



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

**COMBINED SCIENCE**

**0653/11**

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.

This document consists of **18** printed pages and **2** blank pages.

1 Which two structures are found in plant cells but **not** in animal cells?

- A cell membrane and cell wall
- B cell wall and chloroplasts
- C chloroplasts and nucleus
- D nucleus and cell membrane

2 Which process depends on diffusion?

- A circulation
- B digestion
- C gaseous exchange
- D phagocytosis

3 Biological catalysts speed up reactions in the body.

What is another name for biological catalysts?

- A antibodies
- B enzymes
- C fatty acids
- D hormones

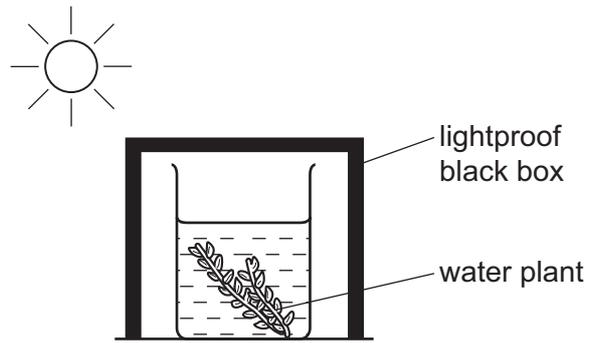
4 A food substance was tested with various reagents. The results of the tests are shown.

reagent	Benedict's solution	biuret	ethanol	iodine solution
result	turned orange	stayed pale blue	went milky	went blue / black

Which element did the food substance **not** contain?

- A carbon
- B hydrogen
- C nitrogen
- D oxygen

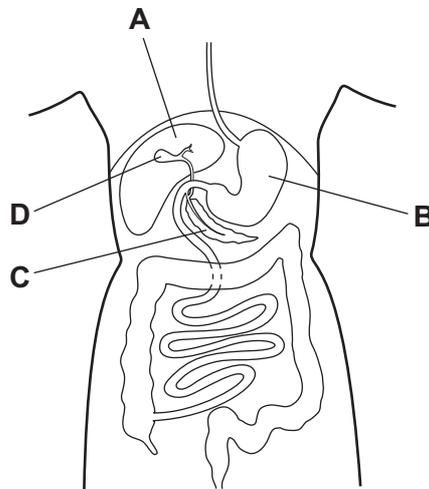
- 5 The diagram shows a water plant surrounded by a black box.



Which change takes place if the black box is removed?

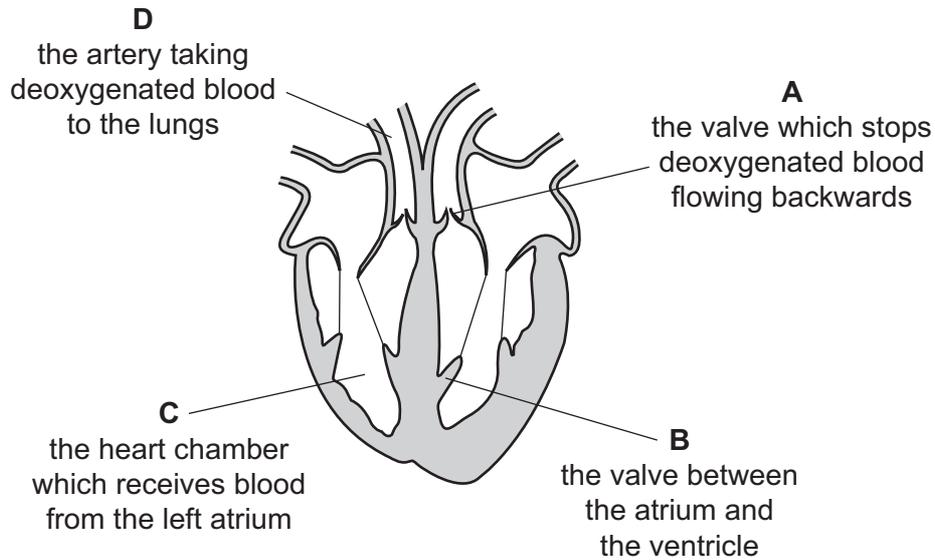
- A Oxygen production increases.
  - B Respiration stops.
  - C Stomata close.
  - D Water uptake decreases.
- 6 The diagram shows part of the human alimentary canal.

Where is bile made?



7 The diagram shows a section through the heart.

Which labelled part has the correct function stated?



8 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

9 Which row states how the composition of expired air is different to the composition of inspired air?

	concentration of gases in expired air			
	carbon dioxide	oxygen	nitrogen	water vapour
<b>A</b>	less	less	unchanged	unchanged
<b>B</b>	less	more	less	more
<b>C</b>	more	less	unchanged	more
<b>D</b>	more	more	less	unchanged

10 Which statement about adrenaline is **not** correct?

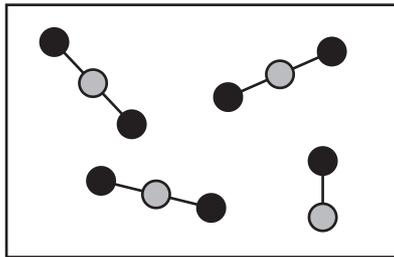
- A** Adrenaline is transported in the blood plasma.
- B** Adrenaline lowers the blood glucose concentration.
- C** The heart is one of the target organs for adrenaline.
- D** The liver destroys adrenaline.



13 Which are possible harmful effects of deforestation?

	global warming	species extinction
<b>A</b>	✓	✓
<b>B</b>	✓	x
<b>C</b>	x	✓
<b>D</b>	x	x

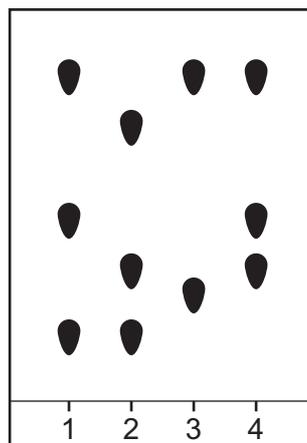
14 The diagram represents a mixture of carbon dioxide,  $\text{CO}_2$ , and carbon monoxide,  $\text{CO}$ .



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 Four dyes are separated using chromatography.

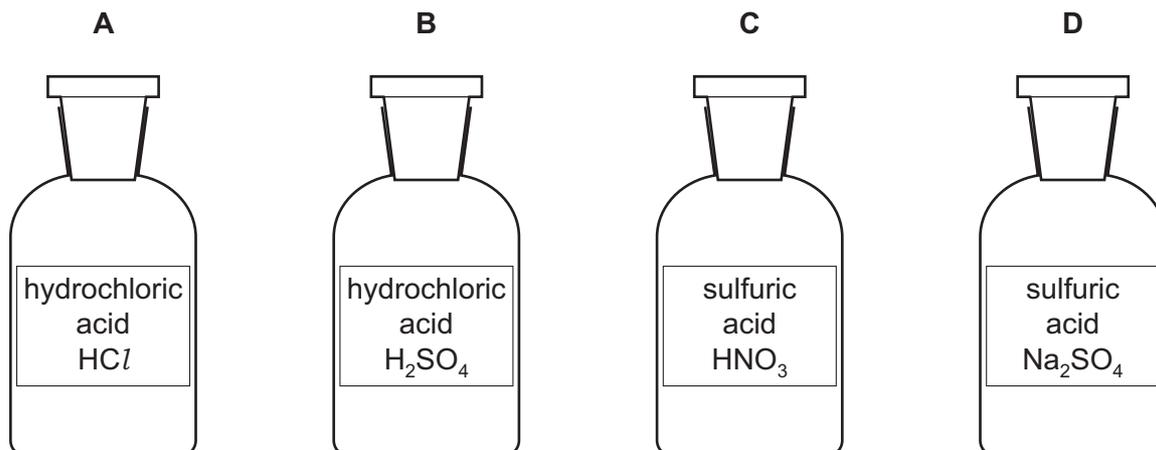
The results are shown.



Which dyes contain two colours that are present in both dyes?

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

16 On which label does the formula match the name of the acid?



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

Lead is formed at the .....2..... .

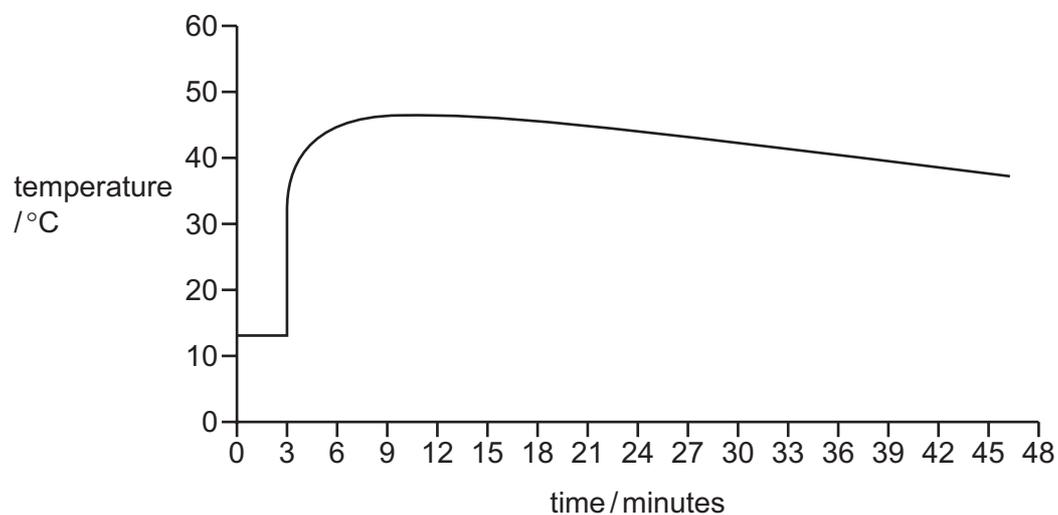
Which words complete gaps 1 and 2?

	1	2
<b>A</b>	electrolysis	anode
<b>B</b>	electrolysis	cathode
<b>C</b>	reduction	anode
<b>D</b>	reduction	cathode

18 The temperature of aqueous copper sulfate is measured.

After three minutes, magnesium is stirred into the solution. The temperature of the mixture is recorded every minute.

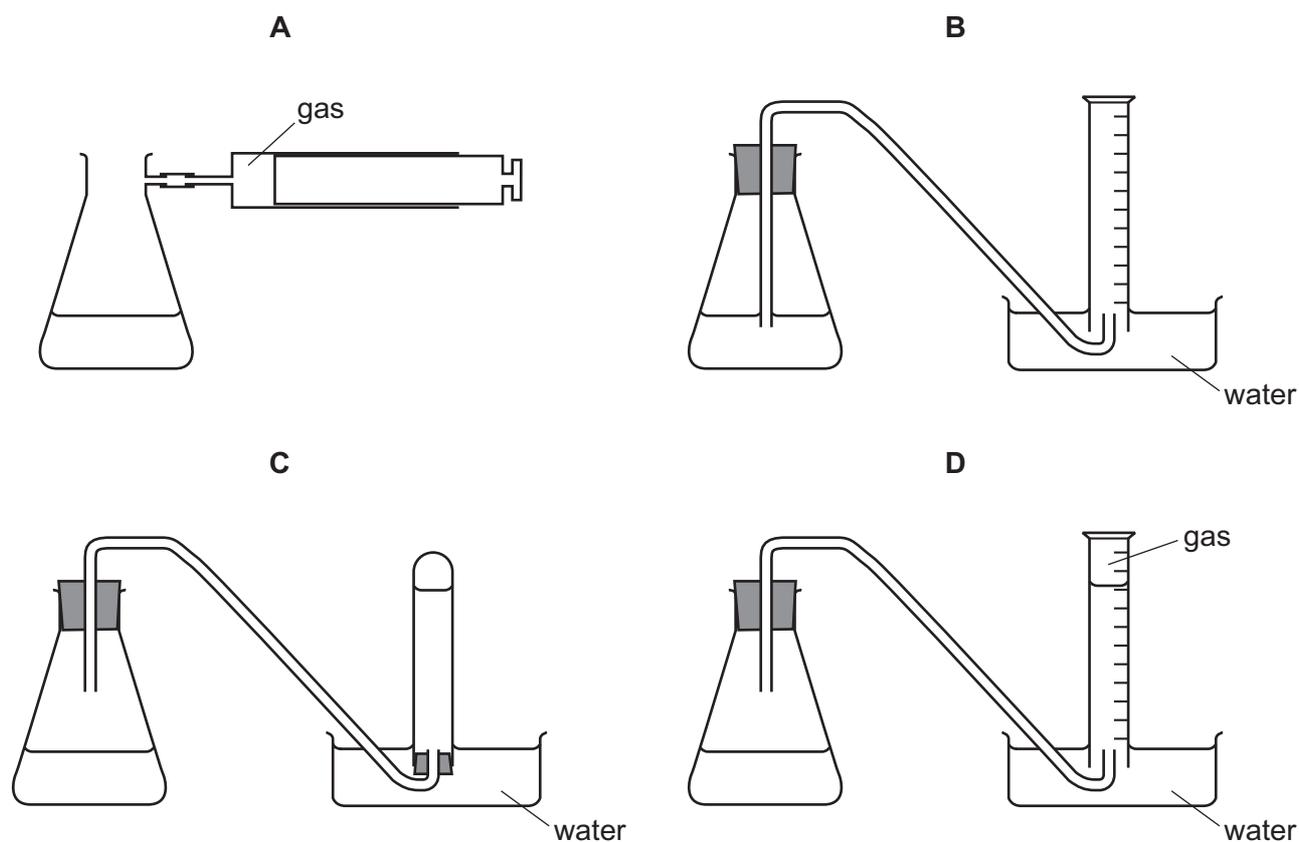
The results are shown.



Which description of the chemical reaction is correct?

- A endothermic then exothermic
- B endothermic only
- C exothermic then endothermic
- D exothermic only

- 19 Which diagram shows apparatus used to investigate the rate of a reaction in which a gas is given off?



- 20 Iron oxide reacts with carbon monoxide.

The word equation for the reaction is:



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.



24 Which process is used to extract copper from copper oxide?

- A Heat the copper oxide on its own.
- B Heat the copper oxide with carbon.
- C Heat the copper oxide with carbon dioxide.
- D Heat the copper oxide with water and then filter.

25 What is a chemical test for water?

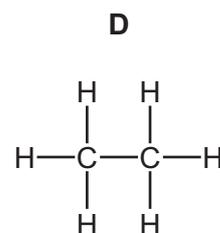
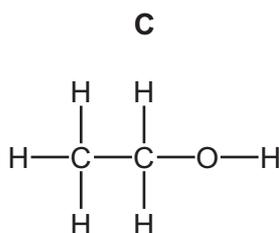
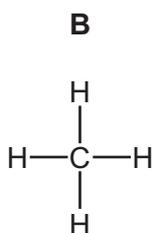
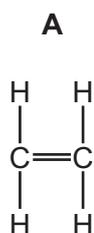
- A It has a boiling point of 100 °C.
- B It has a density of 1 g/cm<sup>3</sup>.
- C It turns anhydrous copper sulfate from white to blue.
- D It turns pink cobalt chloride paper to blue.

26 Gasoline is a hydrocarbon fuel obtained from petroleum.

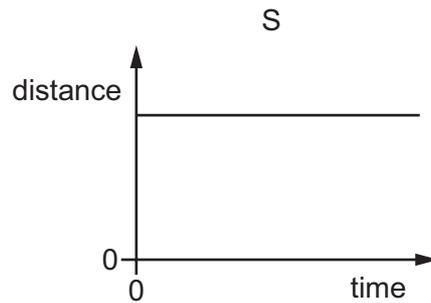
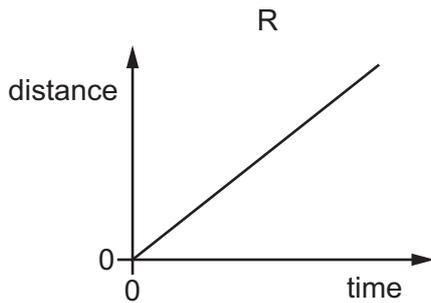
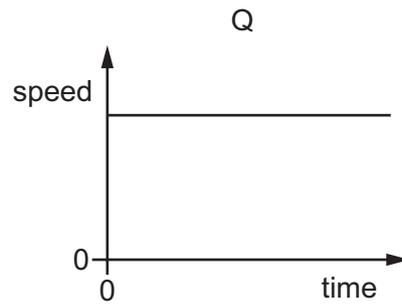
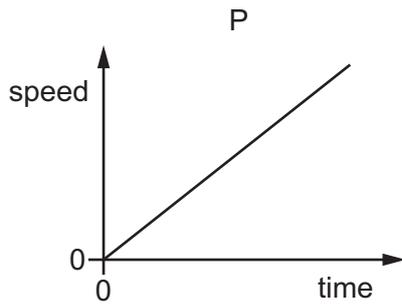
Which statement is correct?

- 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.

27 What is the structure of ethane?



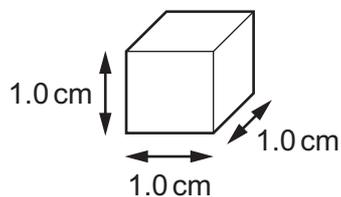
28 Graphs P and Q are speed-time graphs. Graphs R and S are distance-time graphs.



Which of the graphs represent the motion of an object moving with constant speed?

- A** P and S      **B** S only      **C** Q and R      **D** Q only

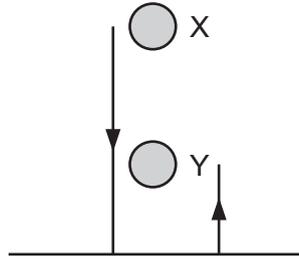
29 A cube of aluminium has sides of length 1.0 cm.



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.

- 30 A ball is released from rest at position X and falls to the ground. It rebounds to a maximum height at position Y, as shown.



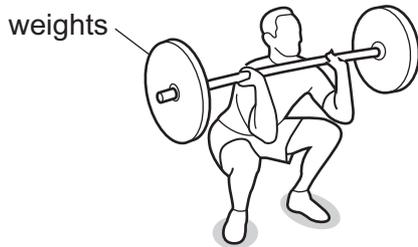
Which statement about the ball at Y is correct?

- A It has less gravitational energy than at X.
- B It has less kinetic energy than at X.
- C It has less sound energy than at X.
- D It has less thermal energy than at X.

31 Weightlifting involves a number of different stages.

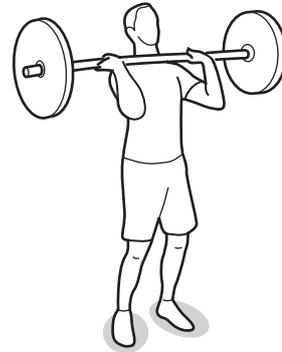
In which stage is **no** work being done on the weights?

**A**



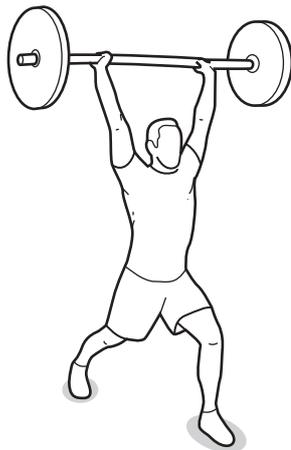
The weights are lifted up off the floor.

**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 scientist investigates two different substances, P and Q.

Substance P completely fills its container but can be compressed.

Substance Q is not in a container but has a definite shape.

In which state is each substance?

	substance P	substance Q
<b>A</b>	gas	liquid
<b>B</b>	gas	solid
<b>C</b>	liquid	gas
<b>D</b>	liquid	solid

**33** 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.

**34** A student investigates a wave.

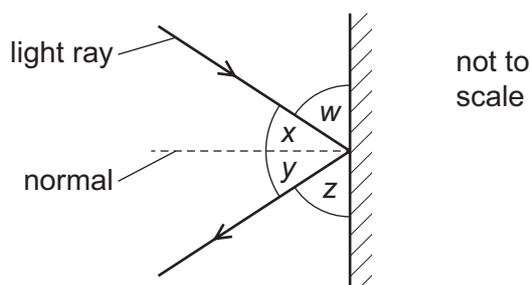
First he measures the distance between one wave crest and the next wave crest.

Next, he counts the number of wave crests passing a fixed point in one second.

Which properties of the wave has the student determined?

- A** the amplitude and the frequency
- B** the amplitude and the speed
- C** the wavelength and the frequency
- D** the wavelength and the speed

- 35 Light from a ray-box strikes a plane mirror and reflects off it.

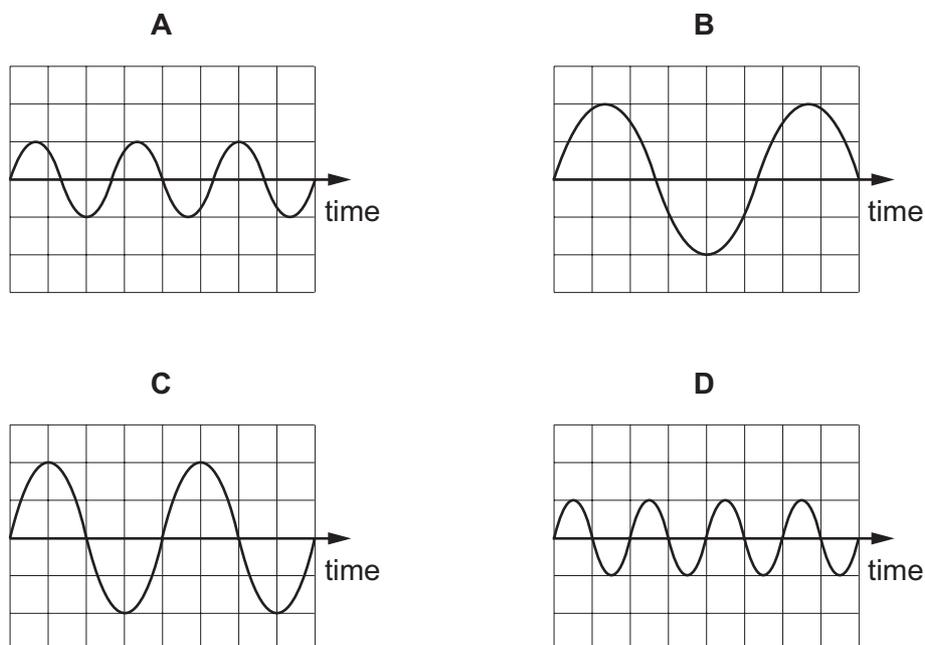


On the diagram, four angles  $w$ ,  $x$ ,  $y$  and  $z$  are indicated.

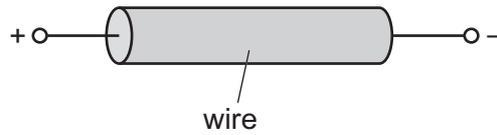
Which equation **must** be correct?

- A  $w = x$       B  $w = z$       C  $x = z$       D  $y = z$
- 36 Which list shows electromagnetic waves in order of decreasing wavelength (largest to smallest)?
- A gamma rays  $\rightarrow$  radio waves  $\rightarrow$  infra-red  $\rightarrow$  microwaves  
 B microwaves  $\rightarrow$  visible light  $\rightarrow$  X-rays  $\rightarrow$  infra-red  
 C radio waves  $\rightarrow$  visible light  $\rightarrow$  ultraviolet  $\rightarrow$  X-rays  
 D X-rays  $\rightarrow$  infra-red  $\rightarrow$  microwaves  $\rightarrow$  visible light
- 37 The diagrams represent four different sound waves. The scales are the same in all the diagrams.

Which sound has the lowest pitch?



- 38 There is a current in a metal wire when a potential difference is applied across its ends. The diagram shows which ends are connected to the positive and negative terminals.



How does the charge flow in the wire?

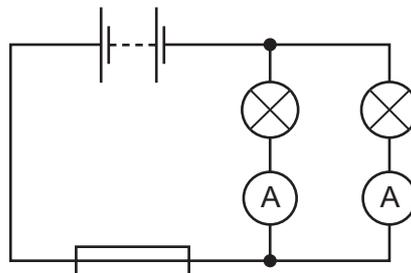
- A** electrons flow from left to right  
**B** electrons flow from right to left  
**C** protons flow from left to right  
**D** protons flow from right to left
- 39 A circuit contains a battery connected to a resistor.



Which values of electromotive force (e.m.f.) and resistance produce the smallest current?

	e.m.f./V	resistance/ $\Omega$
<b>A</b>	6.0	10
<b>B</b>	6.0	20
<b>C</b>	24	80
<b>D</b>	24	160

- 40 Two lamps and two ammeters are connected in the circuit shown. Each ammeter reads 1.0 A.



Which is the most suitable rating for the fuse in this circuit?

- A** 0.5 A      **B** 1 A      **C** 3 A      **D** 13 A



**BLANK PAGE**

---

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge International Examinations Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at [www.cie.org.uk](http://www.cie.org.uk) after the live examination series.

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.

## The Periodic Table of Elements

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

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

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