



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)

* 5 6 4 9 8 9 8 1 2 0 *

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

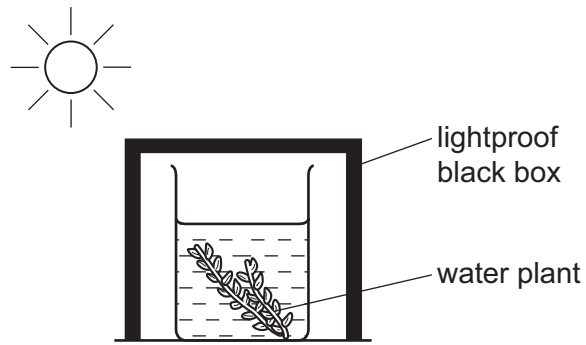
4 A food substance was tested with various reagents. The results of the tests are shown.

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

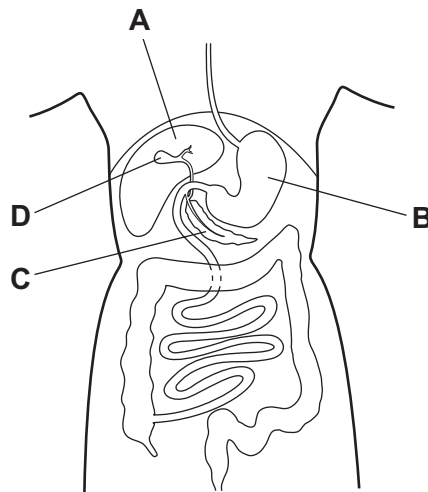
- 5 The diagram shows a water plant surrounded by a black box.



Which change takes place if the black box is removed?

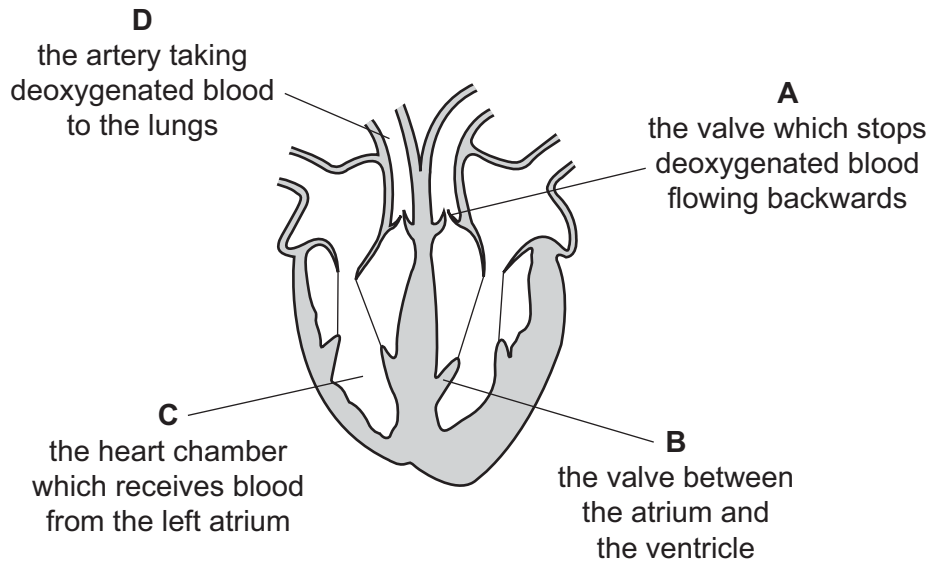
- A Oxygen production increases.
 - B Respiration stops.
 - C Stomata close.
 - D Water uptake decreases.
- 6 The diagram shows part of the human alimentary canal.

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
A	less	less	unchanged	unchanged
B	less	more	less	more
C	more	less	unchanged	more
D	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.

11 The diagram shows a calendar for February and March.

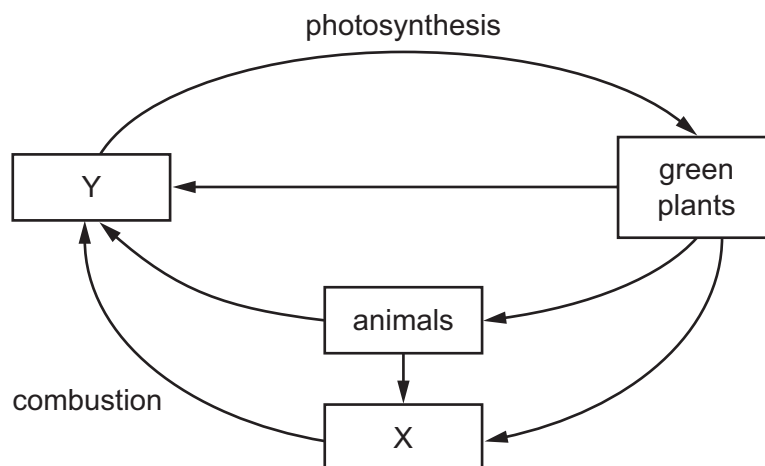
	February				March			
	7	14	21	28	7	14	21	28
1	8	15	22		1	8	15	22
2	9	16	23		2	9	16	23
3	10	17	24		3	10	17	24
4	11	18	25		4	11	18	25
5	12	19	26		5	12	19	26
6	13	20	27		6	13	20	27

Ovulation occurs on 8 February.

When is menstruation most likely to begin?

- A 9 February–11 February
- B 14 February–16 February
- C 21 February–23 February
- D 7 March–9 March

12 The diagram shows part of the carbon cycle.



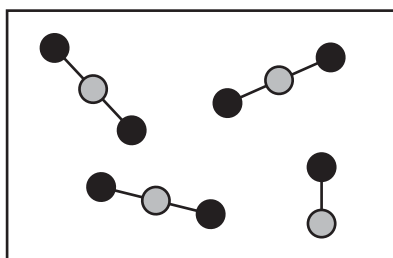
What are X and Y?

	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	✓	x
C	x	✓
D	x	x

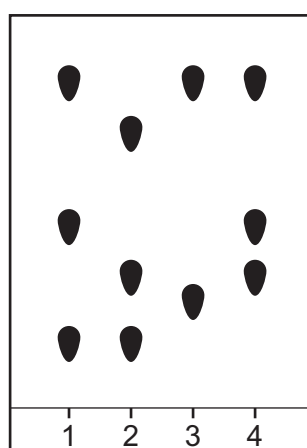
14 The diagram represents a mixture of carbon dioxide, CO_2 , and carbon monoxide, CO .



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 Four dyes are separated using chromatography.

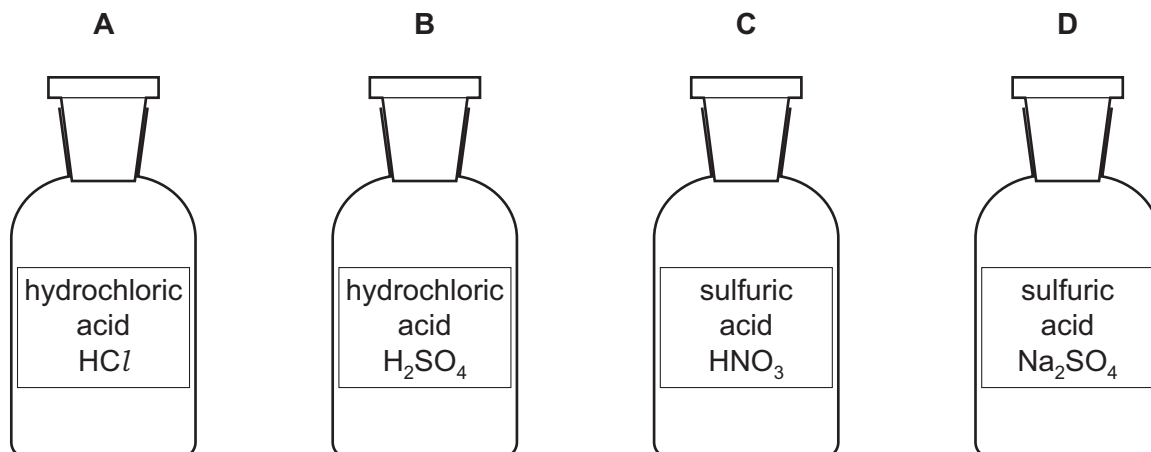
The results are shown.



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 by1..... forms the elements lead and bromine.

Lead is formed at the2..... .

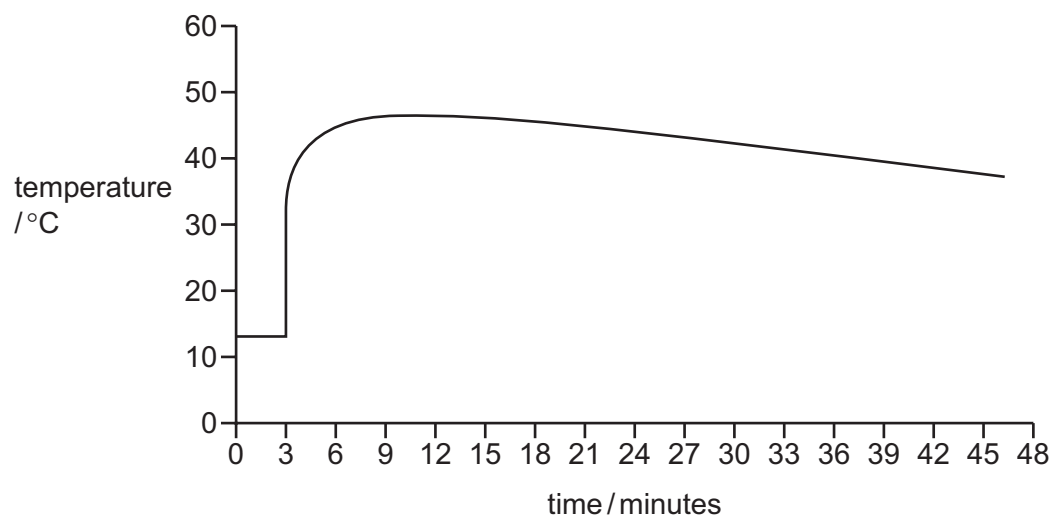
Which words complete gaps 1 and 2?

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

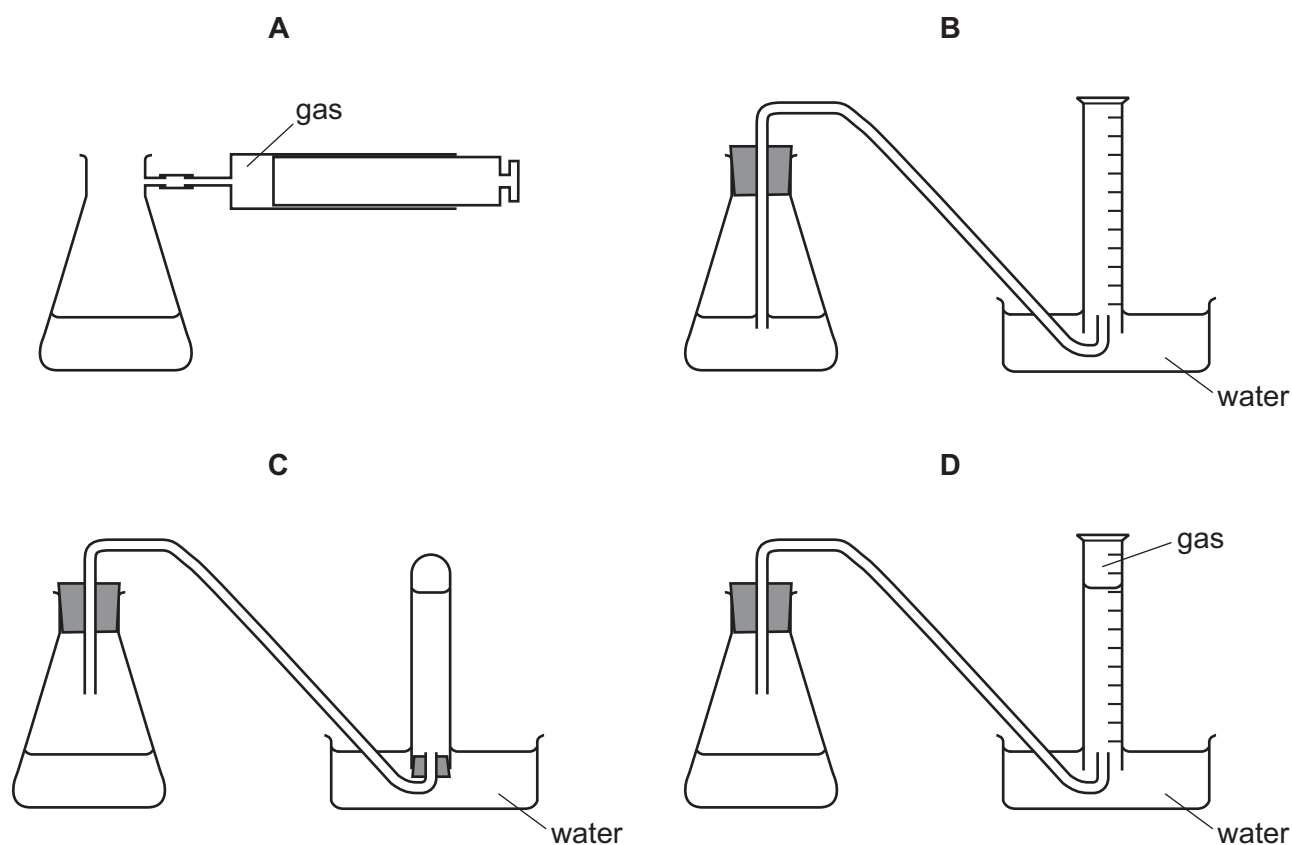
The results are shown.



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.

21 The results of two tests on solid P are shown.

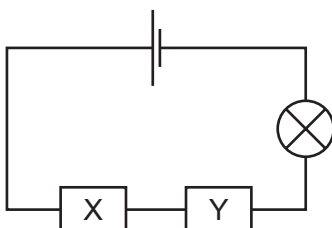
	test	result
1	add aqueous sodium hydroxide to solid	gas given off that turns moist red litmus paper blue
2	dissolve solid in water add dilute aqueous silver nitrate	white precipitate formed

What is P?

- A aluminium carbonate
- B aluminium sulfate
- C ammonium chloride
- D ammonium nitrate

22 Two substances, X and Y, are connected in a circuit as shown.

The lamp lights.

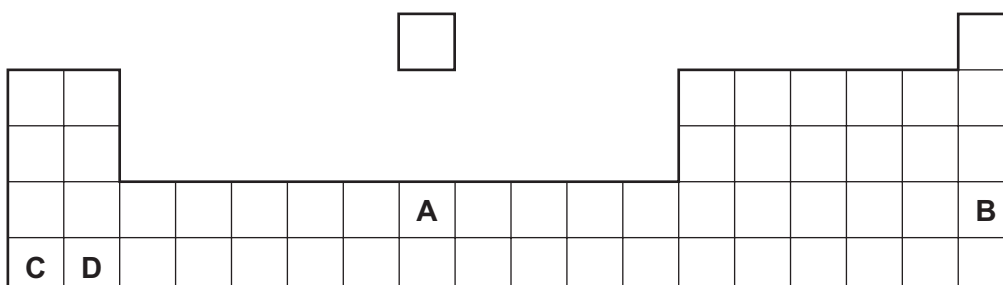


What are X and Y?

	X	Y
A	carbon	sulfur
B	copper	lead
C	copper	sulfur
D	sulfur	lead

23 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?



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?

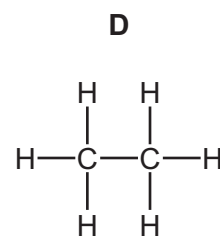
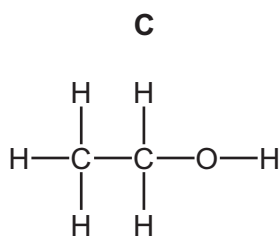
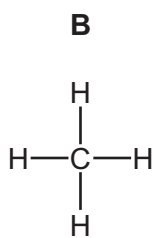
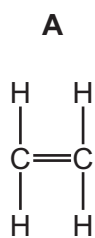
- A It has a boiling point of 100 °C.
- B It has a density of 1 g/cm³.
- C It turns anhydrous copper sulfate from white to blue.
- D It turns pink cobalt chloride paper to blue.

26 Gasoline is a hydrocarbon fuel obtained from petroleum.

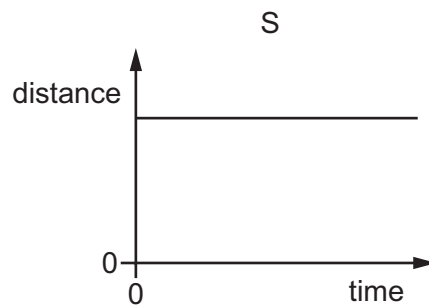
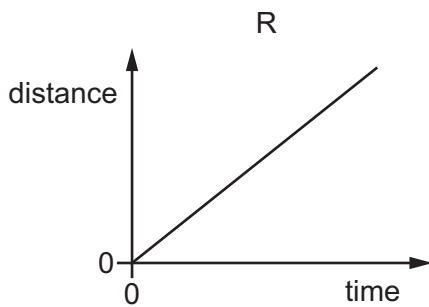
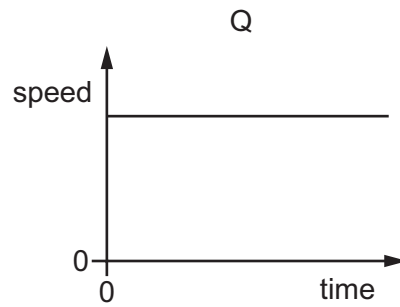
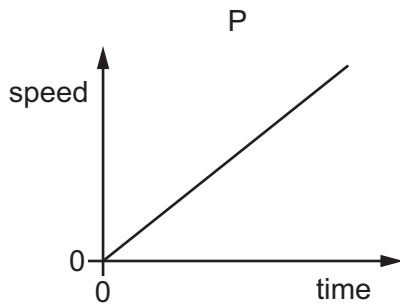
Which statement is correct?

- 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?



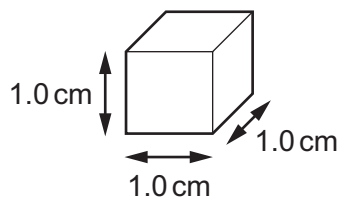
28 Graphs P and Q are speed-time graphs. Graphs R and S are distance-time graphs.



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

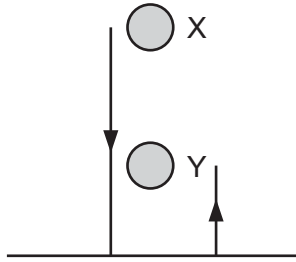
29 A cube of aluminium has sides of length 1.0 cm.



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.



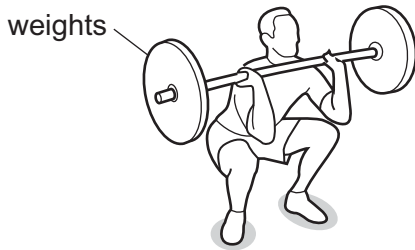
Which statement about the ball at Y is correct?

- 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.

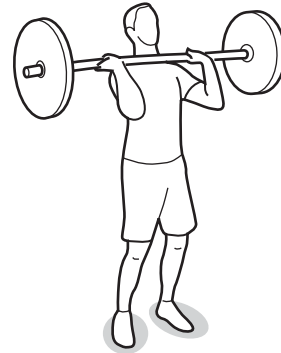
In which stage is **no** work being done on the weights?

A



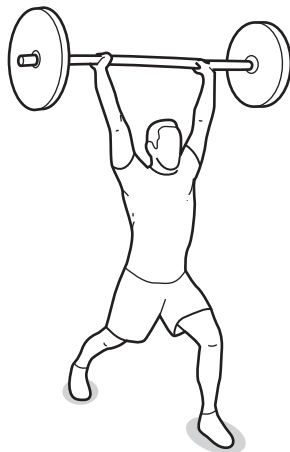
The weights are lifted up off the floor.

B



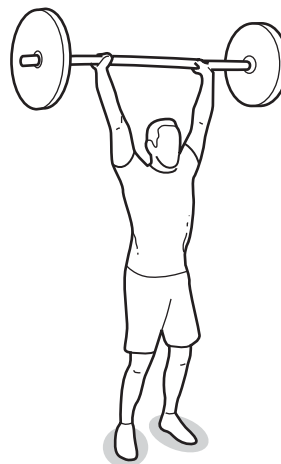
The weights are lifted as the man stands up.

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
A	gas	liquid
B	gas	solid
C	liquid	gas
D	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.

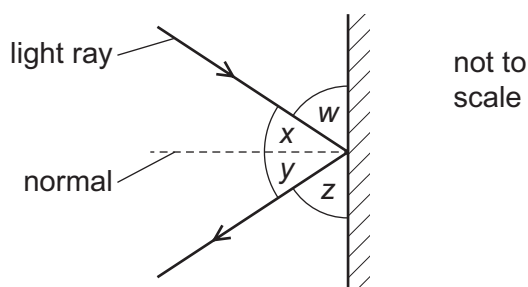
First he measures the distance between one wave crest and the next wave crest.

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.

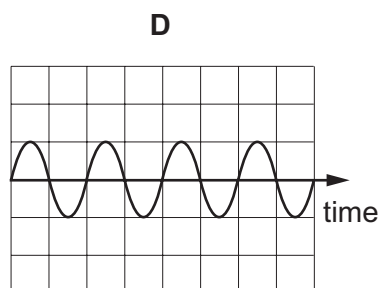
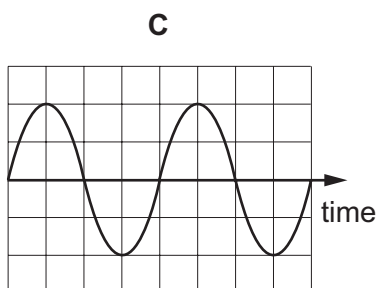
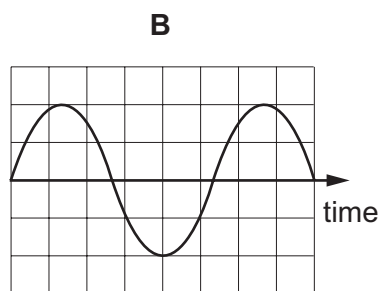
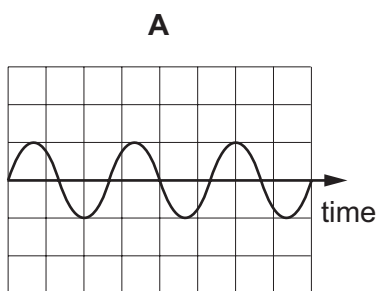


On the diagram, four angles w , x , y and z are indicated.

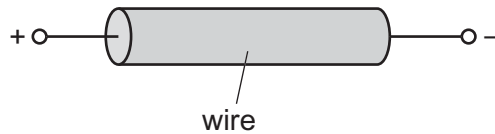
Which equation **must** be correct?

- 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 → radio waves → infra-red → microwaves
B microwaves → visible light → X-rays → infra-red
C radio waves → visible light → ultraviolet → X-rays
D X-rays → infra-red → microwaves → 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?

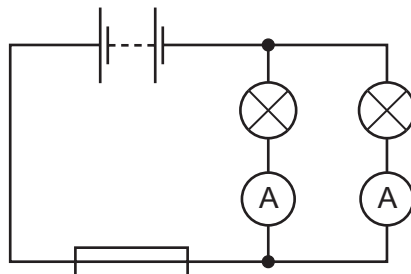
- A** electrons flow from left to right
B electrons flow from right to left
C protons flow from left to right
D protons flow from right to left
- 39 A circuit contains a battery connected to a resistor.



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

	e.m.f./V	resistance/ Ω
A	6.0	10
B	6.0	20
C	24	80
D	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

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The Periodic Table of Elements

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I	II											III	IV	V	VI	VII	VIII																																																																																																																																																																																																																				
3 Li lithium 7	4 Be beryllium 9	<p style="text-align: center;">Key</p> <table border="1"> <tr> <td>1 H hydrogen 1</td> <td>atomic number</td> </tr> <tr> <td></td> <td>atomic symbol</td> </tr> <tr> <td></td> <td>name</td> </tr> <tr> <td></td> <td>relative atomic mass</td> </tr> </table>										1 H hydrogen 1	atomic number		atomic symbol		name		relative atomic mass	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																																																																																																																																																																																		
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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 —	113	114 Fl flerovium —	115	116 Lv livermorium —	117	118 Og oganeson —	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300																														
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 —	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300

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