Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CO-ORDINATED SCIENCES **0654/12**

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)

8402476059

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.

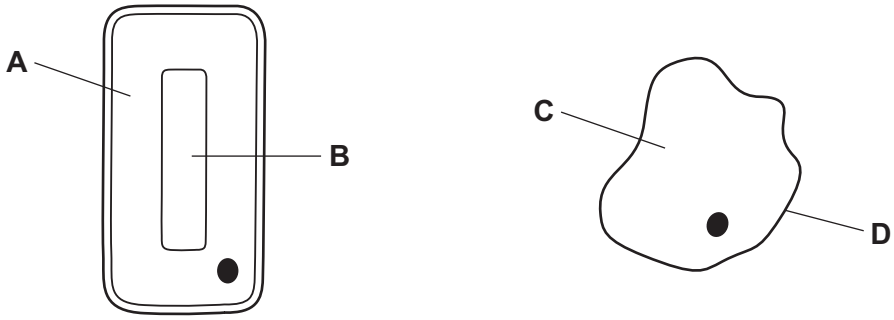
Read the instructions on the Answer Sheet very carefully.

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 The diagram shows two cells.

Which labelled part might contain chloroplasts?



2 Some bacteria live in acidic, hot springs.

What are the optimum conditions for the enzymes of these bacteria?

A 20 °C and pH 4

B 20 °C and pH 9

C 80 °C and pH 4

D 80 °C and pH 9

3 Which element is found in proteins but **not** in carbohydrates and fats?

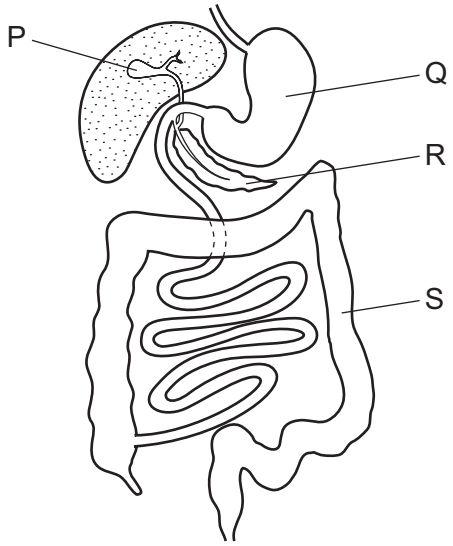
A carbon

B hydrogen

C nitrogen

D oxygen

4 The diagram shows part of the digestive system.



Which of the labelled parts produce digestive enzymes, absorb water and store bile?

	produce digestive enzymes	absorb water	store bile
A	P	Q	R
B	Q	R	P
C	R	S	P
D	S	P	R

5 Plants transport various substances through their xylem and phloem tissues.

If the contents of both tissues are analysed, which substance would be found only in phloem?

A magnesium ions

B nitrate ions

C sugars

D water

6 A boy is frightened, and his heart rate rises and his pupils dilate.

Following this response, which blood vessel carries the adrenaline to the organ where it is destroyed?

A hepatic artery

B pulmonary artery

C renal artery

D vena cava

7 What is meant by *respiration*?

A breakdown of protein

B sweating to lose heat

C the function of lungs

D the release of energy

8 During gas exchange in human lungs, which gases show a net diffusion into or out of blood capillaries?

	carbon dioxide	nitrogen	oxygen
A	✓	✓	✗
B	✓	✗	✓
C	✗	✓	✗
D	✗	✗	✓

9 To which environmental stimulus is a plant root responding when it grows downwards?

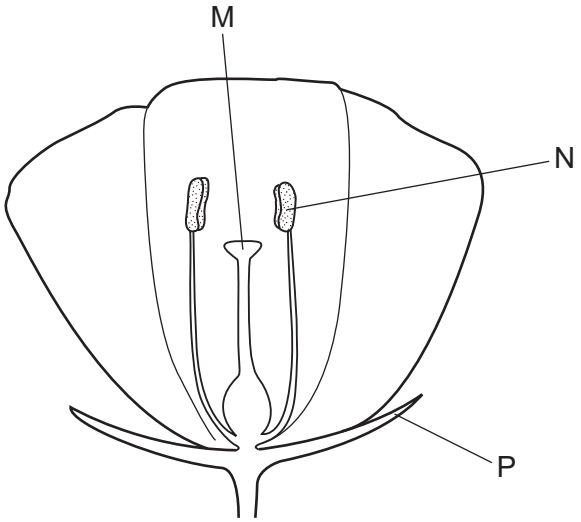
A a decrease in soil water content

B light falling on the leaves of the plant

C rising temperature

D the force of gravity

10 The diagram shows a section through a flower.



Which row identifies M, N and P?

	M	N	P
A	sepal	stamen	stigma
B	sepal	stigma	stamen
C	stigma	sepal	stamen
D	stigma	stamen	sepal

11 A man breeds small mammals in which the fur colour is black or white. The allele for white is dominant to black.

If he chooses a pair of heterozygous white mammals to breed together, which proportion of the offspring mammals will be black?

A none of them

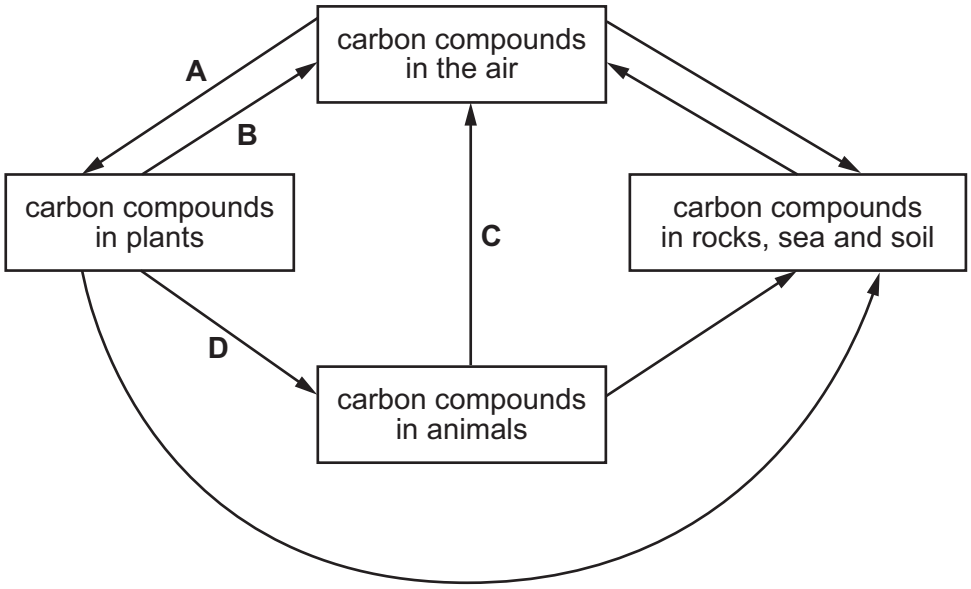
B about a quarter

C about half

D all of them

12 The diagram shows part of the carbon cycle.

Which arrow represents plant respiration?



13 What is **not** an effect of deforestation?

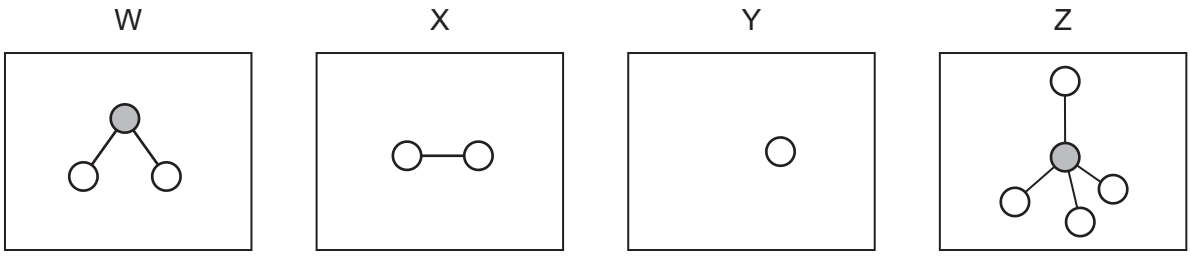
A carbon dioxide build-up in the atmosphere

B habitat loss

C soil loss

D species conservation

14 W, X, Y and Z are diagrams representing atoms and molecules.



Which statement is correct?

A W and Z are molecules and X and Y are atoms.

B W, X and Z are molecules and Y is an atom.

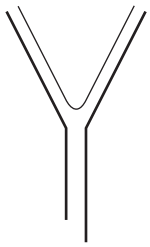
C W, Y and Z are molecules and X is an atom.

D X, Y and Z are molecules and W is an atom.

15 Hexane and octane are liquid hydrocarbons that mix together.

Which apparatus is used to separate a mixture of these two liquids?

A



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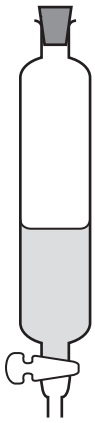

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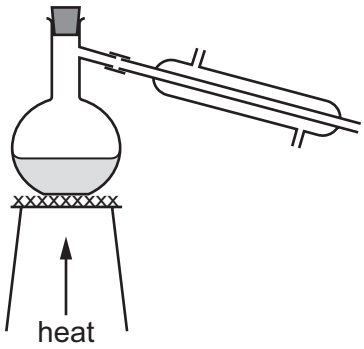

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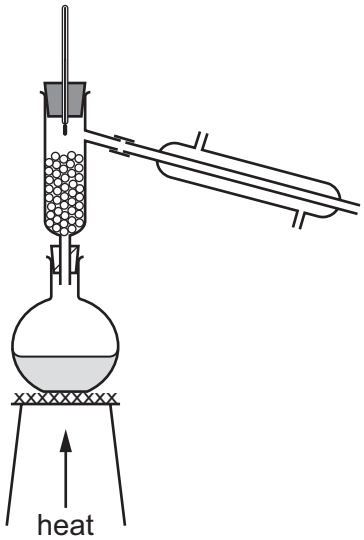


16 Which process is a physical change?

A dissolving calcium carbonate in dilute nitric acid

B dissolving calcium in water

C dissolving ethanol in water

D dissolving magnesium in dilute hydrochloric acid

17 Cryolite is a mineral which contains aluminium, sodium and fluorine.

It contains twice as many fluorine atoms as sodium atoms.

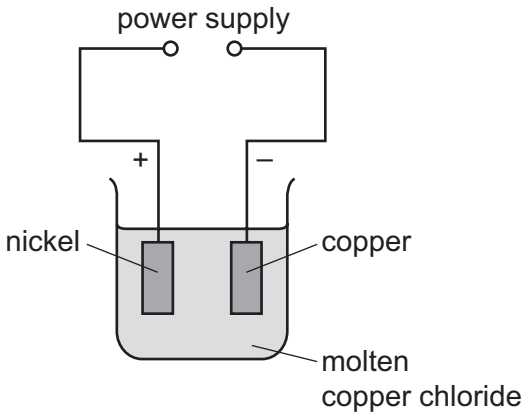
It contains three times as many sodium atoms as aluminium atoms.

What is the formula of cryolite?

A $NaAl_3F_6$ **B** Na_2AlF_4 **C** Na_3AlF_6 **D** Na_3AlF_4

18 Which diagram shows equipment used to electroplate nickel with copper?

A



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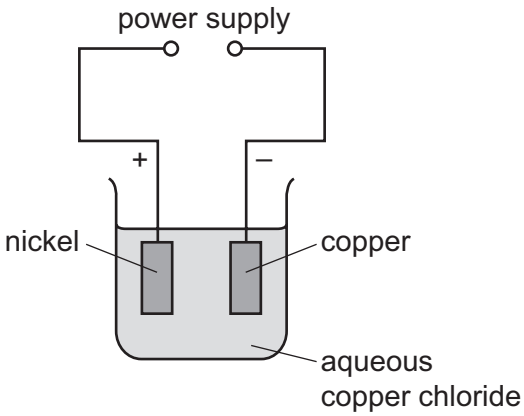

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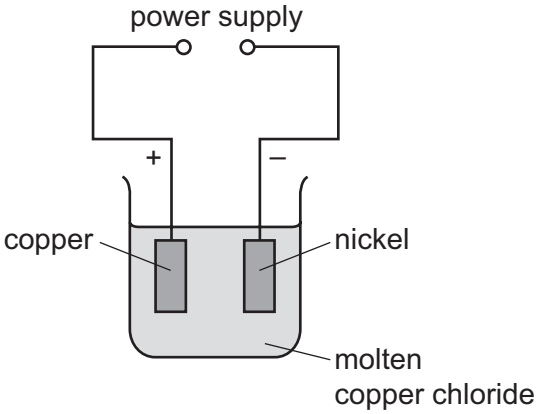

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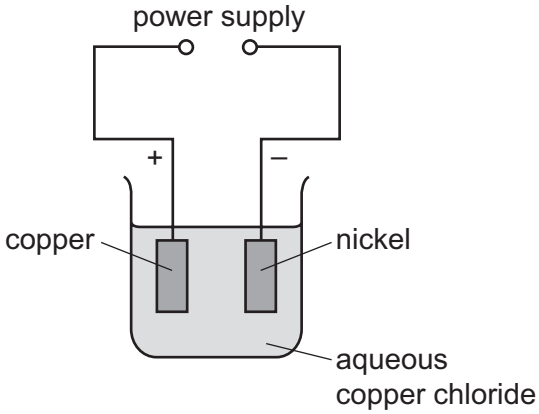


19 Lime is manufactured from calcium carbonate.

Which type of reaction is involved in this process?

A endothermic

B neutralisation

C precipitation

D reduction

20 Dilute sulfuric acid reacts with a piece of zinc.

Which change does **not** increase the rate of reaction?

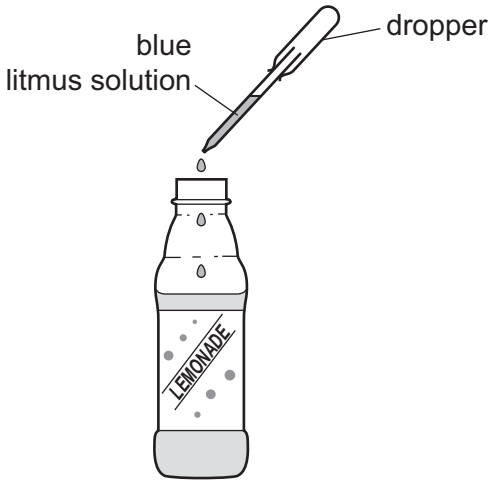
A Use a catalyst.

B Use a larger volume of dilute sulfuric acid.

C Use an equal volume of more concentrated sulfuric acid.

D Use the same mass of powdered zinc.

21 Lemonade turns blue litmus solution red.



What does this colour change show about the lemonade?

A It is acidic.

B It is alkaline.

C It is fizzy.

D It is neutral.

22 Which description of the Group I elements is correct?

A relatively hard metals

B relatively soft metals

C low melting point non-metals

D unreactive gases

23 Which substance is used to extract lead from its ore?

A carbon

B carbon dioxide

C nitrogen

D oxygen

24 Water is purified by chlorination and filtration.

Which statement is correct?

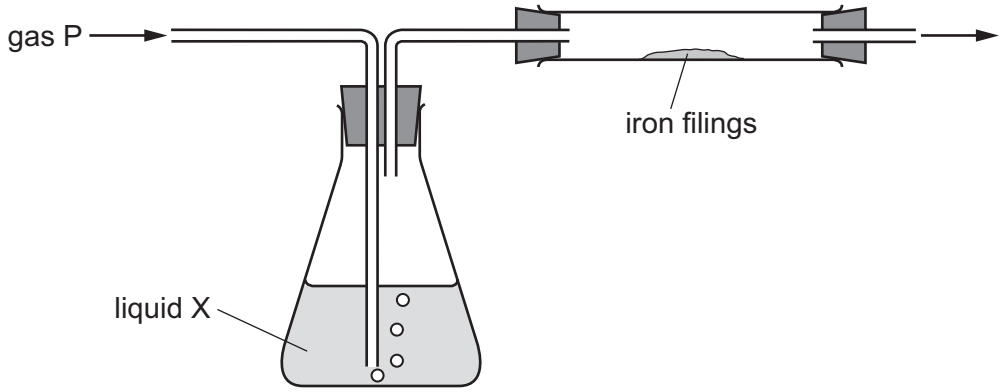
A Chlorination destroys microbes and filtration removes insoluble particles.

B Chlorination destroys microbes and filtration removes soluble particles.

C Chlorination removes insoluble particles and filtration destroys microbes.

D Chlorination removes insoluble particles and filtration removes soluble particles.

25 The diagram shows gas P being passed through liquid X and over iron filings.



Which gas and liquid cause the iron to rust?

	gas P	liquid X
A	nitrogen	concentrated sulfuric acid (a drying agent)
B	nitrogen	water
C	oxygen	concentrated sulfuric acid (a drying agent)
D	oxygen	water

26 Which chemical is used to reduce the acidity of soil?

A ammonium nitrate

B calcium oxide

C magnesium sulfate

D potassium chloride

27 Poly(ethene) is made from many small molecules.

What are the small molecules called?

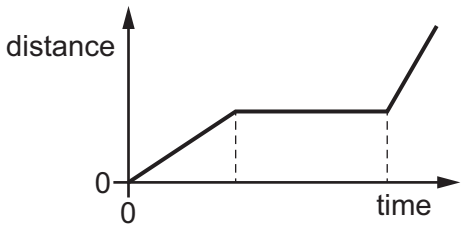
A alkanes

B fractions

C monomers

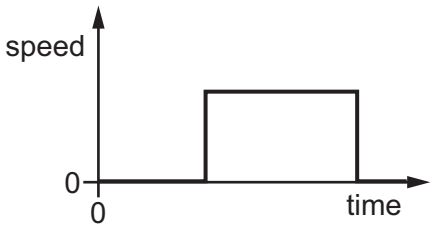
D solvents

28 The diagram shows a distance-time graph for a journey.



Which is the speed-time graph for this journey?

A



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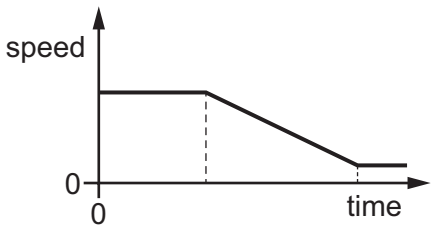

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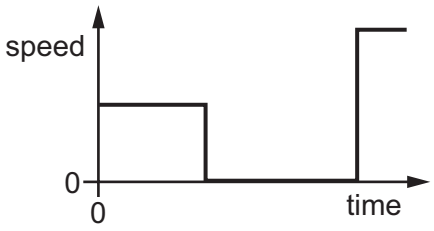

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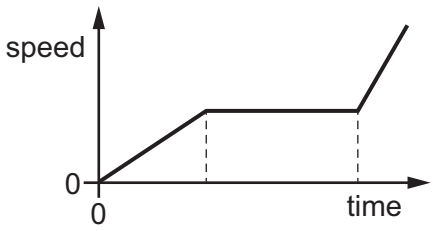


29 A car is travelling along a straight, horizontal road at constant speed.

Which statement about forces on the car is correct?

A There are no horizontal forces acting on the car.

B There is a resultant force on the car in the direction of its movement.

C There is a resultant force on the car in the direction opposite to its movement.

D There is no resultant force acting on the car.

30 A ball is thrown vertically upwards. The ball rises, stops, falls back down and hits soft ground without bouncing.

Which energy transfers occur, starting just after the ball is released?

A kinetic to potential to kinetic to chemical

B kinetic to potential to kinetic to thermal

C potential to kinetic to potential to chemical

D potential to kinetic to potential to thermal

31 Which statement describes molecules in a solid?

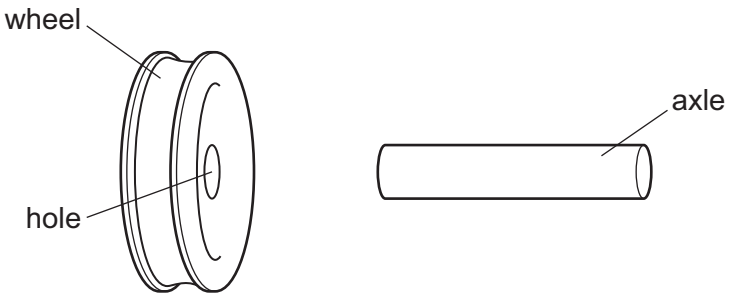
A They are close together and vibrate about fixed positions.

B They do not vibrate but move at high speeds in straight lines.

C They do not vibrate but can change places with each other.

D They vibrate and can change places with each other.

32 An axle is slightly larger than the hole in a wheel made from the same metal.



How could an engineer fit the wheel onto the axle?

A cool the axle only

B cool the axle and cool the wheel by the same temperature change

C heat the axle only

D heat the axle and heat the wheel by the same temperature change

33 There is a vacuum between the double walls of a vacuum flask.

Which types of heat transfer are reduced by the vacuum?

A conduction, convection and radiation

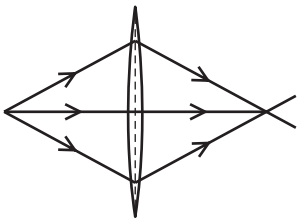
B conduction and convection only

C conduction and radiation only

D convection and radiation only

34 Which diagram shows how a real image is formed by a convex lens?

A



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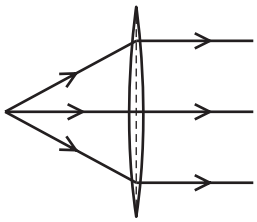

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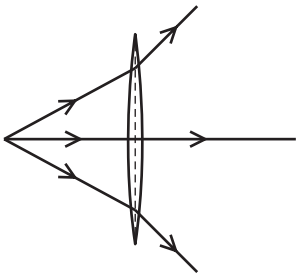

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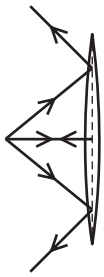
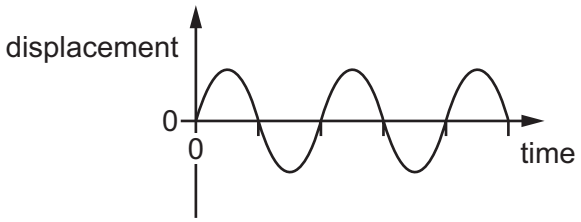


35 Microwaves and X-rays have different wavelengths. One of these waves is strongly ionising.

Which row shows the waves with the smaller wavelength and the waves that are strongly ionising?

	smaller wavelength	strongly ionising
A	microwaves	microwaves
B	microwaves	X-rays
C	X-rays	microwaves
D	X-rays	X-rays

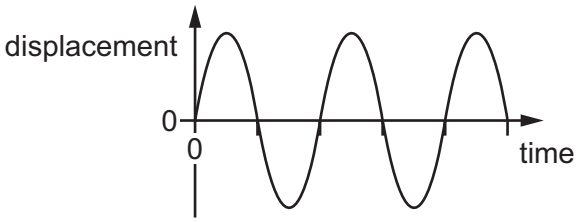
36 The diagram is a displacement-time graph for the molecules in air as a sound wave passes.



The graphs below are drawn to the same scale.

Which graph represents a quieter sound with a higher pitch?

A



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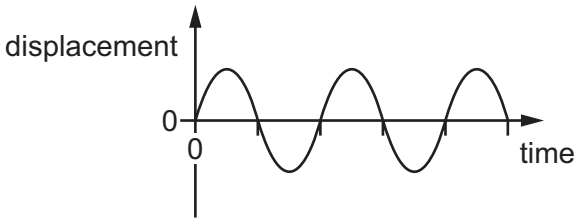
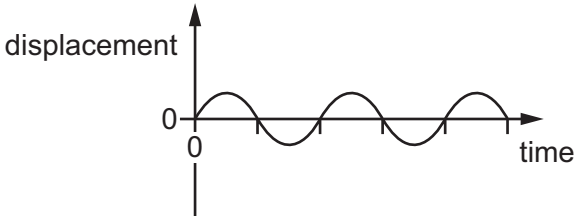


C



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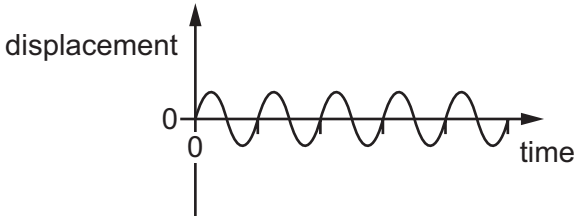


37 An electromagnet has a metal core.

Which metal is used and why?

A iron because it becomes a permanent magnet

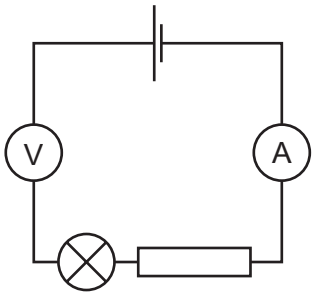
B iron because it does not become a permanent magnet

C steel because it becomes a permanent magnet

D steel because it does not become a permanent magnet

38 Which diagram shows a circuit that can be used to determine the resistance of the resistor shown?

A



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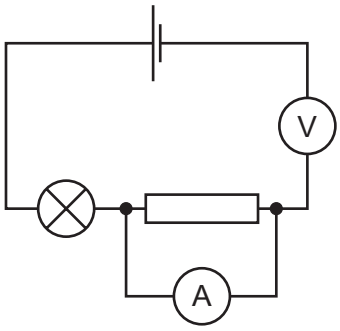

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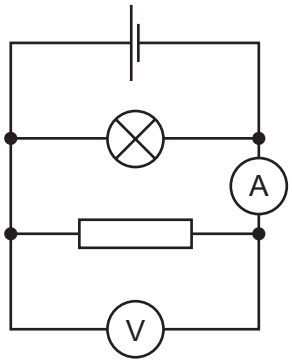

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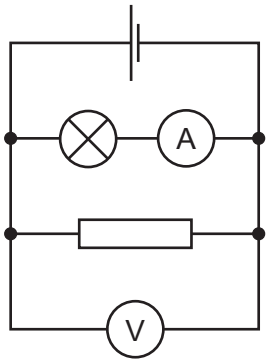


39 A circuit contains a lamp and a fuse.

There is a current of 2.0 A in the lamp and it operates normally.

A fault develops in the lamp. The current in the circuit increases, and the fuse now blows.

The diagrams show two circuits.

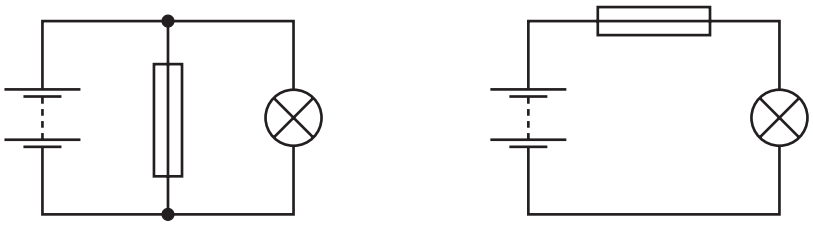


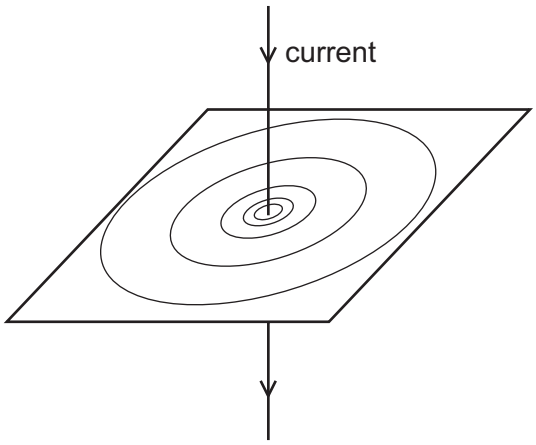
diagram 1 diagram 2

Which is the circuit used and what is the effect of the fuse when it blows?

	circuit	effect of fuse
A	diagram 1	reduces current to 0
B	diagram 1	reduces current to 2.0 A
C	diagram 2	reduces current to 0
D	diagram 2	reduces current to 2.0 A

40 Which diagram shows the pattern of the magnetic field around a straight wire carrying a current?

A



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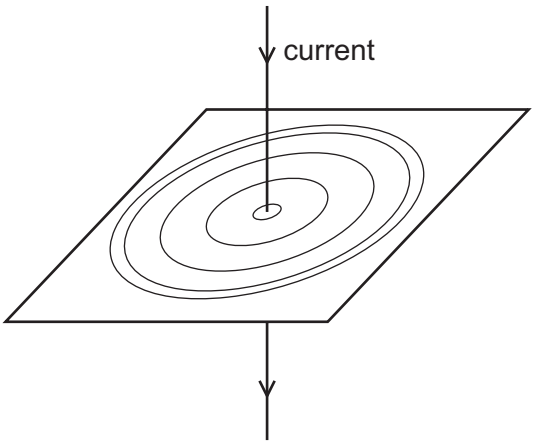

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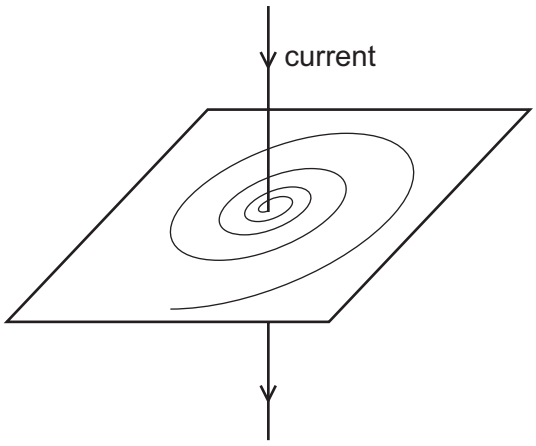
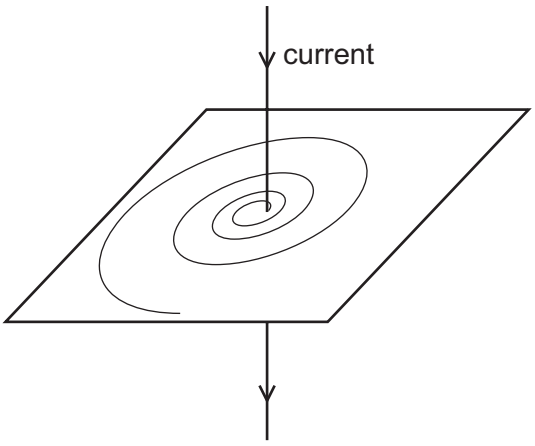


D



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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.).