



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

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)



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.

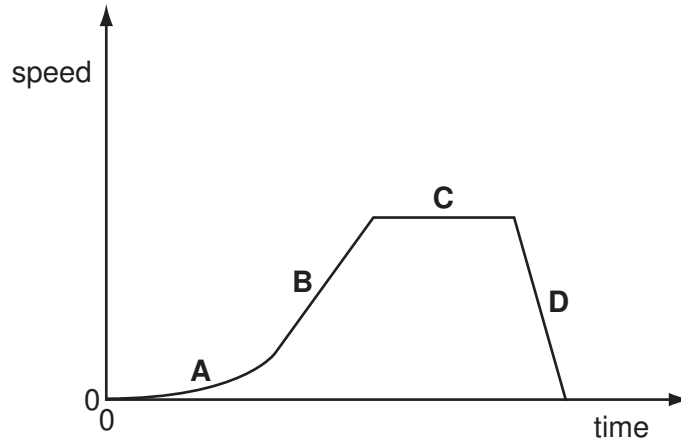
A copy of the Periodic Table is printed on page 20.

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

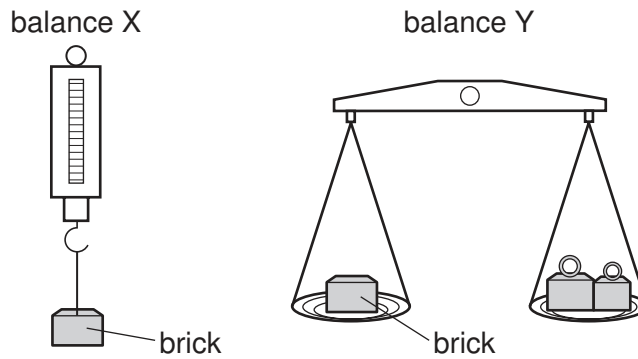


- 1 The diagram shows a speed-time graph for an object.

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.

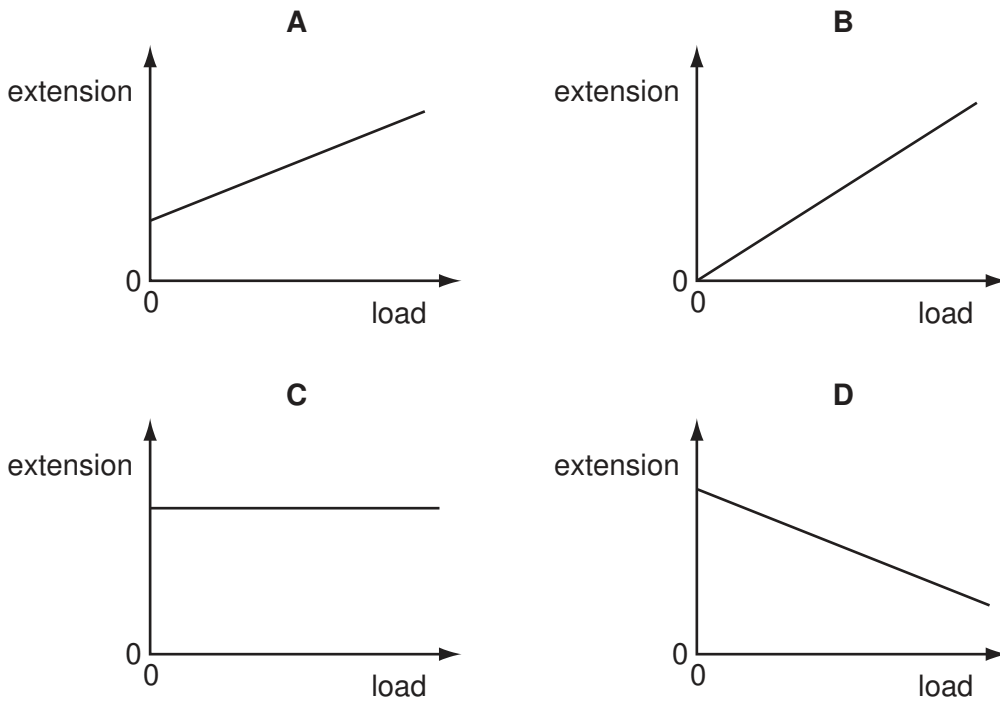


What is measured by each balance?

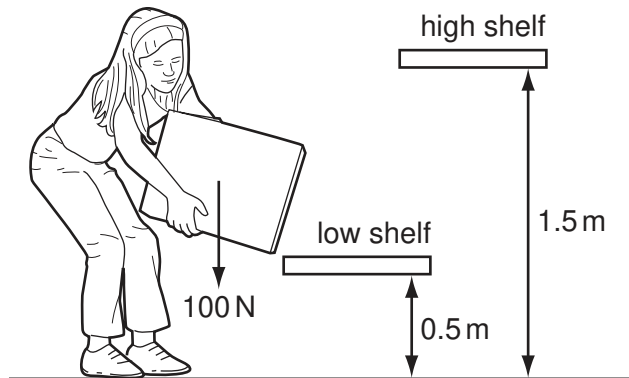
	balance X	balance Y
A	mass	mass
B	mass	weight
C	weight	mass
D	weight	weight

- 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?



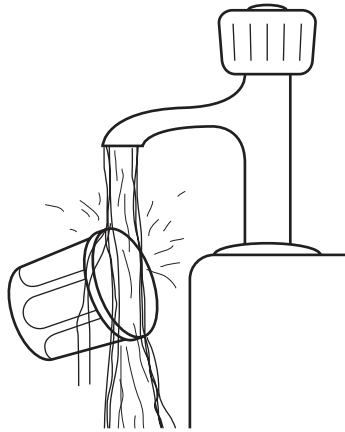
- 4 The diagram shows a girl lifting a box of weight 100 N from a low shelf to a high shelf.



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 unscrewed after it has been held under hot, running water for a few seconds.



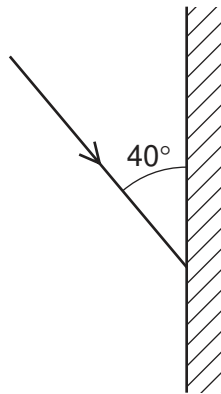
Why is this?

- 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.



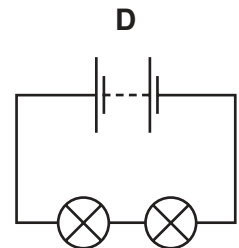
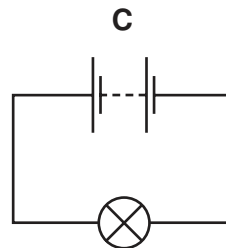
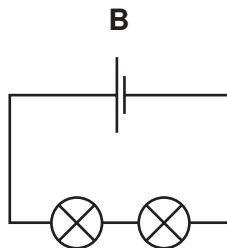
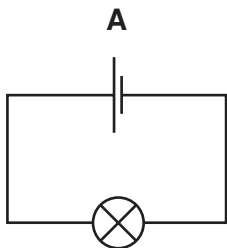
What are the angles of incidence and reflection?

	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?

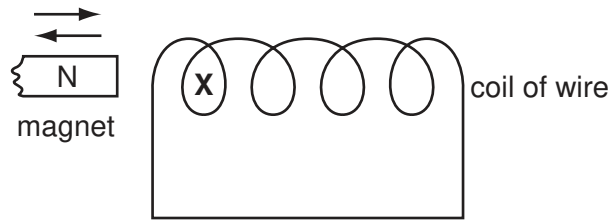


- 10 A potential difference of 4 V drives a current of 3 A through a resistor.

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.



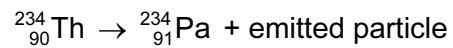
What describes the poles produced in the coil at X by the movement of the magnet?

	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.



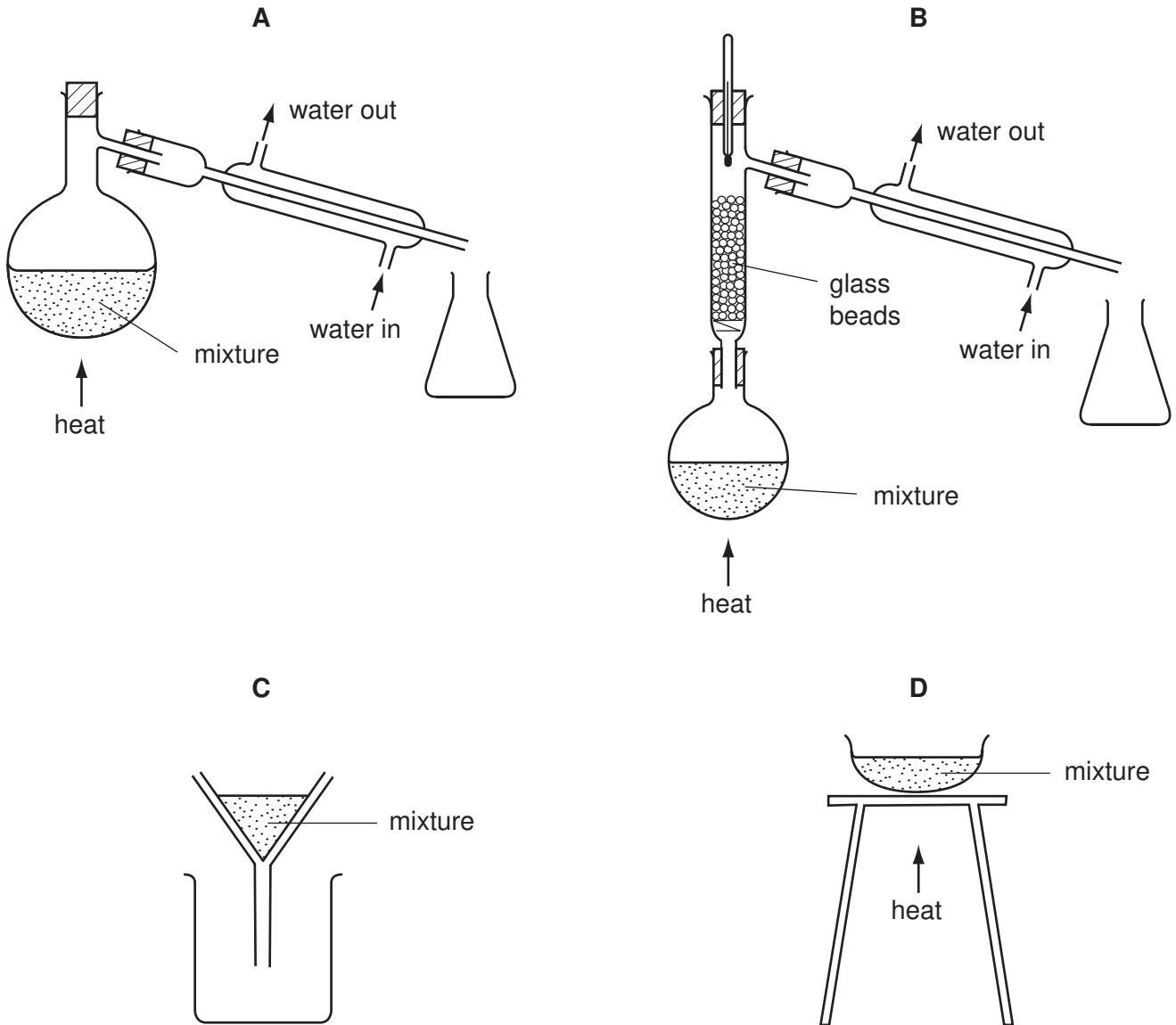
Which type of particle is emitted during the decay shown?

- 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?

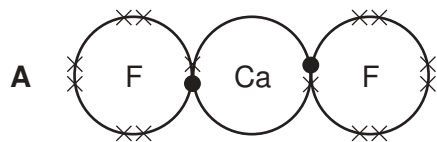


- 15 If two neutral atoms are isotopes of the same element, they both have the same number of
- 1 particles in the nucleus.
 - 2 electrons.
 - 3 neutrons.
 - 4 protons.

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?

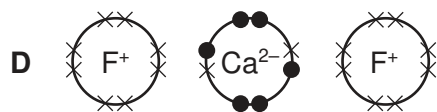
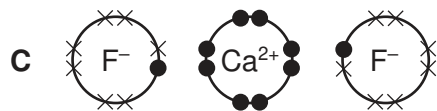
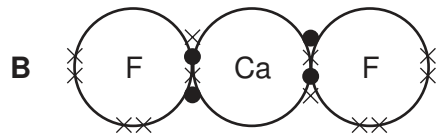
Only the outermost electrons of each ion are shown.



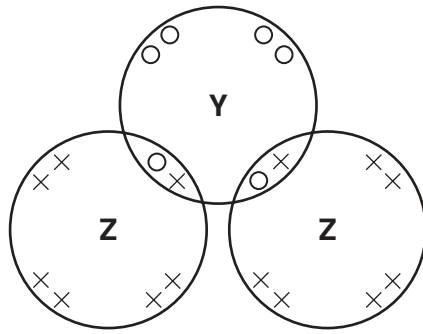
key

● = electrons from calcium

× = electrons from fluorine



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



key

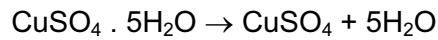
○ = outer electron of a **Y** atom

× = 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.



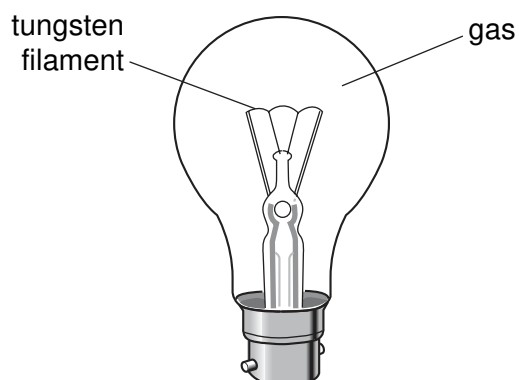
What mass of anhydrous copper(II) sulphate is formed? [$\text{CuSO}_4 = 160$; $\text{H}_2\text{O} = 18$.]

- 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**.

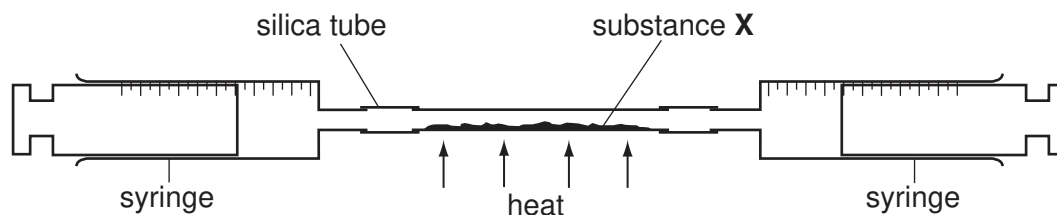
What is the order of reactivity of hydrogen, metal **X** and metal **Y**?

	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 air.



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?

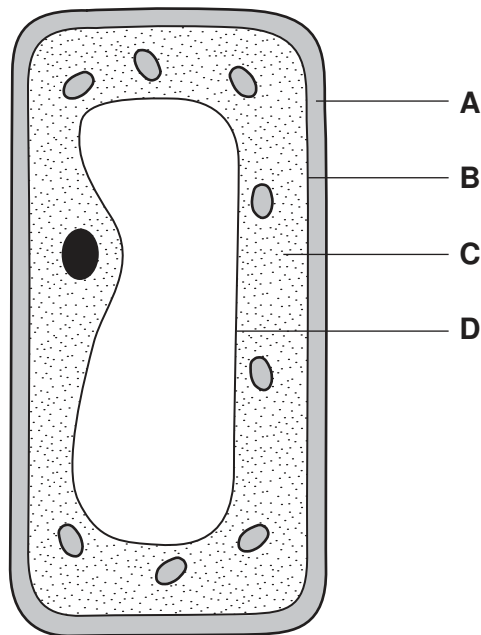
- A diesel oil → gasoline → kerosene → lubricating oil
- B gasoline → kerosene → diesel oil → lubricating oil
- C gasoline → kerosene → lubricating oil → diesel oil
- D kerosene → gasoline → diesel oil → lubricating oil

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

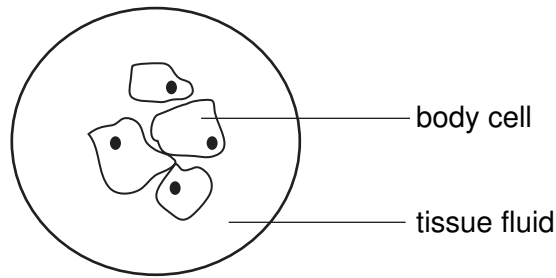
- A a smoky flame is seen
- B carbon dioxide is produced
- C energy is released
- D water is produced

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

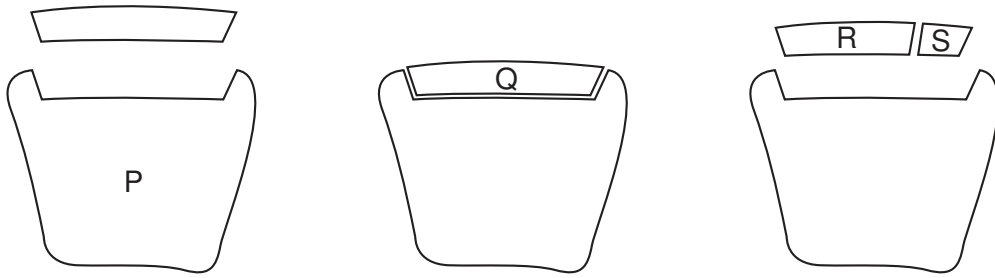
30 Four types of cell found in the leaf of a green plant are listed below.

- 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 amylase.



What are the correct labels?

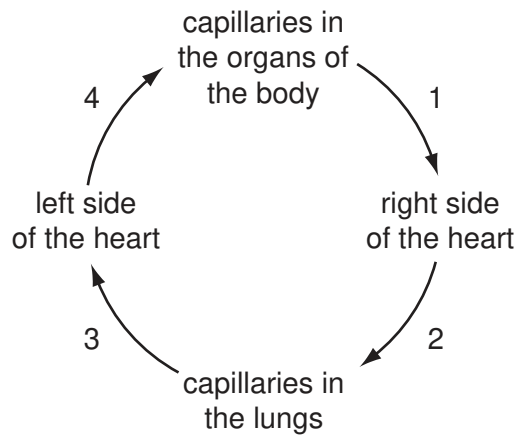
	amylase	maltose	starch
A	P	S	Q
B	Q	R	S
C	R	Q	P
D	S	P	R

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

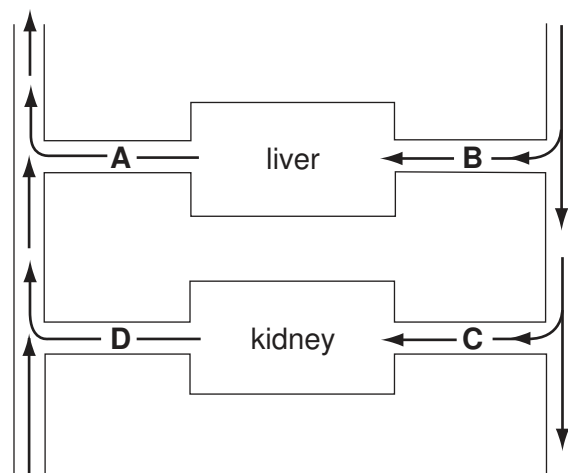
- 34 Scientists have investigated the absorption of mineral ions by plant roots. They believe that it needs energy from respiration.

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.

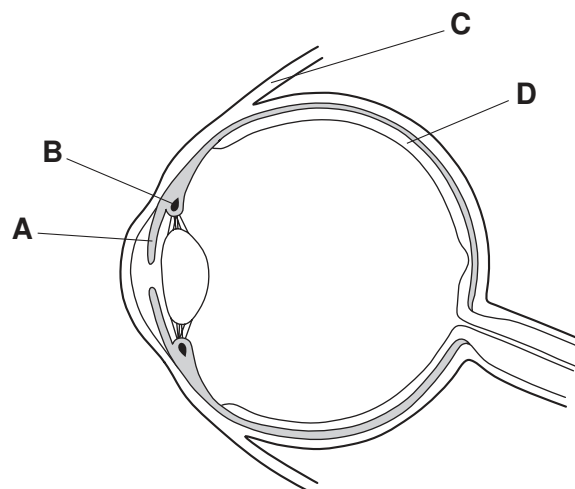
- 35 The diagram represents the blood supply to the liver and kidneys.

Which vessel contains blood with the lowest concentration of urea?

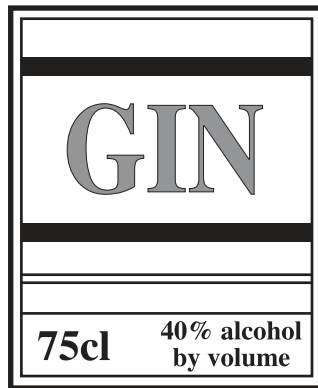


- 36 The diagram shows an eye in section.

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



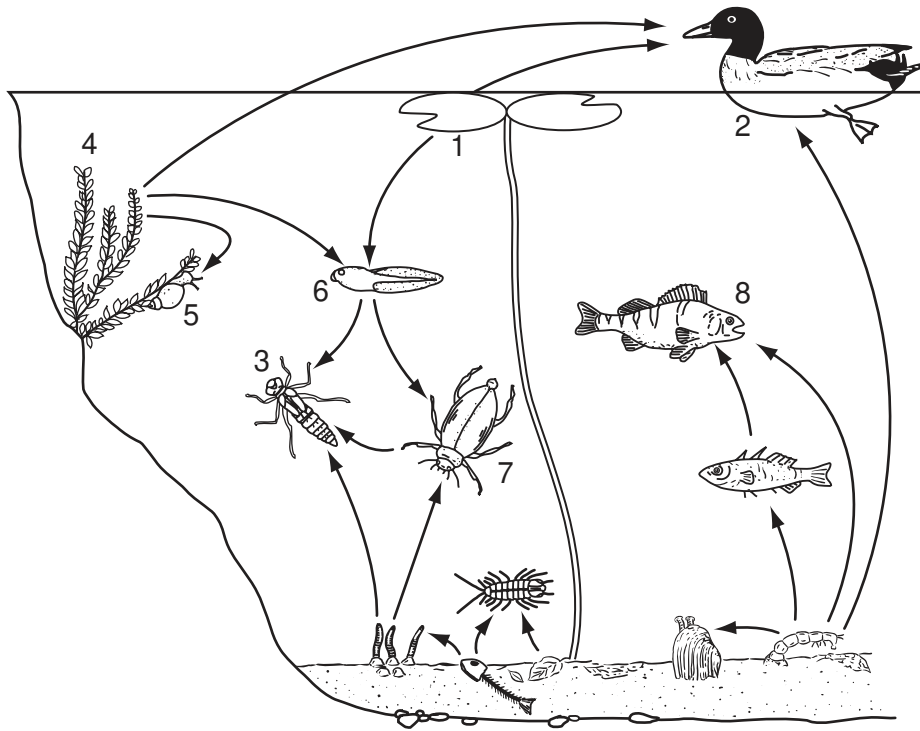
37 The diagram shows the label from a bottle of gin.



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.

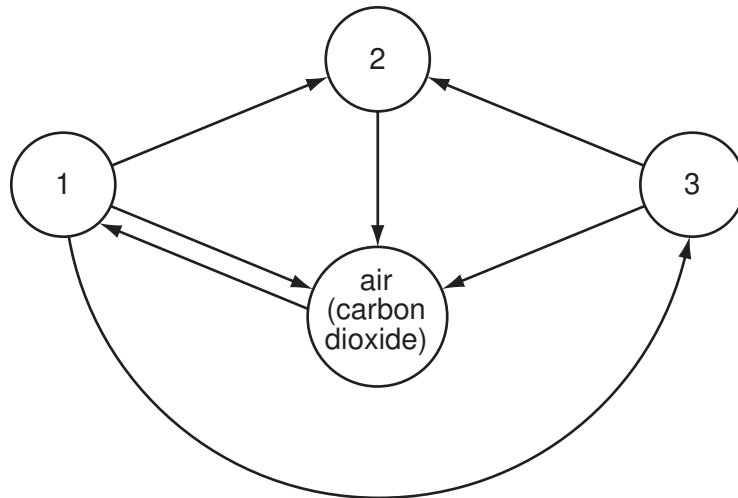
38 The diagram shows a food web in a freshwater pond.



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	0						
		1 H Hydrogen 1					4 He Helium 2						
7 Li Lithium 3	9 Be Beryllium 4							11 B Boron 5	12 C Carbon 6	14 N Nitrogen 7	16 O Oxygen 8	19 F Fluorine 9	20 Ne Neon 10
23 Na Sodium 11	24 Mg Magnesium 12							27 Al Aluminium 13	28 Si Silicon 14	31 P Phosphorus 15	32 S Sulphur 16	35.5 Cl Chlorine 17	40 Ar Argon 18
39 K Potassium 19	40 Ca Calcium 20							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							65 Zn Zinc 30	64 Cu Copper 29	59 Ni Nickel 28	59 Co Cobalt 27	64 Cu Copper 29	112 Cd Cadmium 48
133 Cs Caesium 55	137 Ba Barium 56							101 Ru Ruthenium 44	106 Pd Palladium 46	103 Rh Rhodium 45	103 Rh Rhodium 45	108 Ag Silver 47	128 Te Tellurium 52
226 Ra Radium 88	227 Ac Actinium 89							186 Os Osmium 76	195 Pt Platinum 78	192 Ir Iridium 77	192 Ir Iridium 77	197 Au Gold 79	207 Pb Lead 82
								204 Tl Thallium 81	201 Hg Mercury 80	209 Bi Bismuth 83	209 Bi Bismuth 83	210 Po Polonium 84	210 Po Polonium 84
								140 Ce Cerium 58	141 Pr Praseodymium 59	144 Nd Neodymium 60	150 Sm Samarium 62	157 Gd Gadolinium 64	165 Ho Holmium 67
								140 Ce Cerium 58	141 Pr Praseodymium 59	144 Nd Neodymium 60	150 Sm Samarium 62	157 Gd Gadolinium 64	165 Ho Holmium 67
								232 Th Thorium 90	238 U Uranium 92	238 U Uranium 92	238 U Uranium 92	238 U Uranium 92	238 U Uranium 92
								162 Dy Dysprosium 66	162 Dy Dysprosium 66	167 Er Erbium 68	169 Tm Thulium 69	173 Yb Ytterbium 70	175 Lu Lutetium 71
								98 Cf Californium 98	98 Cf Californium 98	100 Fm Fermium 100	101 Md Mendelevium 101	102 No Nobelium 102	103 Lr Lawrencium 103

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

a	X	b
Key	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.).

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