentgenium	Cn Copernicium	Nh Nihonium	Fl Flerovium
108	109	110	111	112	113	114	115	116	117	118	119	120
Md Mendelevium	Lr Lawrencium	Rf Rutherfordium	Db Dubnium	Sg Seaborgium	Bh Bohrium	Hs Hassium	Mt Meitnerium	Ds Darmstadtium	Rg Roentgenium	Cn Copernicium	Nh Nihonium	Fl Flerovium
101	102	103	104	105	106	107	108	109	110	111	112	113
Md Mendelevium	Lr Lawrencium	Rf Rutherfordium	Db Dubnium	Sg Seaborgium	Bh Bohrium	Hs Hassium	Mt Meitnerium	Ds Darmstadtium	Rg Roentgenium	Cn Copernicium	Nh Nihonium	Fl Flerovium

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

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.).