Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE **0653/12**

Paper 1 Multiple Choice (Core) **October/November 2018**

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, 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.
DO **NOT** WRITE IN ANY BARCODES.

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.
Electronic calculators may be used.

1 Movement is a characteristic of all living organisms.

Which two other characteristics of living organisms provide the energy for movement?

A excretion and nutrition

B growth and sensitivity

C nutrition and respiration

D respiration and growth

2 Which process depends on diffusion?

A circulation

B digestion

C gaseous exchange

D phagocytosis

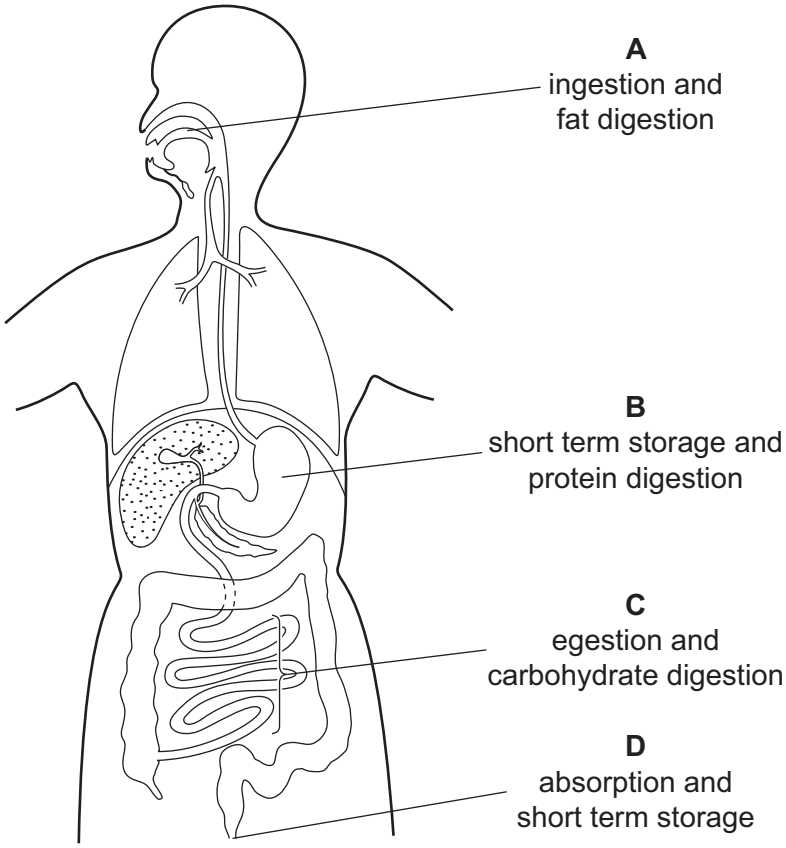
3 Enzymes are used in digestion to break down larger molecules into smaller molecules.

Which row matches the large molecules with the small molecules they are broken down into?

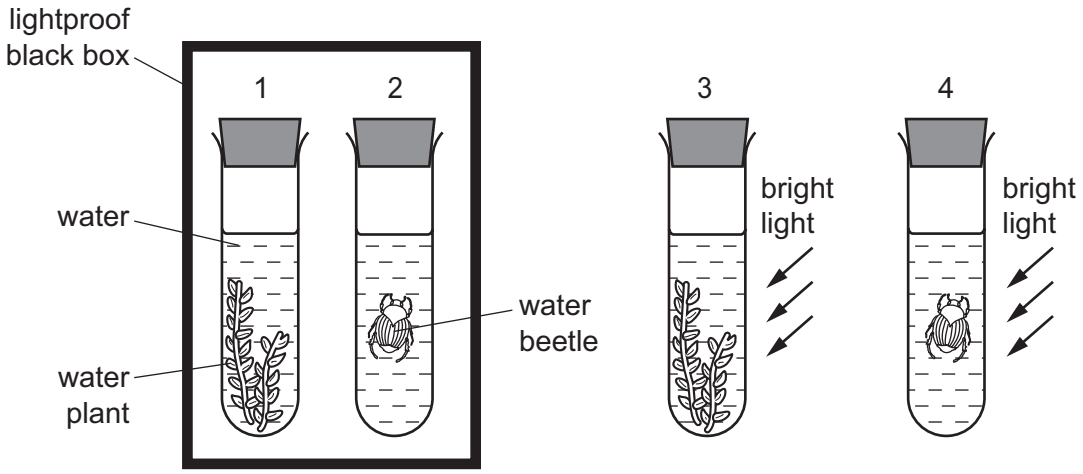
	large molecules	small molecules
A	fat	glycerol and fatty acids
B	glycogen	glycerol and amino acids
C	protein	simple sugars
D	starch	amino acids

4 The diagram shows the human alimentary canal. The labels state the functions of four of its parts.

Which label is correct?



5 The diagram shows apparatus set up to investigate photosynthesis.



In which test-tubes will the carbon dioxide concentration in the water decrease?

	test-tube			
	1	2	3	4
A	no	no	yes	no
B	no	no	yes	yes
C	yes	no	no	no
D	yes	yes	no	no

6 The table shows components of blood and their functions.

Which row is correct?

	blood component	function of component
A	plasma	antibody formation
B	platelets	transport of carbon dioxide
C	red blood cells	blood clotting
D	white blood cells	phagocytosis

7 Which word equation represents aerobic respiration?

A carbon dioxide + water → glucose

B carbon dioxide + water → glucose + oxygen

C glucose + oxygen → carbon dioxide

D glucose + oxygen → carbon dioxide + water

8 What happens to the blood glucose concentration and pulse rate when adrenaline is released into a person's bloodstream?

	blood glucose concentration	pulse rate
A	decreases	increases
B	decreases	decreases
C	increases	increases
D	increases	decreases

9 A plant produces flowers with stigmas and ovaries, but no anthers.

What effect will this have on the plant?

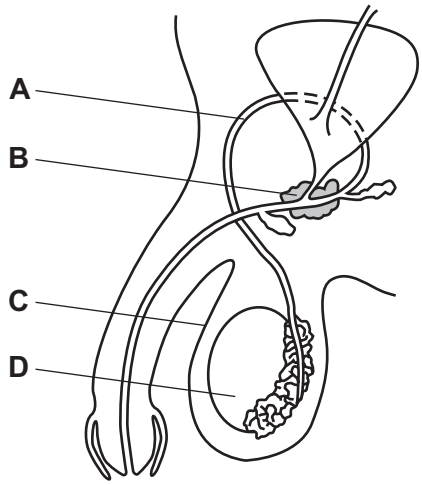
A It cannot be insect-pollinated.

B It cannot produce seeds.

C It will only be able to reproduce asexually.

D It will not be able to produce pollen grains.

10 The diagram shows the male reproductive system.



Which row names the labelled structure and states its function?

	name of structure	function of structure
A	sperm duct	sperm pass directly into the uterus from this tube
B	testis	produces the sperm
C	scrotum	holds the testis
D	prostate gland	stores the sperm

11 What is a herbivore?

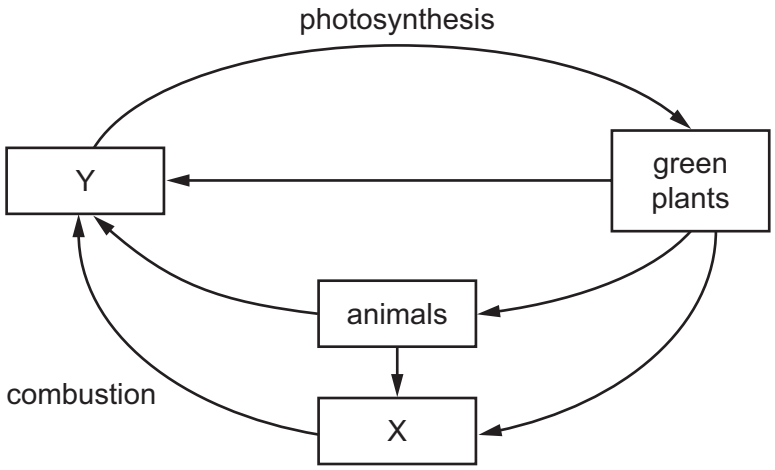
A an organism that gets its energy by eating other animals

B an organism that gets its energy by eating plants

C an organism that makes its own organic nutrients

D the first organism in a food chain

12 The diagram shows part of the carbon cycle.



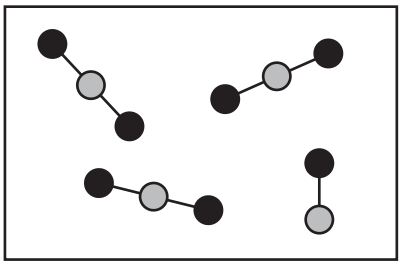
What are X and Y?

	X	Y
A	carbon dioxide	oxygen
B	fossil fuel	carbon dioxide
C	fossil fuel	oxygen
D	oxygen	carbon dioxide

13 Which are possible harmful effects of deforestation?

	global warming	species extinction
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

14 The diagram represents a mixture of carbon dioxide, CO_2, and carbon monoxide, CO.



Which statement is correct?

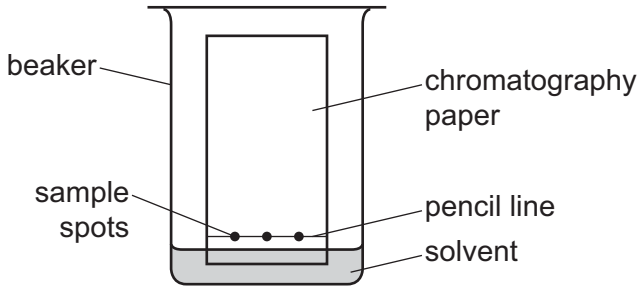
A The mixture contains 4 elements.

B The mixture contains 4 molecules.

C The mixture contains 11 elements.

D The mixture contains 11 molecules.

15 The apparatus used for chromatography is shown.



Which statement about the method used for chromatography is **not** correct?

A The beaker is swirled to help the solvent to rise.

B The chromatography paper is placed in the beaker after the solvent has been added.

C The chromatography paper is removed before the solvent reaches the top of the paper.

D The sample spots are placed on the pencil line above the level of the solvent.

16 The atomic number of element X is 11.

The mass number of element X is 23.

Which statement about an atom of X is correct?

A It contains 12 nucleons in the nucleus and 11 orbiting electrons.

B It contains 12 nucleons in the nucleus and 11 orbiting protons.

C It contains 23 nucleons in the nucleus and 11 orbiting electrons.

D It contains 23 nucleons in the nucleus and 11 orbiting protons.

17 Which formula does **not** represent an acid?

A H_2SO_4 **B** HCl **C** HNO_3 **D** NH_3

18 The breakdown of molten lead bromide by ……1…… forms the elements lead and bromine.

Lead is formed at the ……2…… .

Which words complete gaps 1 and 2?

	1	2
A	electrolysis	anode
B	electrolysis	cathode
C	reduction	anode
D	reduction	cathode

19 Sodium chloride dissolves in water in an endothermic process.

When calcium chloride dissolves in water, the temperature increases.

Which statement is correct?

A The process of dissolving calcium chloride is neither exothermic nor endothermic.

B The temperature increases when sodium chloride dissolves.

C The temperature remains constant when sodium chloride dissolves.

D When calcium chloride dissolves in water the process is exothermic.

20 Hydrogen peroxide decomposes to form oxygen and water.

A catalyst is added to the hydrogen peroxide.

Which row describes the change in the rate of reaction and the mass of catalyst left at the end of the reaction?

	rate of reaction	mass of catalyst left at end of reaction
A	decrease	less
B	decrease	no change
C	increase	less
D	increase	no change

21 Iron oxide reacts with carbon monoxide.

The word equation for the reaction is:

iron oxide + carbon monoxide → iron + carbon dioxide

Which statement is **not** correct?

A Carbon is neither oxidised nor reduced.

B Carbon is oxidised.

C Iron is reduced.

D This is a redox reaction.

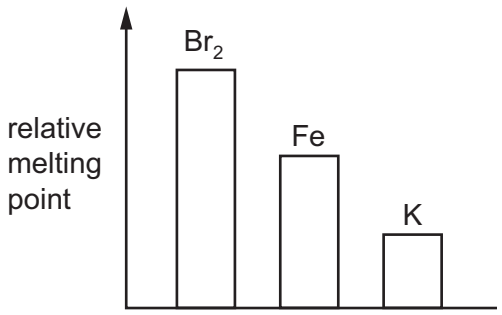
22 Compound X reacts with compound Y to form sodium sulfate, water and carbon dioxide.

What are X and Y?

	X	Y
A	sodium carbonate	hydrochloric acid
B	sodium carbonate	sulfuric acid
C	sodium hydroxide	hydrochloric acid
D	sodium hydroxide	sulfuric acid

23 Which bar chart shows the relative melting points of bromine, iron and potassium?

A



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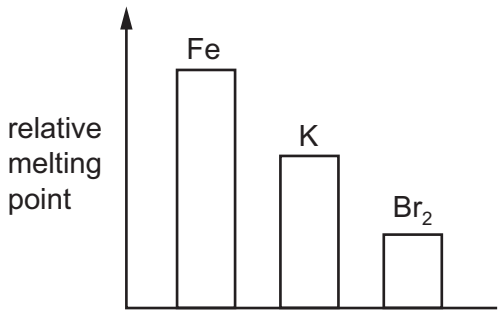

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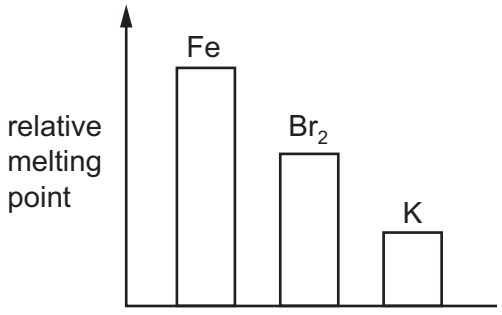
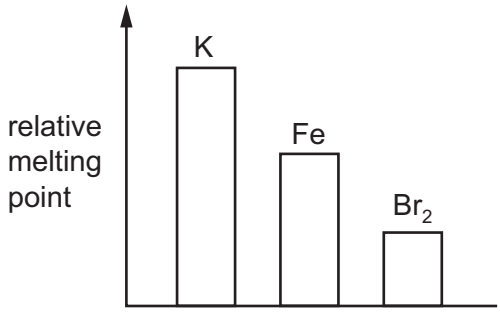
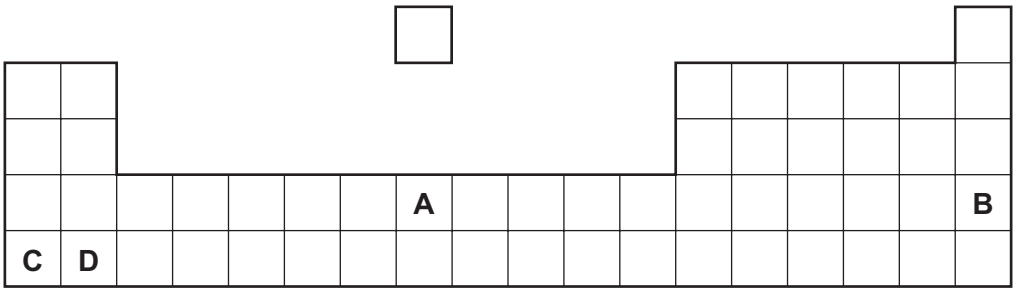


D



24 The positions of four elements are shown in the outline of the Periodic Table.

Which element has a high melting point and forms coloured compounds?



25 Metal X reacts rapidly with steam but only very slowly with cold water.

What is X?

A copper

B iron

C magnesium

D sodium

26 What is a chemical test for water?

A Add blue cobalt chloride paper.

B Add blue copper sulfate crystals.

C Measure the density.

D Measure the melting point.

27 Gasoline is a hydrocarbon fuel obtained from petroleum.

Which statement is correct?

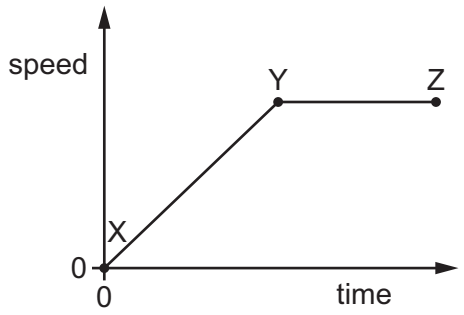
A Gasoline burns to form carbon dioxide and water.

B Gasoline contains the elements carbon, hydrogen and oxygen.

C Gasoline is used as a fuel in diesel engines.

D The combustion of gasoline is an endothermic reaction.

28 A car is travelling along a straight road. The diagram is a speed-time graph for part of its journey.



What is happening to the car between X and Y and what is happening between Y and Z?

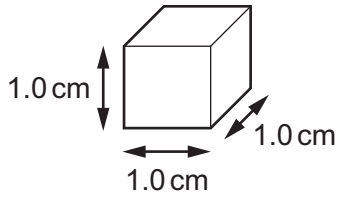
	between X and Y	between Y and Z
A	changing speed	constant speed
B	changing speed	not moving
C	constant speed	constant speed
D	constant speed	not moving

29 An object of known mass on Earth is taken to another planet.

Which row gives correct information about the mass of the object on the other planet?

	unit of mass	mass of object
A	kilogram	different
B	kilogram	the same
C	newton	different
D	newton	the same

30 A cube of aluminium has sides of length 1.0 cm.



Compared with this cube, which statement about a cube of aluminium with sides of 2.0 cm is correct?

A It has the same density.

B It has the same mass.

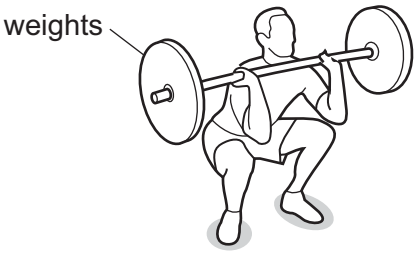
C It has twice the density.

D It has twice the mass.

31 Weightlifting involves a number of different stages.

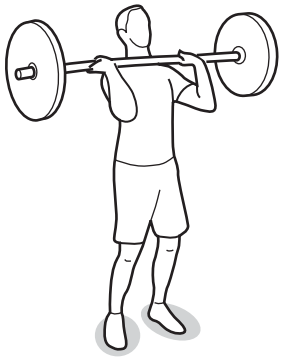
In which stage is **no** work being done on the weights?

A



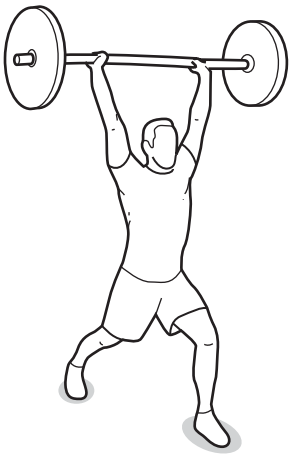
The weights are lifted up off the floor.

B



The weights are lifted as the man stands up.

C



The weights are lifted above the head.

D

The weights are held stationary above the head.

32 A liquid evaporates when molecules leave its surface.

Which molecules leave the surface, and what happens to the temperature of the remaining liquid?

A The more energetic molecules leave and the temperature falls.

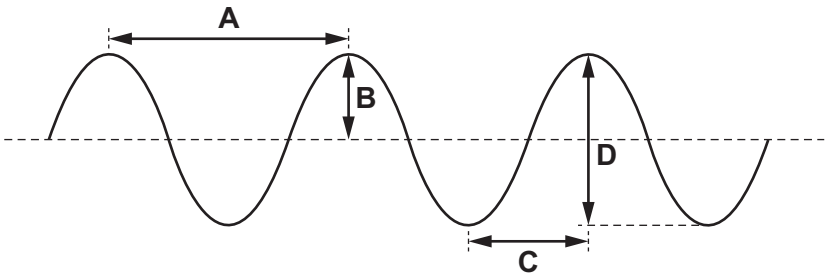
B The more energetic molecules leave and the temperature rises.

C The less energetic molecules leave and the temperature falls.

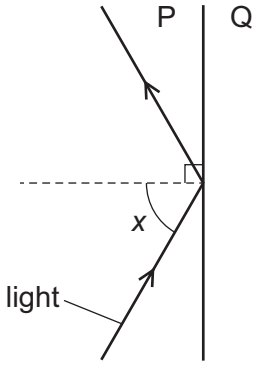
D The less energetic molecules leave and the temperature rises.

33 The diagram represents a wave.

Which labelled distance gives the amplitude of the wave?



34 The diagram shows light travelling in substance P. The light strikes substance Q at an angle of incidence *x*. The light is totally internally reflected.



One of the substances is air and the other substance is glass.

Which substance is air, and how does angle *x* compare with the critical angle?

	substance that is air	angle *x*
A	P	greater than critical angle
B	P	less than critical angle
C	Q	greater than critical angle
D	Q	less than critical angle

35 A student is watching television. He uses a remote controller to change the programme.

The remote controller uses electromagnetic waves. Electromagnetic waves are also used to transmit the television signals from a satellite.

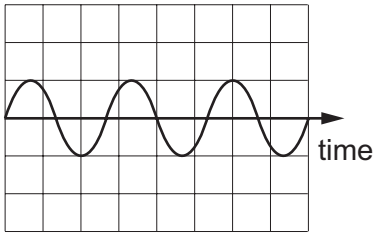
Which row shows the type of wave used for each purpose?

	remote controller	satellite
A	infra-red	microwaves
B	infra-red	radio waves
C	ultraviolet	microwaves
D	ultraviolet	radio waves

36 The diagrams represent four different sound waves. The scales are the same in all the diagrams.

Which sound has the lowest pitch?

A



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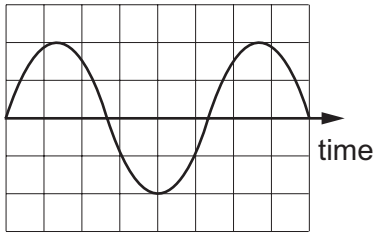

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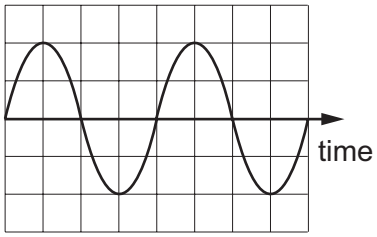
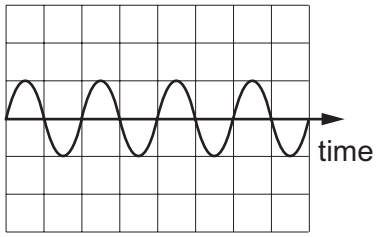


D



37 Which group contains only electrical insulators?

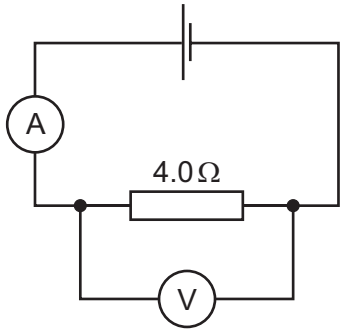
A air, lead, rubber

B copper, lead, steel

C plastic, rubber, wood

D plastic, steel, wood

38 The circuit shown includes a 4.0 Ω resistor.



Which pair of meter readings in the table is possible?

	voltmeter reading / V	ammeter reading / A
A	0.50	2.0
B	1.0	4.0
C	2.0	0.5
D	2.5	1.5

39 It is hazardous to use an electric hairdryer near a hot bath.

Why is this?

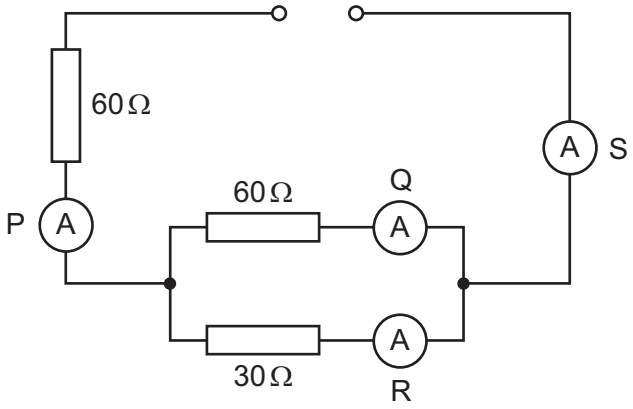
A The cable to the hairdryer might overheat.

B The motor in the hairdryer might become rusty and not work.

C The water might enter the hairdryer so the user could receive an electric shock.

D The warmth of the atmosphere might damage the insulation in the hairdryer.

40 The circuit contains four ammeters P, Q, R and S.



Which statement about the readings on the ammeters is correct?

A The reading on S is less than the reading on P.

B The reading on Q is greater than the reading on S.

C The reading on R is greater than the reading on S.

D The reading on Q is less than the reading on P.

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The Periodic Table of Elements

Group																	
I	II											III	IV	V	VI	VII	VIII
							1 H hydrogen 1										2 He helium 4
3 Li lithium 7	4 Be beryllium 9											5 B boron 11	6 C carbon 12	7 N nitrogen 14	8 O oxygen 16	9 F fluorine 19	10 Ne neon 20
11 Na sodium 23	12 Mg magnesium 24											13 Al aluminium 27	14 Si silicon 28	15 P phosphorus 31	16 S sulfur 32	17 Cl chlorine 35.5	18 Ar argon 40
19 K potassium 39	20 Ca calcium 40	21 Sc scandium 45	22 Ti titanium 48	23 V vanadium 51	24 Cr chromium 52	25 Mn manganese 55	26 Fe iron 56	27 Co cobalt 59	28 Ni nickel 59	29 Cu copper 64	30 Zn zinc 65	31 Ga gallium 70	32 Ge germanium 73	33 As arsenic 75	34 Se selenium 79	35 Br bromine 80	36 Kr krypton 84
37 Rb rubidium 85	38 Sr strontium 88	39 Y yttrium 89	40 Zr zirconium 91	41 Nb niobium 93	42 Mo molybdenum 96	43 Tc technetium –	44 Ru ruthenium 101	45 Rh rhodium 103	46 Pd palladium 106	47 Ag silver 108	48 Cd cadmium 112	49 In indium 115	50 Sn tin 119	51 Sb antimony 122	52 Te tellurium 128	53 I iodine 127	54 Xe xenon 131
55 Cs caesium 133	56 Ba barium 137	57–71 lanthanoids	72 Hf hafnium 178	73 Ta tantalum 181	74 W tungsten 184	75 Re rhenium 186	76 Os osmium 190	77 Ir iridium 192	78 Pt platinum 195	79 Au gold 197	80 Hg mercury 201	81 Tl thallium 204	82 Pb lead 207	83 Bi bismuth 209	84 Po polonium –	85 At astatine –	86 Rn radon –
87 Fr francium –	88 Ra radium –	89–103 actinoids	104 Rf rutherfordium –	105 Db dubnium –	106 Sg seaborgium –	107 Bh bohrium –	108 Hs hassium –	109 Mt meitnerium –	110 Ds darmstadtium –	111 Rg roentgenium –	112 Cn copernicium –		114 Fl flerovium –		116 Lv livermorium –		

Key

atomic number
atomic symbol
name
relative atomic mass

lanthanoids	57 La lanthanum 139	58 Ce cerium 140	59 Pr praseodymium 141	60 Nd neodymium 144	61 Pm promethium –	62 Sm samarium 150	63 Eu europium 152	64 Gd gadolinium 157	65 Tb terbium 159	66 Dy dysprosium 163	67 Ho holmium 165	68 Er erbium 167	69 Tm thulium 169	70 Yb ytterbium 173	71 Lu lutetium 175
actinoids	89 Ac actinium –	90 Th thorium 232	91 Pa protactinium 231	92 U uranium 238	93 Np neptunium –	94 Pu plutonium –	95 Am americium –	96 Cm curium –	97 Bk berkelium –	98 Cf californium –	99 Es einsteinium –	100 Fm fermium –	101 Md mendelevium –	102 No nobelium –	103 Lr lawrencium –

The volume of one mole of any gas is 24 dm^3 at room temperature and pressure (r.t.p.).