Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE **0653/11**

Paper 1 Multiple Choice **October/November 2015**

45 minutes

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

READ THESE INSTRUCTIONS FIRST

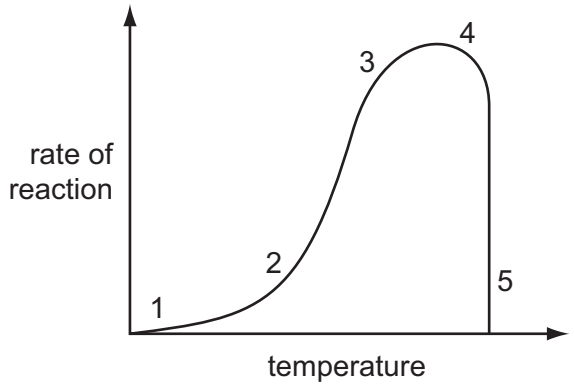
Write in soft pencil.
Do not use staples, paper clips, glue or correction fluid.
Write your name, Centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.
DO **NOT** WRITE IN ANY BARCODES.

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 16.
Electronic calculators may be used.

1 The graph shows the effect of temperature on the rate of an enzyme-controlled reaction.



Where on the graph has all the enzyme been denatured?

A 1 **B** 2 and 3 **C** 3 and 4 **D** 5

2 Which statement describes nutrition and respiration in plants?

A Plants respire only when they are not undergoing nutrition.

B Plants respire using a process called photosynthesis.

C Plants undergo nutrition and respiration at the same time.

D Plants undergo nutrition only when they are not respiring.

3 A careless student has two microscope slides, one of animal cells and one of plant cells. He has lost the labels saying which slide is which.

Which feature in the cells that he can see through the microscope tells him that he is looking at the plant cells?

A cells all surrounded by membranes

B cytoplasm with granules in it

C green dots visible inside the cells

D many cells with a noticeable dark dot inside them

4 A sample of food is tested with Benedict's solution, biuret solution and iodine solution. The results are shown in the table.

test	final colour after test
Benedict's solution	blue
biuret solution	purple / lilac
iodine solution	blue / black

Which substances are present in the food sample tested?

	protein	reducing sugar	starch
A	✓	✓	✓
B	✓	✓	✗
C	✓	✗	✓
D	✗	✓	✓

5 Which chemical is produced from digestion of a fat?

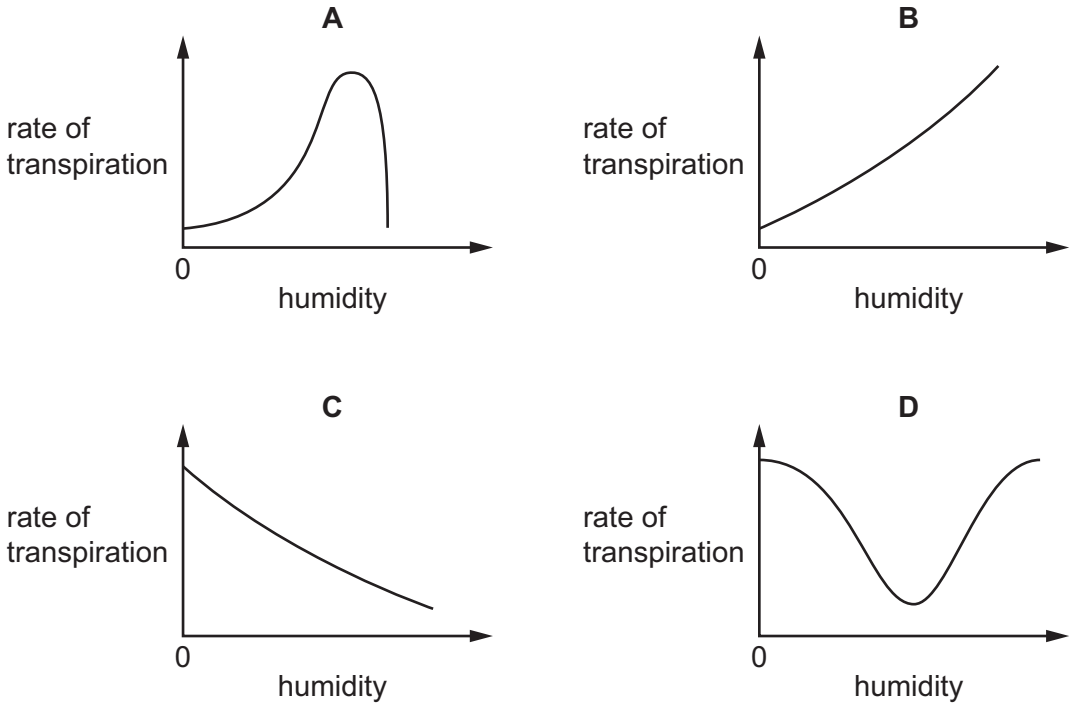
A amino acid

B glycerol

C glycogen

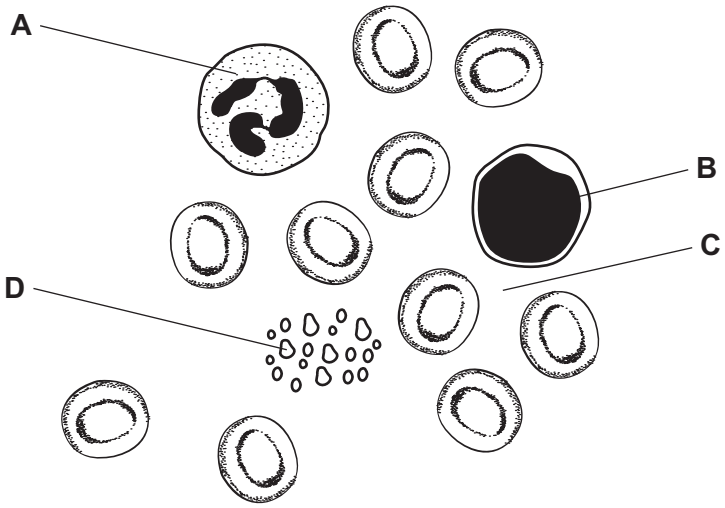
D sugar

6 Which graph shows how atmospheric humidity affects the rate of transpiration of a green plant?



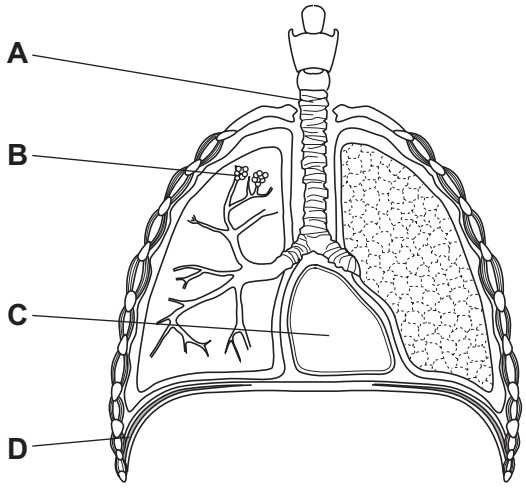
7 The drawing shows some blood, as it appears under the microscope.

Which part carries glucose to muscles?



8 The diagram shows some structures in the human thorax (chest).

Into which part does carbon dioxide pass immediately after leaving the blood?



9 Which row describes the stimulus and response in a plant process?

	name of process	stimulus	plant response
A	geotropism	gravity	root grows down
B	geotropism	light	shoot grows up
C	phototropism	gravity	shoot grows down
D	phototropism	light	root grows up

10 Which row is correct for the hormone adrenaline?

	effect on blood glucose concentration	effect on the pulse rate	organ where adrenaline is destroyed
A	lowered	decreased	kidney
B	lowered	decreased	liver
C	raised	increased	kidney
D	raised	increased	liver

11 Which structure in a flower produces pollen?

A sepal

B stamen

C stigma

D style

12 Where in the female human reproductive system is the hormone oestrogen produced?

A cervix

B ovary

C uterus

D vagina

13 Fresh sewage runs into a river. Why does this reduce the fish population in the river?

A It brings organisms that feed on fish.

B It carries bacteria that reduce oxygen concentration.

C It decreases the growth of algae.

D It makes the water too cloudy for fish to see.

14 Which statement about atoms and molecules is correct?

A Atoms gain or lose electrons to become molecules.

B Atoms of the same element contain the same number of molecules.

C Molecules are the simplest unit of an atom.

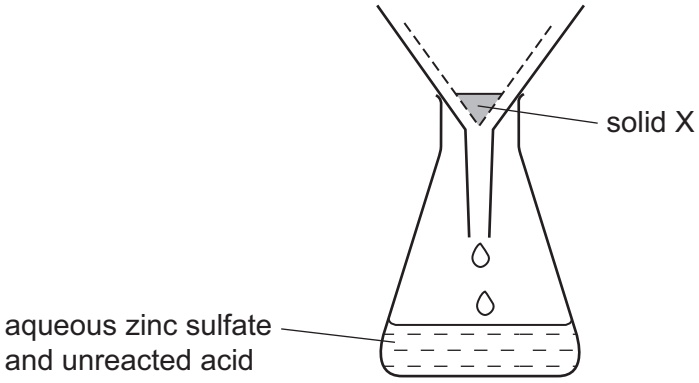
D Molecules contain atoms which are covalently bonded.

[Turn over

15 In an experiment, a mixture of 0.5 g of copper and 3 g of zinc is added to an excess of dilute sulfuric acid.

The copper acts as a catalyst.

After all the zinc has dissolved, the resulting mixture is filtered.



What is solid X and what is its mass?

	solid X	mass of pure X
A	copper	less than 0.5 g
B	copper	0.5 g
C	copper(II) oxide	0.5 g
D	copper(II) oxide	greater than 0.5 g

16 Element Y has a proton number of 18 and a nucleon number of 40.

Which statements about element Y are correct?

1 It has 40 neutrons in its nucleus.

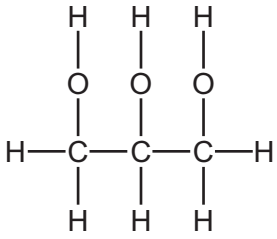
2 It has 22 electrons.

3 It is unreactive.

4 It is in Group 0 of the Periodic Table.

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

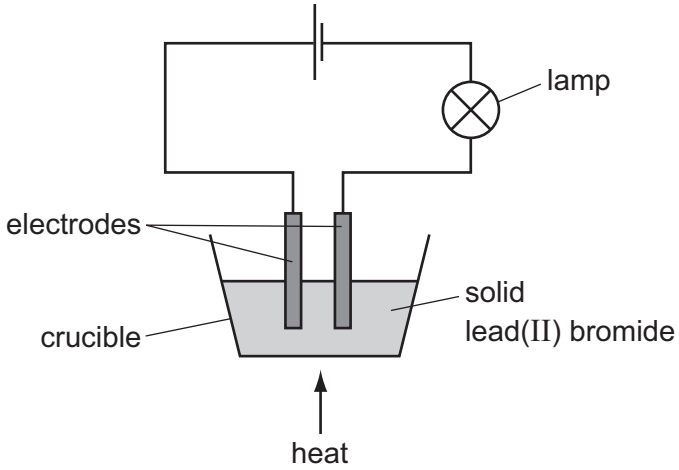
17 The structure of a compound is shown.



What is the formula of this compound?

A $C_3H_5O_3$ **B** $C_3H_6O_3$ **C** C_3H_8O **D** $C_3H_8O_3$

18 The apparatus shown is set up.



The crucible needs to be heated for the lamp to give out light.

Why is heat needed?

A An exothermic reaction takes place in the crucible.

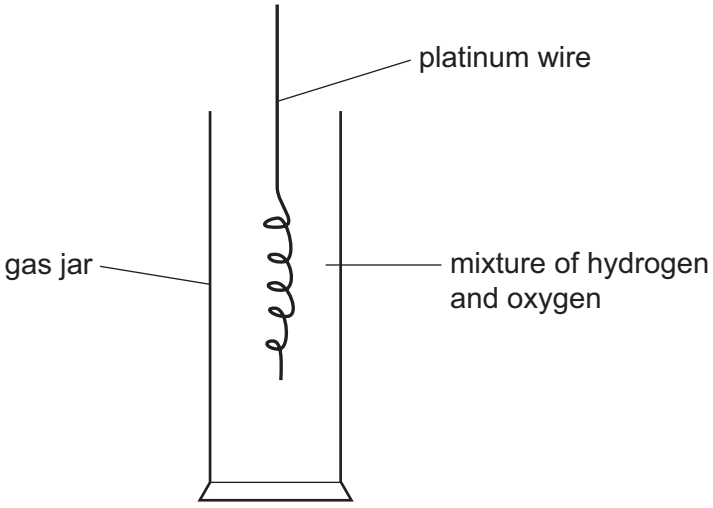
B Electrodes only conduct electricity when hot.

C Heat causes the lead(II) bromide to react with air.

D The lead(II) bromide must be molten.

[Turn over

19 The diagram shows a platinum wire being used to catalyse the reaction between hydrogen and oxygen.



An explosive squeak is heard.

Which statement is correct?

A An acidic gas is formed.

B Energy is released.

C Hydrogen is reduced.

D Platinum is oxidised.

20 Magnesium reacts with steam to form magnesium oxide and hydrogen gas.

$$Mg + H_2O \rightarrow MgO + H_2$$

Which statement is correct?

A Hydrogen gas is reduced.

B Magnesium is oxidised.

C Magnesium is reduced.

D Water is oxidised.

21 Compound X reacts with dilute nitric acid to give a colourless gas which turns limewater milky.

A solution of compound X reacts with sodium hydroxide solution to form a pale blue precipitate.

What is X?

A copper(II) carbonate

B copper(II) chloride

C iron(II) carbonate

D iron(II) chloride

22 A substance reacts with dilute acid, producing a gas.

The gas ignites with a pop when tested with a lighted splint.

What is the substance?

A copper

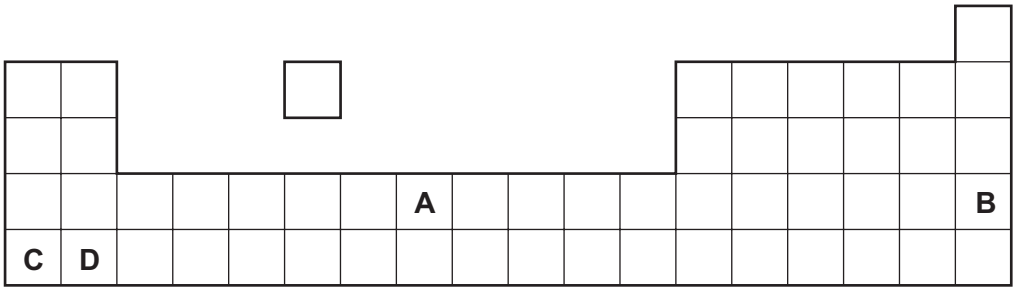
B copper(II) oxide

C magnesium

D magnesium carbonate

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 Chlorine, bromine and iodine are elements in Group VII of the Periodic Table.

Which trend is observed going down Group VII?

A Each element has the same physical state.

B The colour of the element becomes lighter.

C The reactivity of the element decreases.

D The state of the element changes from solid to liquid to gas.

25 Which element is less reactive than hydrogen?

A copper

B iron

C magnesium

D zinc

26 What are the approximate percentages by volume of nitrogen and oxygen in clean air?

	nitrogen	oxygen
A	1	99
B	20	80
C	80	20
D	99	1

27 Petroleum is a mixture of hydrocarbons.

Which method is used to separate these hydrocarbons?

A crystallisation

B distillation

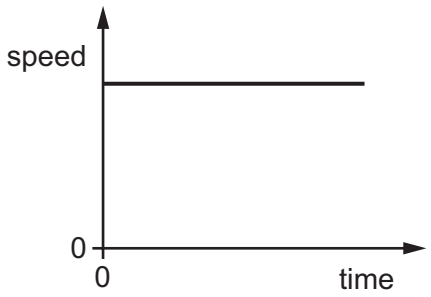
C filtration

D fractional distillation

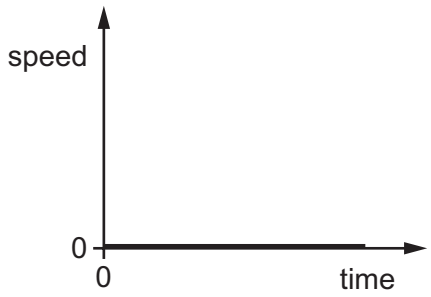
28 A car is moving downhill along a road at a constant speed.

Which graph is the speed / time graph for the car?

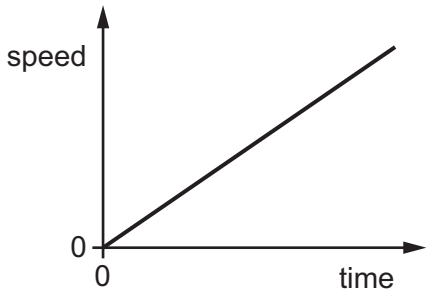
A



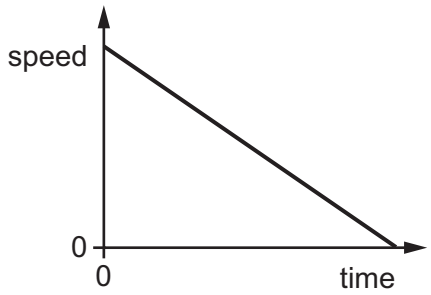
B



C



D



29 Which statement about mass and weight is correct?

A Mass and weight are both forces.

B Mass is a force and weight is not.

C Neither mass nor weight is a force.

D Weight is a force and mass is not.

30 An object has a mass of 75 g and a volume of 15 cm^3.

What is its density?

A 0.20 g/cm^3 **B** 5.0 g/cm^3 **C** 60 g/cm^3 **D** 90 g/cm^3

31 What is the unit for work and what is the unit for power?

	work	power
A	J	N
B	J	W
C	N	W
D	W	J

[Turn over

32 Which energy change takes place when a block of wood slows down as it slides across a rough horizontal table?

A chemical energy to kinetic energy

B gravitational energy to kinetic energy

C gravitational energy to thermal energy

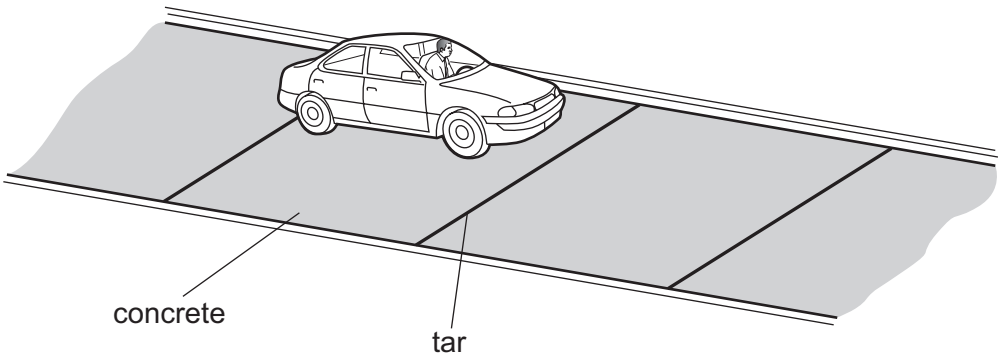
D kinetic energy to thermal energy

33 A beaker of water is at room temperature. Some of the water changes from a liquid into a gas. As a result, the temperature of the remaining water changes.

What is the name for this change of state and how does the temperature change?

	change of state	how temperature changes
A	condensation	decreases
B	condensation	increases
C	evaporation	decreases
D	evaporation	increases

34 Concrete roads are laid in sections and the gaps between sections are filled with soft tar.



Why is this done?

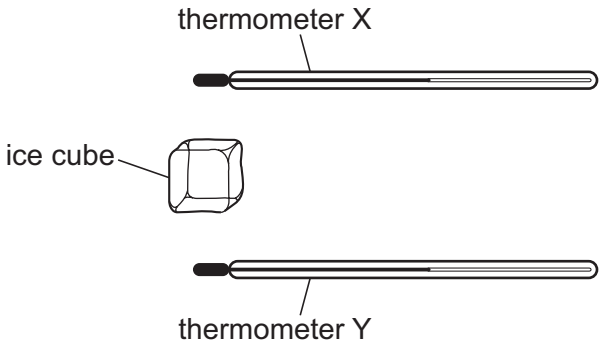
A to allow for expansion and contraction of the concrete

B to allow the tar to radiate heat from the road

C to increase the density of the concrete used

D to reduce the mass of concrete used

35 Thermometer X is held above an ice cube and thermometer Y is held an equal distance below the ice cube. After several minutes, the reading on one thermometer changes. The ice cube has not melted.

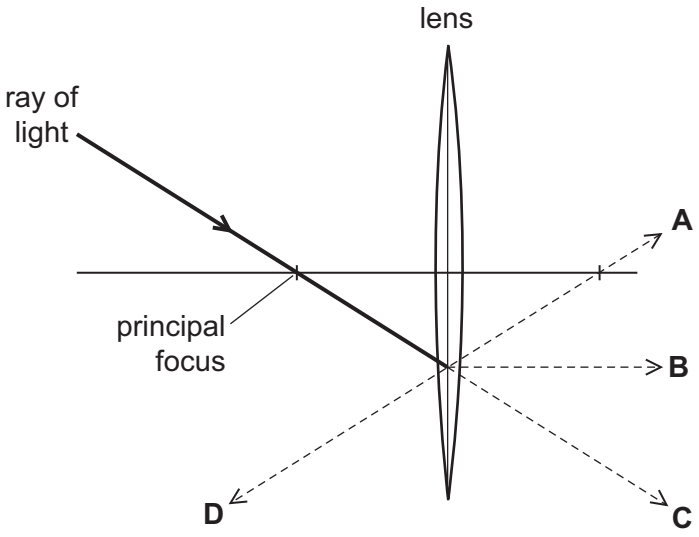


The reading of which thermometer changes, and why?

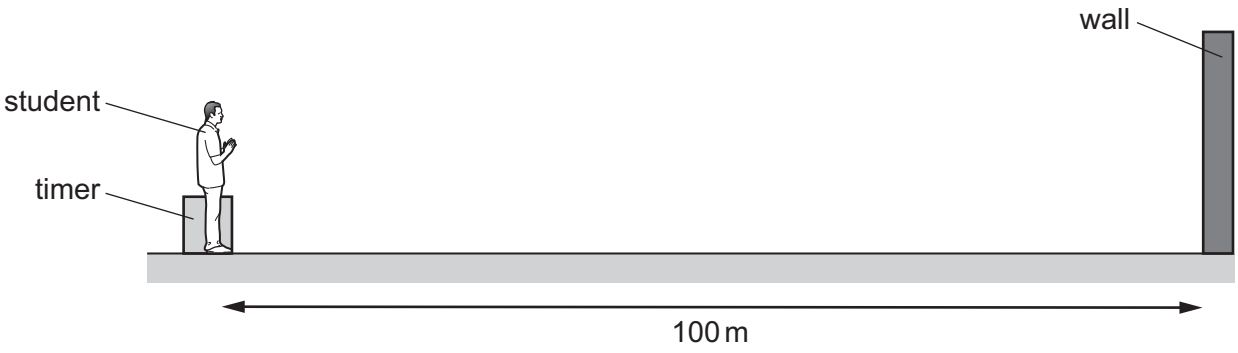
	thermometer	reason
A	X	cool air rises from the ice cube
B	X	warm air rises from the ice cube
C	Y	cool air falls from the ice cube
D	Y	warm air falls from the ice cube

36 The diagram shows the path of a ray of light passing through a principal focus of a lens.

Which labelled line shows the direction of the ray after it leaves the lens?



37 A student measures the speed of sound. He claps his hands and the sound reflects from a wall which is 100 m away from him.



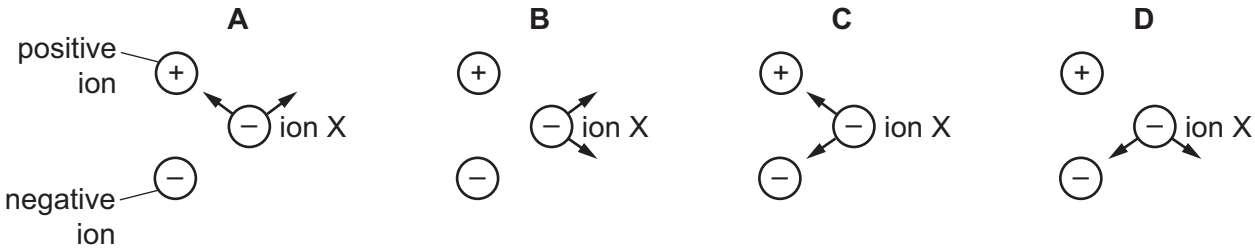
An electronic timer detects the echo of the sound 0.60 s after it is made.

Which calculation should the student use to determine the speed of sound?

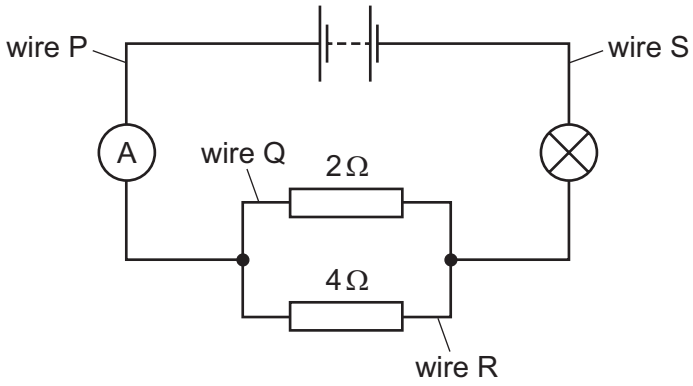
A $\frac{100}{0.60}$ m/s **B** $\frac{100}{1.2}$ m/s **C** $\frac{200}{0.30}$ m/s **D** $\frac{200}{0.60}$ m/s

38 A negative ion X is close to a positive ion and another negative ion. Electrical forces act on ion X because of the charges in the other two ions.

Which diagram shows the directions of the two forces acting on ion X?



39 The circuit diagram includes two resistors connected in parallel.



Which statement is correct?

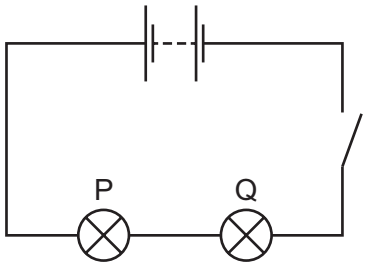
A The current in wire P is equal to the current in wire Q.

B The current in wire P is greater than the current in wire R.

C The current in wire Q is greater than the current in wire S.

D The current in wire R is equal to the current in wire S.

40 Two identical lamps P and Q are connected in a circuit as shown in the diagram.



The circuit is now switched on.

Which statement is correct?

A Each lamp can be switched off independently.

B If lamp Q breaks, lamp P stays alight.

C Lamp P is brighter than lamp Q.

D The current is the same in both lamps.

DATA SHEET
The Periodic Table of the Elements

Group																		
I	II										III	IV	V	VI	VII	0
																4 He Helium 2
					1 H Hydrogen 1											
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 Sulfur 16	35.5 Cl Chlorine 17	40 Ar Argon 18
39 K Potassium 19	40 Ca Calcium 20	45 Sc Scandium 21	48 Ti Titanium 22	51 V Vanadium 23	52 Cr Chromium 24	55 Mn Manganese 25	56 Fe Iron 26	59 Co Cobalt 27	59 Ni Nickel 28	64 Cu Copper 29	65 Zn Zinc 30	70 Ga Gallium 31	75 As Arsenic 33	79 Se Selenium 34	80 Br Bromine 35	84 Kr Krypton 36
85 Rb Rubidium 37	88 Sr Strontium 38	89 Y Yttrium 39	91 Zr Zirconium 40	93 Nb Niobium 41	96 Mo Molybdenum 42	Tc Technetium 43	101 Ru Ruthenium 44	103 Rh Rhodium 45	106 Pd Palladium 46	108 Ag Silver 47	112 Cd Cadmium 48	115 In Indium 49	122 Sb Antimony 51	128 Te Tellurium 52	127 I Iodine 53	131 Xe Xenon 54
133 Cs Caesium 55	137 Ba Barium 56	139 La Lanthanum 57 *	178 Hf Hafnium 72	181 Ta Tantalum 73	184 W Tungsten 74	186 Re Rhenium 75	190 Os Osmium 76	192 Ir Iridium 77	195 Pt Platinum 78	197 Au Gold 79	201 Hg Mercury 80	204 Tl Thallium 81	207 Pb Lead 82	209 Bi Bismuth 83	209 Po Polonium 84	210 At Astatine 85	222 Rn Radon 86
223 Fr Francium 87	226 Ra Radium 88	227 Ac Actinium 89 †														

140 Ce Cerium 58	141 Pr Praseodymium 59	144 Nd Neodymium 60	147 Pm Promethium 61	150 Sm Samarium 62	152 Eu Europium 63	157 Gd Gadolinium 64	159 Tb Terbium 65	162 Dy Dysprosium 66	165 Ho Holmium 67	167 Er Erbium 68	169 Tm Thulium 69	173 Yb Ytterbium 70	175 Lu Lutetium 71
232 Th Thorium 90	231 Pa Protactinium 91	238 U Uranium 92	237 Np Neptunium 93	244 Pu Plutonium 94	243 Am Americium 95	247 Cm Curium 96	247 Bk Berkelium 97	251 Cf Californium 98	252 Es Einsteinium 99	257 Fm Fermium 100	258 Md Mendelevium 101	259 No Nobelium 102	260 Lr Lawrencium 103

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

Key

a	a = relative atomic mass
X	X = atomic symbol
b	b = proton (atomic) number

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