EDEXCEL GCSE SCIENCE (360SCIENCE)

SCIENCE



EXAM QUESTION PACK

UNIT C1a MULTIPLE CHOICE 5007 PAPERS

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Signature	

Paper Reference(s)

5007 5035

Edexcel GCSE

Science (5007)

Chemistry (5035)

C1a – Topics 5 and 6

Foundation and Higher Tier

Tuesday 15 November 2011 – Morning

Time: 20 minutes

Materials required for examination
Multiple Choice Answer Sheet
HB pencil, eraser and calculator

Items included with question papers
Nil

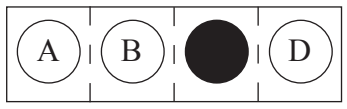
Instructions to Candidates

Use an HB pencil. Do not open this booklet until you are told to do so.
Mark your answers on the separate answer sheet.

Foundation tier candidates: answer questions 1 – 24.
Higher tier candidates: answer questions 17 – 40.
All candidates are to answer questions 17 – 24.

Before the test begins:
Check that the answer sheet is for the correct test and that it contains your candidate details.

How to answer the test:
For each question, choose the right answer, A, B, C or D and mark it in HB pencil on the answer sheet.
For example, the answer C would be marked as shown.



Mark only **one** answer for each question. If you change your mind about an answer, rub out the first mark **thoroughly**, then mark your new answer.

Do any necessary calculations and rough work in this booklet. You may use a calculator if you wish.

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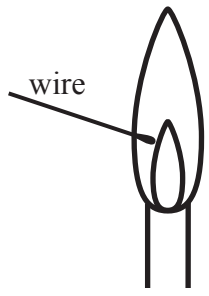
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Questions 1 to 16 must be answered by Foundation tier candidates only.
Higher tier candidates start at question 17.

Sodium chloride

1. A chemist was carrying out an experiment on solid sodium chloride.
He heated a wire, dipped the wire into concentrated hydrochloric acid and then into the solid.
He then put the wire back into the Bunsen flame.



The chemist was carrying out a

A flame test
B firework test
C dehydration reaction
D neutralisation reaction

2. When sodium chloride is placed in a Bunsen flame it produces

A white sparks
B a small explosion
C a yellow flame
D an orange gas

3. Sodium chloride is a

A mixture
B metallic element
C non-metallic element
D salt

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4. Sodium chloride can be made by reacting dilute hydrochloric acid with sodium hydroxide solution.
The reaction taking place is

A hydration
B neutralisation
C precipitation
D dehydration

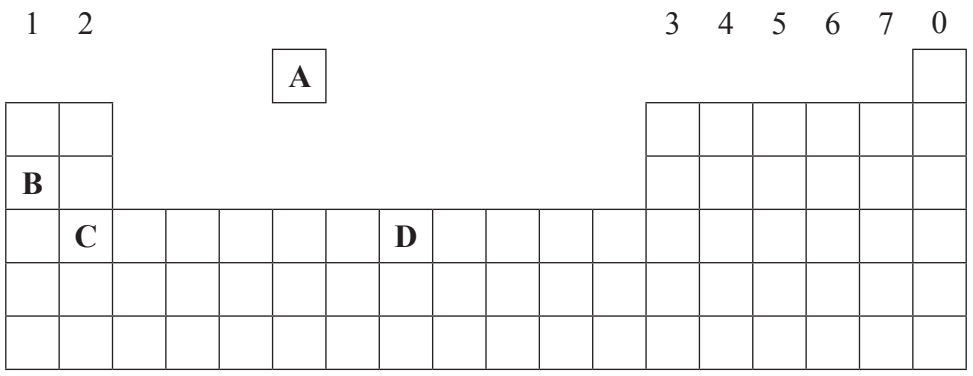
5. Sodium chloride solution is mixed with silver nitrate solution.
Solid silver chloride is formed as a precipitate.
This change happens because silver chloride

A has a high melting point
B is unreactive
C is an insoluble salt
D is pale blue

6. The symbol for an atom of sodium is

A S
B So
C N
D Na

7. Sodium is an alkali metal.
Which letter shows the position of sodium in the periodic table?



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Noble gases

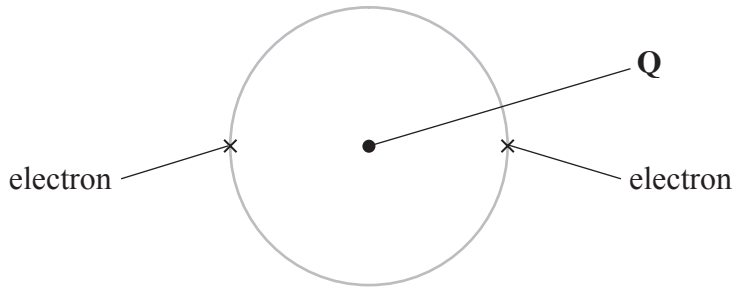
8. Helium is a noble gas.
Helium is less dense than air.



Helium is used to fill balloons because it makes the balloons

A rise in the air
B attractive in appearance
C flammable
D unlikely to burst

9. The diagram shows a helium atom.



The part of the atom labelled **Q** contains

A protons only
B neutrons only
C protons and neutrons only
D protons, neutrons and electrons

10. Helium and argon are two noble gases.
In the periodic table, helium and argon will be in

A the same period and the same group
B a different period but the same group
C the same period but a different group
D a different period and a different group

11. The noble gases

A become less reactive as their atomic number increases
B are unreactive compared to other elements
C all form stable compounds
D react with metals to form unstable compounds

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Metals and their compounds

12. Metals can be extracted from rocks found in the Earth's crust.
These rocks are all

A metal oxides
B elements
C pure compounds
D ores

13. Copper can be obtained from copper oxide by heating a mixture of copper oxide and carbon.
The word equation for the reaction is

copper oxide + carbon → copper + carbon dioxide

In this reaction the copper oxide is

A oxidised
B thermally decomposed
C reduced
D neutralised

14. John added dilute sulphuric acid to solid magnesium carbonate.
Bubbles of a gas were formed.
The gas was

A carbon dioxide
B hydrogen
C oxygen
D sulphur dioxide

15. Acids are sometimes classified as irritants.
To show this, which hazard symbol should be used on bottles of dilute sulphuric acid?



A



B



C



D

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16. Dilute sulphuric acid can be obtained by adding the concentrated acid to water.
During this process, heat is given out.
This proves that the process is

A exothermic
B hydration
C endothermic
D neutralisation

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Higher tier candidates start at question 17 and answer questions 17 to 40.
Questions 17 to 24 must be answered by all candidates: Foundation tier and Higher tier.

Baking cakes

Cakes are usually baked in a hot oven.

17. Which row of the table shows the type of reaction that takes place when a cake is baked and whether new products are formed or not?

	type of reaction	new products are formed
A	physical	yes
B	chemical	yes
C	physical	no
D	chemical	no

18. Cake mixtures sometimes contain sodium hydrogencarbonate.
When sodium hydrogencarbonate is heated strongly it forms new products.
The reaction that takes place is

A dehydration
B thermal decomposition
C combustion
D hydration

19. Baking powder can be a mixture of sodium hydrogencarbonate and tartaric acid.
During baking, these substances react to produce carbon dioxide.
In this reaction the acid is

A thermally decomposed
B neutralised
C combusted
D dehydrated

20. The test to prove that a gas is carbon dioxide is that the gas

A puts out a burning splint
B turns universal indicator solution red
C turns limewater milky
D when mixed with air and ignited, burns with a ‘pop’

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Elements

21. Which of these describes the colour and state at room temperature of a halogen?

A purple solid
B red-brown liquid
C yellow liquid
D dark green gas

22. The test for chlorine is that chlorine gas

A turns moist red litmus paper blue
B displaces fluorine from potassium fluoride solution
C burns with a green flame
D turns moist blue litmus paper red then white

23. The table shows the relative reactivity of some metals with water.

metal	relative reactivity with water
caesium	explosive
lithium	slow
potassium	vigorous

Which of these shows the metals in order of increasing atomic number?

	lowest atomic number →		highest atomic number
A	caesium	lithium	potassium
B	lithium	potassium	caesium
C	lithium	caesium	potassium
D	caesium	potassium	lithium

24. Some wire was reacted with dilute nitric acid.
A solution was formed.
Sodium hydroxide solution was mixed with this solution.
A pale blue precipitate was formed.
This showed that the wire contained

A iron
B zinc
C magnesium
D copper

TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS

Foundation tier candidates do not answer any more questions after question 24.

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Questions 25 to 40 must be answered by Higher tier candidates only.
Foundation tier candidates do not answer questions 25 to 40.

Atoms

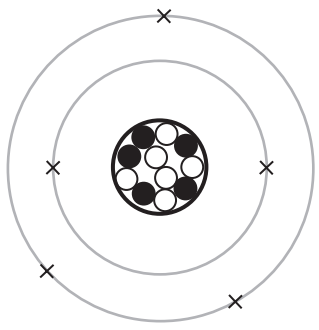
Most atoms contain electrons, protons and neutrons.

25. Which row of the table shows the relative charges on a proton, a neutron and an electron?

	charge on		
	proton	**neutron**	**electron**
A	no charge	positive	negative
B	negative	no charge	positive
C	positive	negative	no charge
D	positive	no charge	negative

Use this information to answer questions 26 and 27.

The diagram shows the structure of an atom of boron.



26. How many particles are in the nucleus of this atom?

A 3
B 6
C 11
D 16

27. How many protons are in this atom?

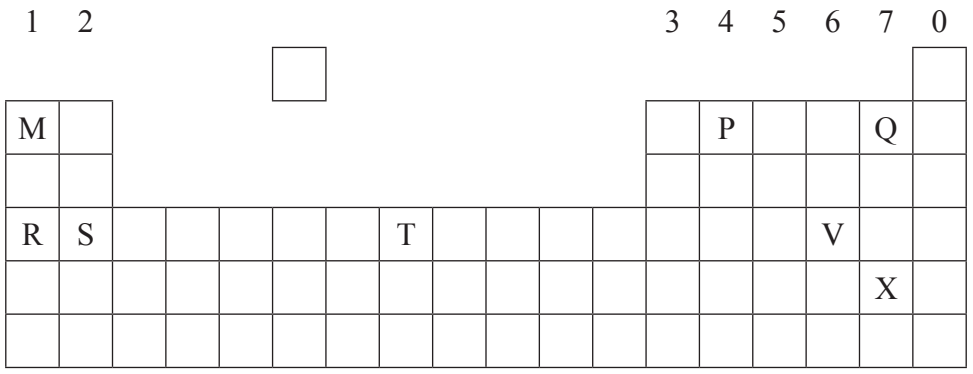
A 5
B 6
C 11
D 16

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The periodic table

Use this periodic table to answer questions 28 to 31.

The positions of some elements in the periodic table are shown.



The letters shown are **not** the symbols of atoms of the elements.

28. Which letter shows the position of a non-metallic element in period 4?

A P
B T
C V
D X

29. Which letter shows the position of an element that forms salts which produce a lilac flame in a flame test?

A M
B R
C S
D T

30. Which letter shows the position of an element that forms salts which, when dissolved in water, produce a red-brown precipitate with sodium hydroxide solution?

A R
B S
C T
D V

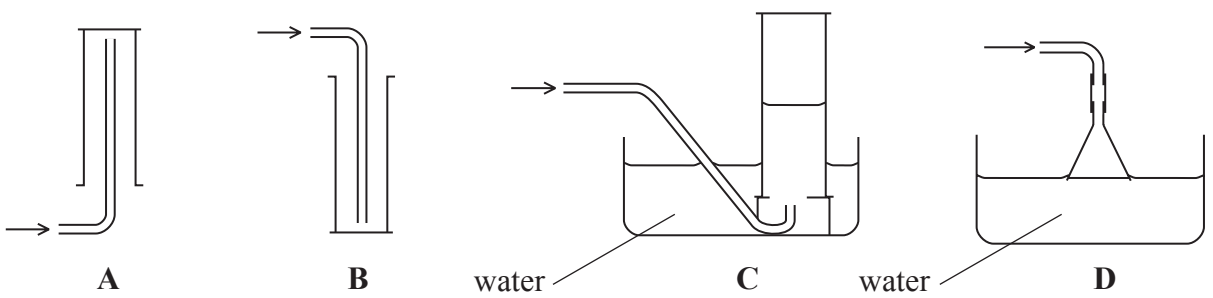
31. Which letter shows the position of a halogen that is more reactive than bromine?

A P
B Q
C R
D X

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Elements and compounds

32. A gas is denser than air.
It is soluble in water.
Which apparatus should be used to collect a sample of this gas?



A **B** **C** **D**

33. Copper chloride can be prepared by reacting copper oxide, CuO, with dilute hydrochloric acid.
The equation for this reaction is

A $2CuO + 2HCl \rightarrow 2CuCl + H_2 + O_2$
B $4CuO + 2H_2Cl \rightarrow 2Cu_2Cl + 2H_2O + O_2$
C $CuO + 2HCl \rightarrow CuCl_2 + H_2O$
D $CuO + H_2Cl \rightarrow CuCl + H_2O$

34. Which of these mixtures will **not** produce a displacement reaction?

A chlorine and sodium bromide solution
B chlorine and sodium iodide solution
C bromine and sodium iodide solution
D iodine and sodium bromide solution

35. Potassium chlorate is a compound containing the elements

A potassium, chlorine and carbon
B potassium, chlorine and hydrogen
C potassium, chlorine and oxygen
D potassium and chlorine only

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Acids

36. The table suggests two ways in which phosphoric acid might be used.
Which row of the table is correct?

	to make fertiliser	**in some soft drinks**
A	yes	no
B	no	yes
C	yes	yes
D	no	no

37. If concentrated sulphuric acid is added to glucose, $C_6H_{12}O_6$, solid black carbon is formed.
In this reaction the glucose is

A hydrated
B dehydrated
C neutralised
D reduced

38. Which row of the table shows the reagents that react with dilute hydrochloric acid to form zinc chloride?

	zinc	**zinc oxide**	**zinc carbonate**
A	yes	yes	yes
B	yes	yes	no
C	yes	no	yes
D	no	yes	yes

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Use this information to answer questions 39 and 40.

Lead sulphate is an insoluble salt.
It can be prepared by reacting a solution of lead nitrate with dilute sulphuric acid.

39. Which of these statements about this preparation of lead sulphate are correct?

1 the reaction taking place involves the reduction of lead nitrate
2 pure, dry lead sulphate is obtained from the resulting mixture by evaporation

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

40. The equation for this reaction is

A $PbNO_3 + HSO_4 \rightarrow PbSO_4 + HNO_3$
B $PbNO_3 + H_2SO_4 \rightarrow PbSO_4 + H_2NO_3$
C $Pb(NO_3)_2 + H_2SO_4 \rightarrow PbSO_4 + 2HNO_3$
D $Pb_2NO_3 + 2HSO_4 \rightarrow 2PbSO_4 + H_2NO_3$

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

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Mark Scheme (Results)

November 2011

360Science

GCSE Science
Multiple Choice Paper C1a (5007)

GCSE Chemistry
Multiple Choice Paper C1a (5035)

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5007 & 5035 (C1a) Mark Scheme
November 2011

Unit C1a – 5007/5035	
Topics 1 & 2	
1	A
2	C
3	D
4	B
5	C
6	D
7	B
8	A
9	C
10	B
11	B
12	D
13	C
14	A
15	D
16	A

Unit C1a – 5007/5035	
Topics 1 & 2	
17	B
18	B
19	B
20	C
21	B
22	D
23	B
24	D

Unit C1a – 5007/5035	
Topics 1 & 2	
25	D
26	C
27	A
28	C
29	B
30	C
31	B
32	B
33	C
34	D
35	C
36	C
37	B
38	A
39	D
40	C

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Edexcel GCSE

Science (5007)

Chemistry (5035)

C1a – Topics 5 and 6

Foundation and Higher Tier

Friday 17 June 2011 – Afternoon

Time: 20 minutes

Materials required for examination
Multiple Choice Answer Sheet
HB pencil, eraser and calculator

Items included with question papers
Nil

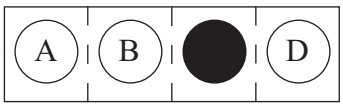
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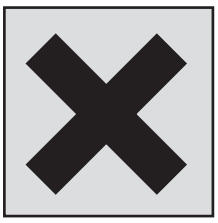
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Questions 1 to 16 must be answered by Foundation tier candidates only.
Higher tier candidates start at question 17.

Hydrogen

1. Which of these hazard symbols is used to show that hydrogen is flammable?



A



B



C

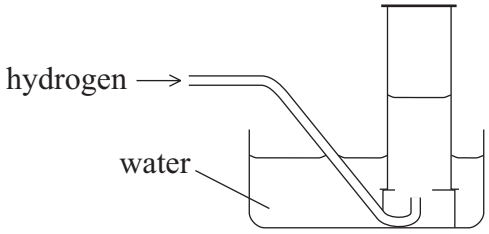


D

2. When potassium reacts with water, hydrogen is produced.
During the reaction heat is given out.
The reaction is

A a thermal decomposition
B endothermic
C exothermic
D a neutralisation

3. Hydrogen is often collected using this apparatus.



This method is known as collecting the gas

A under water
B over water
C by downward delivery
D by upward delivery

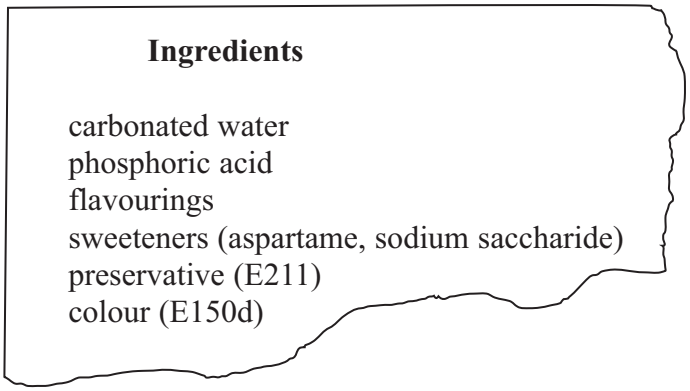
4. A mixture of hydrogen and air explodes if it is ignited.
This explosion is the result of

A a slow physical change
B a fast physical change
C a slow chemical reaction
D a fast chemical reaction

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Cola

This is part of the label from a bottle containing cola.



Ingredients

carbonated water
phosphoric acid
flavourings
sweeteners (aspartame, sodium saccharide)
preservative (E211)
colour (E150d)

5. E211 has the formula $NaC_6H_5CO_2$.
E211 contains atoms of the element

A carbohydrate
B nitrogen
C hydrogen
D cobalt

6. The cola contains artificial sweeteners.
Artificial means

A less sweet than sugar
B obtained from plants
C man-made
D dissolves easily

7. A chemist tests a sample of the sweetener, sodium saccharide, to prove that it is a sodium salt.
To do this the chemist should use

A a flame test
B nitric acid
C universal indicator solution
D sodium hydroxide solution

8. Warming the cola causes a gas to be released.
This gas turns limewater milky.
The gas is

A oxygen
B carbon dioxide
C nitrogen
D steam

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9. The cola contains phosphoric acid.
Another use for phosphoric acid is

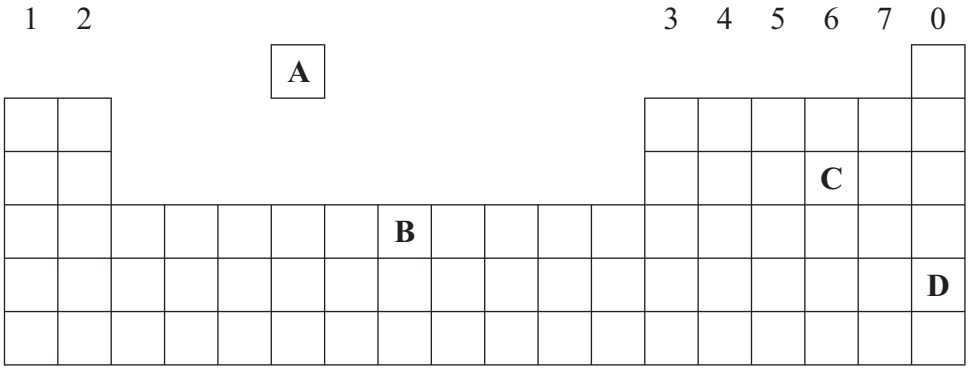
A to make fertilisers
B in vinegar
C as table salt
D to make nitric acid

Metals

10. Most metals are found in the Earth's crust as

A liquids
B alloys
C ores
D uncombined elements

11. Which letter shows the position of a metal in the periodic table?



12. The symbol for an atom of copper is

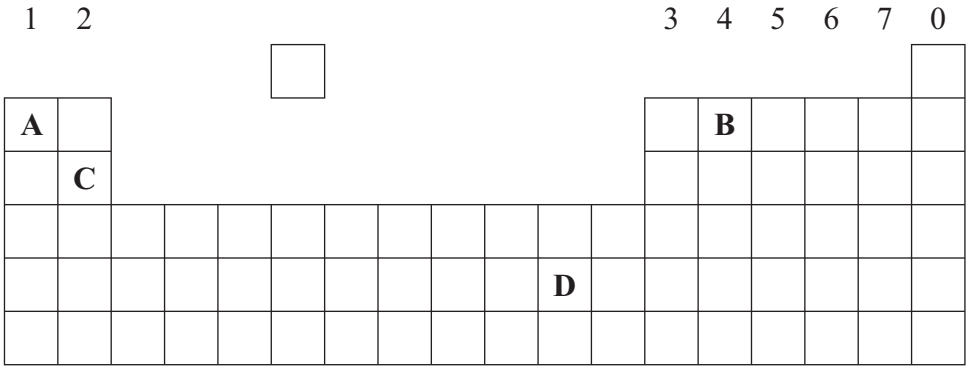
A C
B Co
C Cu
D Cp

13. Monica added a reagent to copper nitrate solution.
This produced a blue precipitate.
The reagent was

A sodium chloride solution
B sodium hydroxide solution
C water
D dilute sulphuric acid

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14. Lithium is an alkali metal.
Which letter shows the position of lithium in the periodic table?



15. Gold is found as the uncombined metal in the Earth's crust.
Gold is found as the uncombined metal because gold metal is

A unstable
B hard
C heavy
D unreactive

16. Rubidium and caesium are in the same group of the periodic table.
Rubidium and caesium have

A very different physical properties and very different chemical reactions
B the same physical properties but very different chemical reactions
C different physical properties and similar chemical reactions
D the same physical properties and similar chemical reactions

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Higher tier candidates start at question 17 and answer questions 17 to 40.
Questions 17 to 24 must be answered by all candidates: Foundation tier and Higher tier.

Carbonates and hydrogencarbonates

17. Baking powder contains

A sodium carbonate only
B sodium hydrogencarbonate only
C sodium carbonate and an acidic substance
D sodium hydrogencarbonate and an acidic substance

18. When anhydrous magnesium carbonate is heated, a gas is produced.
This reaction is an example of

A neutralisation
B thermal decomposition
C oxidation
D dehydration

19. When potassium hydrogencarbonate is heated, a gas is produced.
The gas is

A oxygen
B hydrogen
C carbon monoxide
D carbon dioxide

20. Barium carbonate is an insoluble salt.
Barium carbonate is best prepared by

A mixing solutions of barium nitrate and potassium carbonate
B heating a mixture of barium and potassium carbonate
C adding barium oxide to potassium carbonate solution
D evaporating a mixture of barium hydroxide and carbonic acid

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The halogens

The table gives information about four halogens.

name	atomic number
fluorine	9
chlorine	17
bromine	35
iodine	53

21. The least reactive halogen shown in the table is

A fluorine
B chlorine
C bromine
D iodine

22. Every bromine atom must

A contain 35 neutrons
B contain 35 protons
C contain the same number of electrons as a fluorine atom
D have a negative charge

23. The nucleus of an atom of iodine contains

A protons only
B electrons only
C protons and neutrons
D protons and electrons

24. If chlorine is bubbled into potassium bromide solution, bromine is formed.
The reaction taking place is known as

A displacement
B dehydration
C neutralisation
D thermal decomposition

TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS

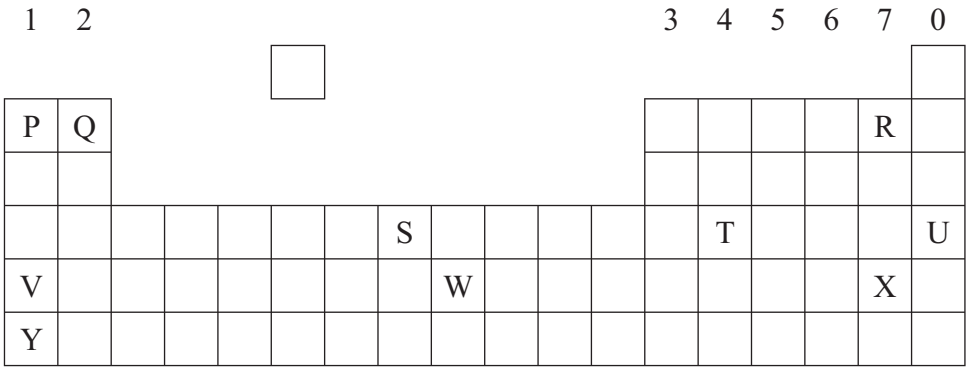
Foundation tier candidates do not answer any more questions after question 24.

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Questions 25 to 40 must be answered by Higher tier candidates only.
Foundation tier candidates do not answer questions 25 to 40.

Periodic table

The positions of some elements in the periodic table are shown.



The letters shown are not the symbols of atoms of the elements.

25. Which letter shows the position of an element that is a gas at room temperature and is unreactive?

A Q
B S
C U
D X

26. Which letter shows the position of a halogen that is more reactive than bromine?

A R
B T
C X
D Y

27. Which letter shows the position of a transition metal in period 4?

A S
B T
C V
D W

28. Which letter shows the position of an alkali metal that is less reactive than potassium?

A P
B Q
C S
D Y

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Salts

29. Which row of the table shows reagents that could be added to dilute hydrochloric acid to make magnesium chloride solution?

	magnesium oxide	magnesium hydroxide	magnesium carbonate
A	yes	yes	yes
B	yes	yes	no
C	no	yes	yes
D	yes	no	no

30. Calcium oxide reacts with water to form calcium hydroxide.
The equation for the reaction is

$$CaO + H_2O \rightarrow Ca(OH)_2$$

In this reaction the calcium oxide is

A reduced
B oxidised
C dehydrated
D hydrated

31. Barium chloride solution, $BaCl_2$, was mixed with dilute sulphuric acid.
A white precipitate of barium sulphate was formed.
The equation for the reaction is

A $BaCl_2 + 2HSO_4 \rightarrow Ba(SO_4)_2 + 2HCl$
B $BaCl_2 + H(SO_4)_2 \rightarrow Ba(SO_4)_2 + HCl_2$
C $2BaCl_2 + H_2SO_4 \rightarrow Ba_2SO_4 + 2HCl_2$
D $BaCl_2 + H_2SO_4 \rightarrow BaSO_4 + 2HCl$

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32. Jane carried out flame tests on four salts, W, X, Y and Z.
Her results are shown in the table.

salt	flame colour
W	yellow
X	blue-green
Y	lilac
Z	green

Which of these are salts of metals in group 1 of the periodic table?

A W only
B Y and Z
C W and Y
D X and Y

33. Sodium nitrate is soluble in water.
A pure sample of solid sodium nitrate is prepared in the laboratory.
Which of these methods could safely be used?

A mix solutions of sodium chloride and potassium nitrate and filter the mixture
B react excess sodium with dilute nitric acid and filter the mixture
C mix solutions of sodium chloride and potassium nitrate and obtain crystals from the solution
D neutralise sodium hydroxide solution with dilute nitric acid and obtain crystals from the solution

34. The formula of a salt is $NaClO_3$.
The name of this salt is

A sodium chlorioxide
B sodium oxichloride
C sodium chlorate
D sodium chloride

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Useful substances

35. When copper oxide is heated with substance X, copper is formed.
Which row of the table shows substance X and what is happening to copper oxide during the reaction?

	substance X	**copper oxide is**
A	carbon dioxide	reduced
B	carbon	reduced
C	carbon dioxide	thermally decomposed
D	carbon	thermally decomposed

36. In industry, phosphoric acid is used to make some useful substances.
Which row of the table is correct?

	phosphoric acid is used to make	
	synthetic detergents	**fertilisers**
A	no	no
B	no	yes
C	yes	no
D	yes	yes

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Elements and compounds

37. Max added sodium hydroxide solution to a solution of a salt.
He obtained a pale green precipitate.
The formula of the substance precipitated could be

A $Cu(OH)_2$
B $Fe(OH)_2$
C $Zn(OH)_2$
D $Fe(OH)_3$

38. The table shows the boiling points of four halogens, W, X, Y and Z.

halogen	boiling point (°C)
W	59
X	–188
Y	184
Z	–34

Which of these shows the four halogens in order of increasing atomic number?

A Z, W, Y, X
B X, Z, W, Y
C Y, W, Z, X
D Z, X, W, Y

39. Chlorine reacts with potassium iodide solution.
The equation for this reaction is

A $Cl + KI \rightarrow KCl + I$
B $Cl_2 + KI_2 \rightarrow KCl_2 + I_2$
C $2Cl + 2KI \rightarrow 2KCl + I_2$
D $Cl_2 + 2KI \rightarrow 2KCl + I_2$

40. Which of these statements about chlorine are correct?

1 chlorine turns moist red litmus paper blue and then bleaches it
2 chlorine is collected in the laboratory by downward delivery because it is soluble in water and less dense than air

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

END

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Mark Scheme (Results)

June 2011

360Science

GCSE Science
Multiple Choice Paper C1a (5007)

GCSE Chemistry
Multiple Choice Paper C1a (5035)

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5007 & 5035 (C1a) Mark Scheme
June 2011

Unit C1a – 5007/5035	
Topics 5 & 6	
1	D
2	C
3	B
4	D
5	C
6	C
7	A
8	B
9	A
10	C
11	B
12	C
13	B
14	A
15	D
16	C

Unit C1a – 5007/5035	
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Unit C1a – 5007/5035	
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29	A
30	D
31	D
32	C
33	D
34	C
35	B
36	D
37	B
38	B
39	D
40	D

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Edexcel GCSE

Science (5007)

Chemistry (5035)

C1a – Topics 5 and 6

Foundation and Higher Tier

Friday 4 March 2011 – Morning

Time: 20 minutes

Materials required for examination
Multiple Choice Answer Sheet
HB pencil, eraser and calculator

Items included with question papers
Nil

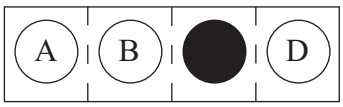
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Higher tier candidates: answer questions 17 – 40.
All candidates are to answer questions 17 – 24.

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How to answer the test:
For each question, choose the right answer, A, B, C or D and mark it in HB pencil on the answer sheet.
For example, the answer C would be marked as shown.



Mark only **one** answer for each question. If you change your mind about an answer, rub out the first mark **thoroughly**, then mark your new answer.

Do any necessary calculations and rough work in this booklet. You may use a calculator if you wish.

You must not take this booklet or the answer sheet out of the examination room.

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Questions 1 to 16 must be answered by Foundation tier candidates only.
Higher tier candidates start at question 17.

Neon

Neon is an element.
It does not combine with any other elements to form compounds.

1. Neon is

A a noble gas
B a halogen
C an alkali metal
D a transition metal

2. The symbol for an atom of neon is

A N
B ne
C Ne
D NE

3. Helium is an element which is in the same group of the periodic table as neon.
Helium

A reacts with oxygen
B forms compounds
C does not combine with any other elements
D reacts vigorously with water

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Chlorine

4. Chlorine is a toxic gas.
Which of these hazard symbols on a cylinder of chlorine shows that chlorine is toxic?



A



B



C



D

5. What is used to test for chlorine?

A a glowing splint
B a lighted splint
C damp blue litmus paper
D limewater

6. What is the colour of chlorine gas?

A purple
B yellow-green
C grey
D red-brown

Metals from the Earth

7. Magnesium is a reactive metal.
It is usually found in the Earth's crust as

A an ore
B a liquid
C the pure metal
D an alloy

8. Magnesium reacts with oxygen to form magnesium oxide.
In this reaction the magnesium is

A neutralised
B oxidised
C reduced
D thermally decomposed

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9. Iron occurs naturally as its oxide.
Which substance can be used to obtain iron from its oxide?

A carbon
B sodium hydroxide
C copper
D water

Sodium chloride

10. The formula of sodium chloride is

A Na_2Cl
B $NaCl_2$
C NaCl
D Na_2Cl_2

11. Sodium chloride can be formed by the reaction

sodium hydroxide + hydrochloric acid $\rightarrow$ sodium chloride + water

This reaction is an example of

A hydration
B neutralisation
C oxidation
D thermal decomposition

12. Sodium chloride is used

A as a fertiliser
B to clean drains
C in fire extinguishers
D to flavour food

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Cakes

These ingredients are used to make some cakes

butter
sugar
eggs
vanilla extract
flour
baking powder
milk
salt

13. Artificial vanilla flavouring is often used instead of vanilla extract.
Artificial means

A man-made
B pure
C obtained from plants
D has no taste

14. Baking powder is a mixture of

A sodium carbonate and an acidic substance
B sodium carbonate and an alkaline substance
C sodium hydrogencarbonate and an acidic substance
D sodium hydrogencarbonate and an alkaline substance

15. The purpose of the baking powder is to allow the cakes to

A taste sweet
B stay fresh for longer
C rise
D become more dense

16. All cooking processes involve a

A chemical change
B physical change
C neutralisation reaction
D thermal decomposition reaction

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Higher tier candidates start at question 17 and answer questions 17 to 40.
Questions 17 to 24 must be answered by all candidates: Foundation tier and Higher tier.

Practical chemistry

17. Copper oxide is a black powder.
Copper sulphate is a blue, crystalline solid which is soluble in water.
When copper oxide is reacted with dilute sulphuric acid, copper sulphate solution is formed.
What would you see during this reaction?

A bubbles of gas
B the liquid turning blue
C a blue precipitate
D a black solid forming

18. A few drops of sodium hydroxide solution were added to a solution of a salt.
A red-brown precipitate was seen.
This salt must be a salt of

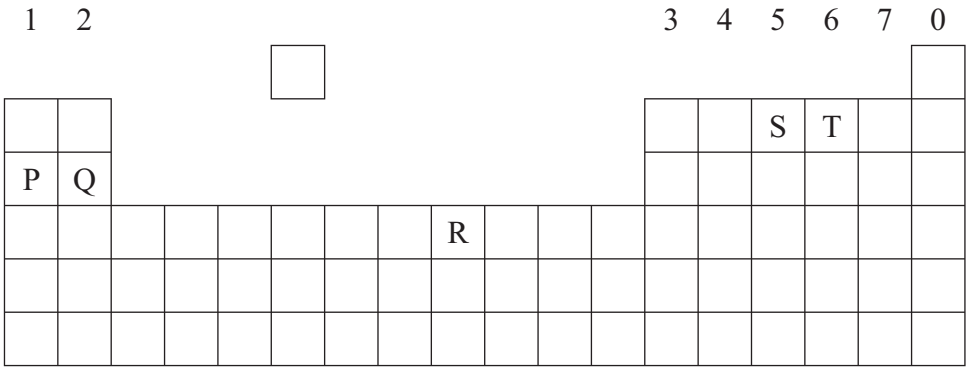
A iron
B copper
C zinc
D sodium

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Periodic table

Use the following information to answer questions 19 to 21.

The positions of five elements in the periodic table are shown by the letters P, Q, R, S and T.
The letters shown are not the symbols of atoms of the elements.



19. Elements in the periodic table are placed in order of increasing

A relative atomic mass
B atomic number
C year of discovery
D number of neutrons per atom

20. Elements can be metals or non-metals.
Which statement is correct?

A T is a metal and S is a non-metal
B S is a metal and T is a non-metal
C P is a metal and Q is a non-metal
D Q is a metal and S is a non-metal

21. Which letter shows the position of a transition metal?

A P
B Q
C R
D S

22. An atom of copper contains 29 electrons, 29 protons and 35 neutrons.
The atomic number of copper is

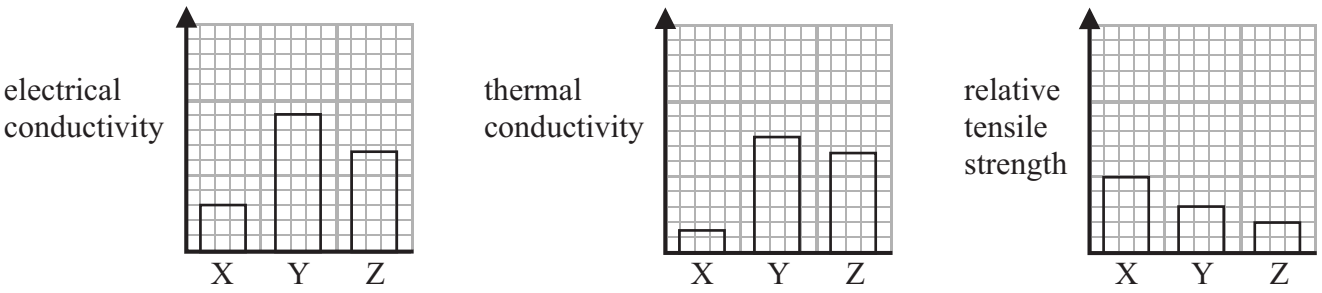
A 29
B 35
C 58
D 64

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23. Which row of the table shows the correct charges on a proton, an electron and a neutron?

	proton	**electron**	**neutron**
A	+1	0	–1
B	0	–1	+1
C	–1	+1	0
D	+1	–1	0

24. The charts show the relative tensile strength, thermal conductivity and electrical conductivity of three metals, X, Y and Z.



Which row of the table shows the best metal to use to make electrical wires and the best metal to use to make bridges.

	electrical wiring	**bridges**
A	Y	Z
B	Z	Y
C	Y	X
D	Z	X

TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS

Foundation tier candidates do not answer any more questions after question 24.

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Questions 25 to 40 must be answered by Higher tier candidates only.
Foundation tier candidates do not answer questions 25 to 40.

Reactions

25. The equation for the reaction occurring when sodium hydrogencarbonate is heated is

$$2NaHCO_3 \rightarrow Na_2CO_3 + H_2O + CO_2$$

This reaction is an example of

A hydration
B oxidation
C neutralisation
D thermal decomposition

Use the following information to answer questions 26 and 27.

Calcium oxide reacts with dilute hydrochloric acid to produce the soluble salt, calcium chloride.

26. The balanced equation for the reaction is

A $CaO_2 + 2HCl \rightarrow CaCl_2 + 2H_2O$
B $CaO + 2HCl \rightarrow CaCl_2 + H_2O$
C $Ca_2O + 2HCl \rightarrow 2CaCl + H_2O$
D $CaO + HCl \rightarrow CaCl + H_2O$

27. Which of the following statements about the reaction are correct?

1 there is a reduction reaction taking place
2 the reaction will produce a white precipitate

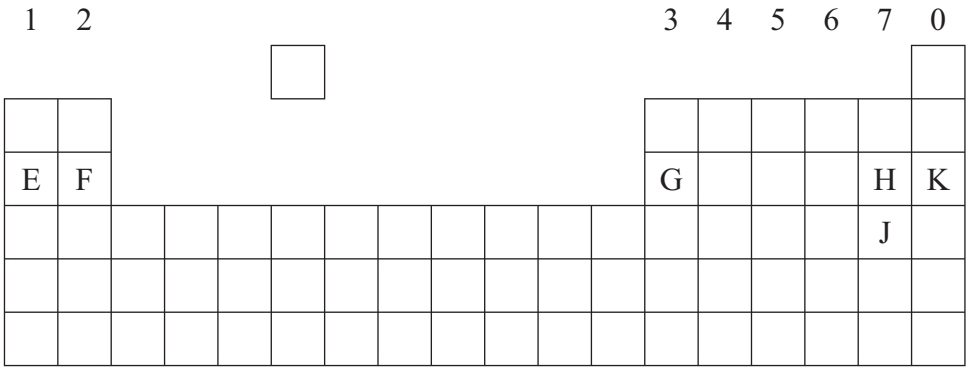
A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

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Trends and patterns

Use the following information to answer questions 28 and 29.

The positions of six elements in the periodic table are shown by the letters E, F, G, H, J and K.
The letters shown are not the symbols of atoms of the elements.



28. Which pair of letters show the position of two elements with the most similar properties?

A E and F
B F and G
C H and J
D H and K

29. Which letter shows the position of a halogen in period 3?

A G
B H
C J
D K

30. When the reagents are mixed together, which of the following results in a displacement reaction?

A bromine and potassium chloride solution
B bromine and potassium fluoride solution
C chlorine and potassium bromide solution
D chlorine and potassium fluoride solution

31. Which row of the table shows the correct colour and state of the named halogen at room temperature?

	halogen	**colour at room temperature**	**state at room temperature**
A	iodine	grey	solid
B	bromine	red-brown	solid
C	iodine	purple	solid
D	bromine	red-brown	gas

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32. The table shows the atomic numbers of the first five alkali metals.

name of metal	atomic number
lithium	3
sodium	11
potassium	19
rubidium	37
caesium	55

Which of these statements about the alkali metals are correct?

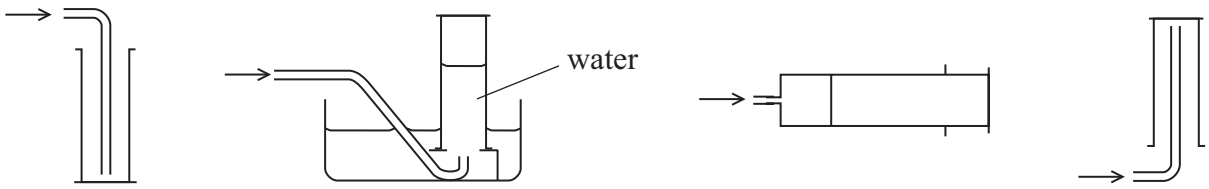
1 lithium is more reactive than sodium
2 the reaction of potassium with water is exothermic

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

33. When lithium reacts with water, it produces lithium hydroxide and hydrogen.
The balanced equation for this reaction is

A $Li + H_2O \rightarrow LiOH + H$
B $Li + 2H_2O \rightarrow Li(OH)_2 + H_2$
C $2Li + 2H_2O \rightarrow 2LiOH + H_2$
D $2Li + H_2O \rightarrow Li_2O + H_2$

34. Hydrogen is insoluble in water.
Hydrogen is less dense than air.
Which set of apparatus could **not** be used to collect hydrogen gas?



A **B** **C** **D**

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35. Which row of the table shows the correct test for hydrogen and the result of the test when a small amount of air is present?

	test	result of test
A	glowing splint	squeaky pop
B	glowing splint	splint relights
C	lighted splint	squeaky pop
D	lighted splint	splint relights

36. Which row of the table shows a hazard symbol with the correct name and description of the hazard?

	hazard symbol	name of hazard	description of hazard
A		flammable	provides oxygen for other substances to burn
B		oxidising	these substances catch fire easily
C		oxidising	provides oxygen for other substances to burn
D		flammable	these substances catch fire easily

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Metals and their salts

37. Copper sulphate is a soluble salt.
It can be made by reacting copper oxide with dilute sulphuric acid.
The products of the reaction are

A copper sulphate only
B copper sulphate and water
C copper sulphate and hydrogen only
D copper sulphate, hydrogen and oxygen

38. Barium sulphate is an insoluble salt.
It is prepared as a precipitate by mixing solutions of two soluble salts.
What is the order of steps to obtain pure, dry barium sulphate from this mixture?

	first step		**last step**
A	wash precipitate	filter off precipitate	dry in oven
B	dry in oven	wash precipitate	filter off precipitate
C	filter off precipitate	dry in oven	wash precipitate
D	filter off precipitate	wash precipitate	dry in oven

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39. Two tests that show the presence of copper in a compound are

a flame test on the solid

the addition of sodium hydroxide solution to a solution of the copper compound.

Which row of the table shows the results of these tests?

	the colour of the flame in the flame test	**colour of precipitate when sodium hydroxide solution is added**
A	pale green	pale blue
B	pale green	dark green
C	green-blue	dark green
D	green-blue	pale blue

40. Copper can be obtained from its oxide by heating the oxide with carbon.
The overall equation for the reaction is

$$2CuO + C \rightarrow 2Cu + CO_2$$

Which of the following statements about this reaction are correct?

1 copper oxide is reduced
2 carbon is oxidised

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

END

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GCSE Science
Multiple Choice Paper C1a (5007/01)

GCSE Chemistry
Multiple Choice Paper C1a (5035/01)

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5007 & 5035 (C1a) Mark Scheme

Unit C1a – 5007/5035	
Topics 5 & 6	
1	A
2	C
3	C
4	B
5	C
6	B
7	A
8	B
9	A
10	C
11	B
12	D
13	A
14	C
15	C
16	A

Unit C1a – 5007/5035	
Topics 5 & 6	
17	B
18	A
19	B
20	D
21	C
22	A
23	D
24	C

Unit C1a – 5007/5035	
Topics 5 & 6	
25	D
26	B
27	D
28	C
29	B
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33	C
34	A
35	C
36	C
37	B
38	D
39	D
40	C

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Edexcel GCSE

Science (5007)

Chemistry (5035)

C1a – Topics 5 and 6

Foundation and Higher Tier

Friday 12 November 2010 – Afternoon

Time: 20 minutes

Materials required for examination	**Items included with question papers**
Multiple Choice Answer Sheet HB pencil, eraser and calculator	Nil

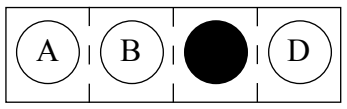
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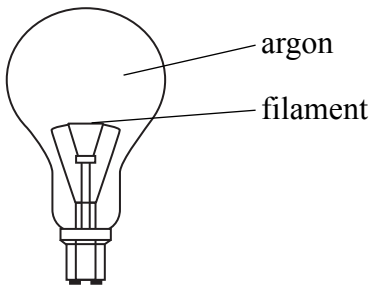
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Questions 1 to 16 must be answered by Foundation tier candidates only.
Higher tier candidates start at question 17.

Noble gases

1. Argon is a noble gas.
Electric light bulbs are filled with argon to prevent the hot filament from burning.



Argon is used because it is

A unreactive
B a coloured gas
C denser than air
D flammable

2. The symbol for an atom of argon is

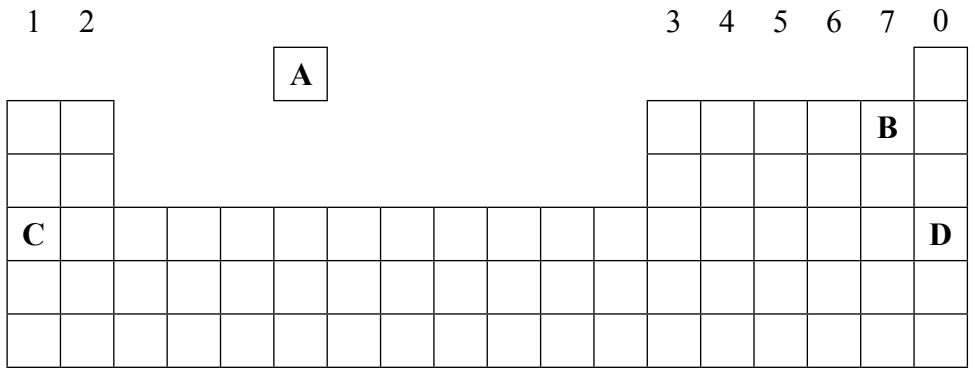
A aR
B Ar
C AR
D ar

3. Helium and neon are noble gases. They have similar chemical properties.
Helium and neon

A form compounds
B react with oxygen
C are in the same group in the periodic table
D react with each other

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4. Which letter shows the position of a noble gas in the periodic table?

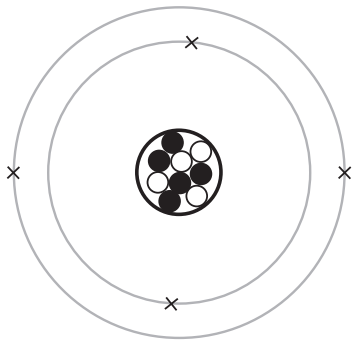


5. An atom of helium contains two protons, two neutrons and two electrons.
The atomic number of helium is

A 2
B 3
C 4
D 6

Metals

6. Beryllium is a metal.
The diagram shows the positions of electrons, neutrons and protons in an atom of beryllium.



In the diagram, × shows the position of

A an electron
B a neutron
C a nucleus
D a proton

7. The part of an atom which contains protons and neutrons is the

A core
B nucleus
C shell
D molecule

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8. Magnesium is a metal.
Heat is given out when magnesium reacts with dilute hydrochloric acid.
This means the reaction is

A a thermal decomposition
B endothermic
C explosive
D exothermic

9. When magnesium reacts with dilute hydrochloric acid, hydrogen is produced.
A test for hydrogen is that it

A relights a glowing splint
B turns universal indicator red
C turns universal indicator blue
D pops when mixed with air and lit

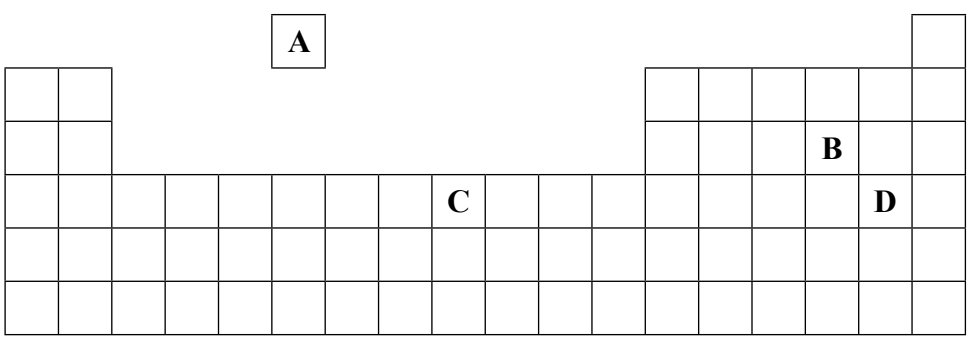
10. Gold is used to make rings and other jewellery because it

A has a low cost
B is light in weight
C remains shiny for many years
D does not conduct electricity

11. A piece of iron which has been buried in the ground is found covered in a red-brown deposit of rust.
To form the rust, the iron has undergone a

A slow, chemical change
B fast, chemical change
C slow, physical change
D fast, physical change

12. Which letter shows the position of a metal in the periodic table?



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Common salt

Common salt is sodium chloride.

13. Common salt can be extracted from the Earth.
This common salt is

A artificial
B natural
C man-made
D an element

14. Dilute hydrochloric acid reacts with sodium hydroxide solution to form sodium chloride and water.
This reaction is an example of

A hydration
B oxidation
C neutralisation
D precipitation

15. Salt is often added to crisps.
The salt

A makes the crisps more healthy to eat
B adds flavour to the crisps
C adds colour to the crisps
D makes the crisps softer

16. A flame test can be used to identify sodium compounds.
The colour produced in the flame is

A blue
B yellow
C green
D red

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Higher tier candidates start at question 17 and answer questions 17 to 40.
Questions 17 to 24 must be answered by all candidates: Foundation tier and Higher tier.

Everyday metals

17. Iron is an important metal.
Most iron is found in the Earth's crust as

A the metal
B alloys
C steel
D ores

18. When copper is heated in air it reacts to form copper oxide.

copper + oxygen → copper oxide

In this reaction copper is

A reduced
B hydrated
C oxidised
D thermally decomposed

19. Zinc oxide can be converted to zinc by heating the zinc oxide with

A copper
B oxygen
C carbon dioxide
D carbon

20. Lead oxide can be converted to lead by heating it in hydrogen.

lead oxide + hydrogen → lead + water

In this reaction the lead oxide is

A dehydrated
B hydrated
C reduced
D oxidised

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Baking powder

21. The main ingredient in baking powder is a sodium compound.
This sodium compound is

A sodium hydroxide
B sodium carbonate
C sodium oxide
D sodium hydrogencarbonate

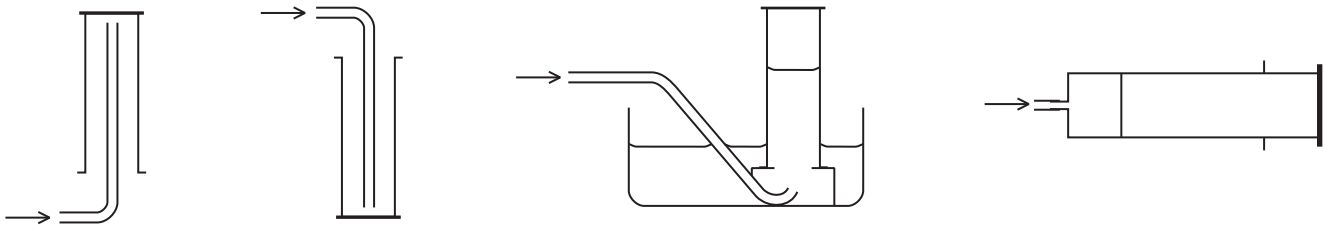
22. When baking powder is used, the sodium compound reacts with an acidic substance to produce carbon dioxide.
In this reaction the acidic substance is

A thermally decomposed
B neutralised
C hydrated
D dehydrated

23. The test to prove that a gas is carbon dioxide is that it

A puts out a glowing splint
B relights a glowing splint
C turns moist blue litmus paper red
D turns limewater milky

24. Carbon dioxide is denser than air and slightly soluble in water.
Which apparatus could **not** be used to collect carbon dioxide free from air?



A **B** **C** **D**

TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS

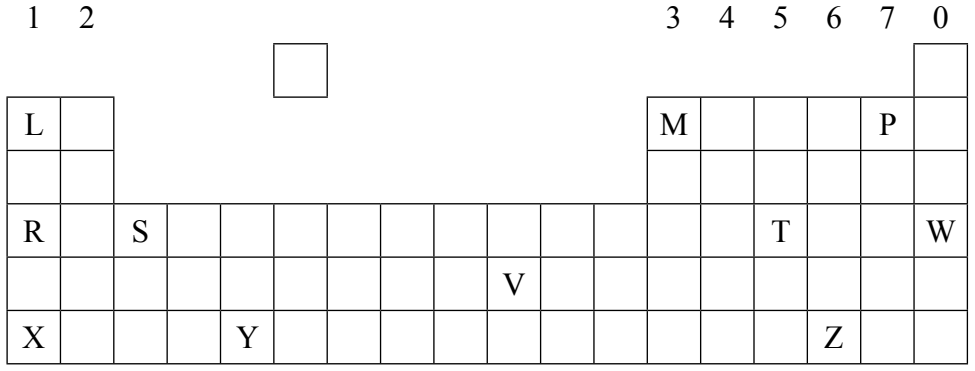
Foundation tier candidates do not answer any more questions after question 24.

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Questions 25 to 40 must be answered by Higher tier candidates only.
Foundation tier candidates do not answer questions 25 to 40.

The periodic table

In the periodic table below, letters are used to show the positions of some elements.
The letters are not the symbols of atoms of the elements.



25. Which letter shows the position of a transition metal in period 5 of the periodic table?

A V
B T
C X
D Y

26. Which letter shows the position of an alkali metal that is more reactive than potassium?

A L
B S
C X
D Y

27. Which letter shows the position of the element with atomic number 3?

A L
B M
C R
D S

28. Which letter shows the position of an element with chemical properties similar to bromine?

A P
B T
C W
D Z

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Halogens

29. In which of these mixtures would a displacement reaction occur?

A chlorine and potassium fluoride solution
B iodine and potassium chloride solution
C iodine and potassium bromide solution
D chlorine and potassium iodide solution

30. Which row of the table describes fluorine and iodine at room temperature?

	fluorine	**iodine**
A	yellow-green gas	grey solid
B	pale yellow gas	purple solid
C	pale yellow gas	grey solid
D	yellow-green gas	purple gas

31. Which of the following statements about the halogens are correct?

1 their reactivity increases as their atomic numbers increase
2 their boiling points decrease as their atomic numbers increase

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

32. Chlorine reacts with calcium bromide solution.
The equation for the reaction is

A $Cl + CaBr \rightarrow CaCl + Br$
B $Cl_2 + CaBr_2 \rightarrow CaCl_2 + Br_2$
C $2Cl + CaBr_2 \rightarrow CaCl_2 + 2Br$
D $Cl_2 + 2CaBr \rightarrow 2CaCl + Br_2$

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Salts

33. Sodium hydroxide solution was added to a solution of a salt.
A red-brown precipitate was formed.
The formula of the precipitate is

A $Fe(OH)_2$
B $Cu(OH)_2$
C $Zn(OH)_2$
D $Fe(OH)_3$

34. The salt calcium iodate contains the elements

A calcium and iodine only
B calcium and iron only
C calcium, iodine and oxygen
D calcium, iron and oxygen

35. Which of these substances will react together safely to produce a salt?

A potassium and dilute sulphuric acid
B potassium and ammonia solution
C dilute sulphuric acid and ammonia solution
D potassium chloride and dilute hydrochloric acid

36. Lead sulphate is an insoluble salt.
It can be prepared by precipitation.
The best way to produce a pure sample of lead sulphate is to

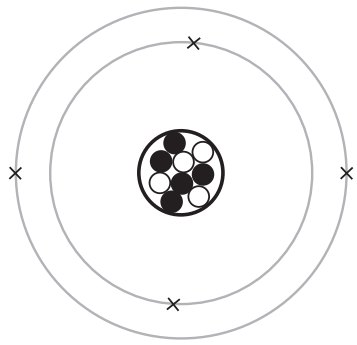
A add excess lead carbonate to dilute sulphuric acid
B add excess lead oxide to dilute sulphuric acid
C add lead nitrate solution to dilute sulphuric acid
D add excess lead to dilute sulphuric acid

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37. Sodium reacts with water.
The equation for this reaction is

A $Na + H_2O \rightarrow NaOH + H$
B $2Na + 2H_2O \rightarrow 2NaOH + H_2$
C $2Na + H_2O \rightarrow Na_2O + H_2$
D $Na + H_2O \rightarrow NaO + H_2$

38. Beryllium is a metal.
The diagram shows the positions of electrons, neutrons and protons in an atom of beryllium.



How many neutrons are in this atom?

A 4
B 5
C 9
D 13

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Useful products

39. Which of the following statements about ammonia are correct?

1 ammonia is used to manufacture nitric acid
2 ammonia turns moist red litmus paper blue

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

40. The equation represents the reaction that takes place when copper carbonate is heated.

$$CuCO_3 \rightarrow CuO + CO_2$$

Which of these statements about the reaction are correct?

1 the reaction is an example of thermal decomposition
2 during the reaction the copper carbonate is oxidised to copper oxide

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

END

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Mark Scheme (Results)
November 2010

GCSE

360Science

GCSE Science
Multiple Choice Paper C1a (5007)

GCSE Chemistry
Multiple Choice Paper C1a (5035)

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November 2010

Publications Code UG025884

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5007 Science/ 5035 Chemistry (C1a)

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7	B
8	D
9	D
10	C
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16	B

Unit C1a – 5007/5035 Topics 5 & 6	
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32	B
33	D
34	C
35	C
36	C
37	B
38	B
39	C
40	A

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Science (5007)

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C1a – Topics 5 and 6

Foundation and Higher Tier

Thursday 24 June 2010 – Afternoon

Time: 20 minutes

Materials required for examination	**Items included with question papers**
Multiple Choice Answer Sheet HB pencil, eraser and calculator	Nil

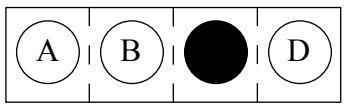
Instructions to Candidates

Use an HB pencil. Do not open this booklet until you are told to do so.
Mark your answers on the separate answer sheet.

Foundation tier candidates: answer questions 1 – 24.
Higher tier candidates: answer questions 17 – 40.
All candidates are to answer questions 17 – 24.

Before the test begins:
Check that the answer sheet is for the correct test and that it contains your candidate details.

How to answer the test:
For each question, choose the right answer, A, B, C or D and mark it in HB pencil on the answer sheet.
For example, the answer C would be marked as shown.



Mark only **one** answer for each question. If you change your mind about an answer, rub out the first mark **thoroughly**, then mark your new answer.

Do any necessary calculations and rough work in this booklet. You may use a calculator if you wish.

You must not take this booklet or the answer sheet out of the examination room.

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Turn over

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Questions 1 to 16 must be answered by Foundation tier candidates only.
Higher tier candidates start at question 17.

Lithium, potassium and sodium

Lithium is a metal.
Lithium reacts with cold water to produce hydrogen.

1. Lithium is

A a transition metal
B an alkali metal
C a halogen
D a noble gas

2. The test for hydrogen is that it

A relights a glowing splint
B pops when mixed with air and ignited
C turns limewater cloudy
D turns damp red litmus paper blue

3. The symbol for an atom of lithium is

A L
B li
C Li
D LI

4. Potassium is in the same group of the periodic table as lithium.
When potassium is added to cold water it is most likely to

A sink and react slowly
B react vigorously and give off hydrogen
C react vigorously and give off carbon dioxide
D float and show no reaction

5. An atom of lithium contains electrons, protons and neutrons.
Which of these particles are found in the nucleus of this atom?

A electrons and protons
B electrons and neutrons
C protons and electrons
D protons and neutrons

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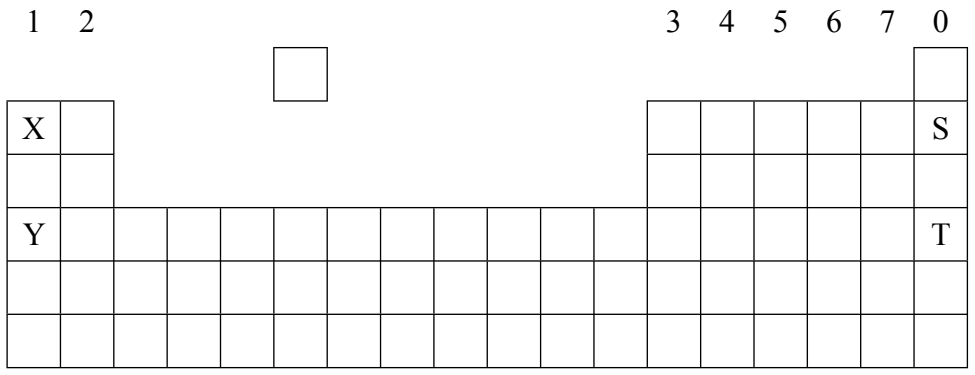
6. This hazard symbol is used on bottles which contain potassium and lithium.



This symbol shows that potassium and lithium are

A corrosive
B toxic
C explosive
D flammable

7. The positions of four elements in the periodic table are shown by the letters S, T, X and Y.
The letters shown are not the symbols of atoms of the elements.



Which letters show the positions of the metals lithium and potassium?

A X and S
B X and Y
C S and T
D Y and T

Salts

8. Lithium chloride, potassium chloride and sodium chloride are all colourless, crystalline solids.
Which of the following tests could be used to identify these solids?

A flame tests
B adding limewater
C testing with indicator paper
D applying a lighted splint

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9. Some salts can be made by reacting an acid with an alkali.
The reaction between the acid and alkali is called

A thermal decomposition
B combustion
C neutralisation
D a physical change

Making cakes

10. Baking powder is often used in cake mixtures.
The baking powder is used to

A make the cake rise
B add flavour
C preserve the cake
D help the cake set

11. Baking powder contains sodium hydrogencarbonate and an acidic substance.
Baking powder is

A an element
B a compound
C a mixture
D a solution

12. Some cakes contain artificial sweeteners.
Artificial means that the sweetener

A contains no chemical substances
B is man-made
C has no taste
D is obtained from sea water

13. When a cake is cooked, the cake mixture changes.
Cooking always causes

A a physical change
B a chemical change
C neutralisation
D precipitation

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Metal ores

14. Gold can be found uncombined in the Earth's crust.
The gold is uncombined because it is

A expensive
B rare
C unreactive
D an element

15. Iron ore is found in the Earth's crust.
Iron is extracted from its ore by

A electrolysis
B distillation
C heating with carbon
D heating with oxygen

16. The table shows some possible uses of gold, copper and iron.
Which row of the table is correct?

	use of gold	**use of copper**	**use of iron**
A	jewellery	electrical wiring	making steel
B	jewellery	making steel	electrical wiring
C	making steel	jewellery	making steel
D	making steel	electrical wiring	jewellery

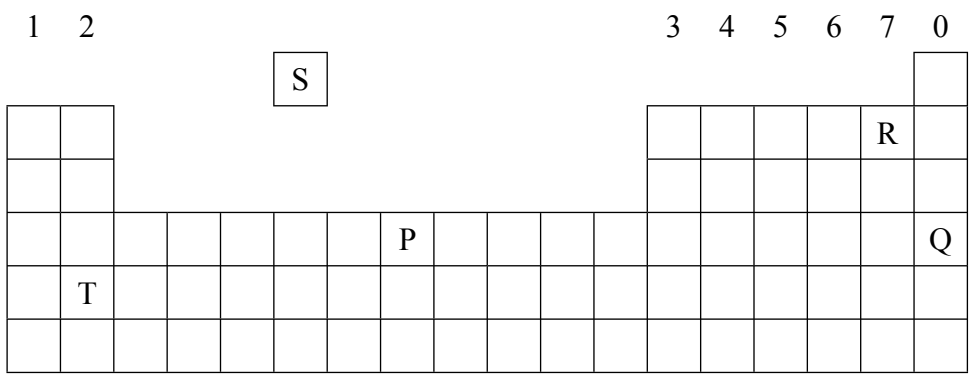
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Higher tier candidates start at question 17 and answer questions 17 to 40.
Questions 17 to 24 must be answered by all candidates: Foundation tier and Higher tier.

The periodic table

Use the following information to answer questions 17 to 19.

The positions of five elements in the periodic table are shown by letters P, Q, R, S and T.
The letters shown are not the symbols of atoms of the elements.



17. Which letter shows the position of an unreactive gas?

A P
B Q
C R
D S

18. Which letter shows the position of the transition metal, iron?

A P
B Q
C R
D T

19. In the periodic table, elements are arranged in order of increasing atomic number.
Which letter shows the position of the element with atomic number 9?

A P
B Q
C R
D T

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20. An atom of an element contains 19 electrons, 20 neutrons and 19 protons.

The element has an atomic number of

A 19
B 20
C 38
D 39

21. Which row in the table shows the correct charges on an electron, a neutron and a proton?

	electron	**neutron**	**proton**
A	negative	positive	no charge
B	negative	no charge	positive
C	no charge	positive	negative
D	positive	no charge	negative

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Calcium compounds

22. When calcium carbonate is heated strongly, calcium oxide is formed.
The equation for the reaction is

$$CaCO_3 \rightarrow CaO + CO_2$$

This reaction is an example of

A hydration
B neutralisation
C oxidation
D thermal decomposition

23. Calcium oxide can be used to make calcium hydroxide.
The equation for the reaction is

$$CaO + H_2O \rightarrow Ca(OH)_2$$

This reaction is an example of

A hydration
B neutralisation
C oxidation
D thermal decomposition

24. A solution of calcium hydroxide is used to test for

A oxygen
B carbon dioxide
C chlorine
D argon

TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS

Foundation tier candidates do not answer any more questions after question 24.

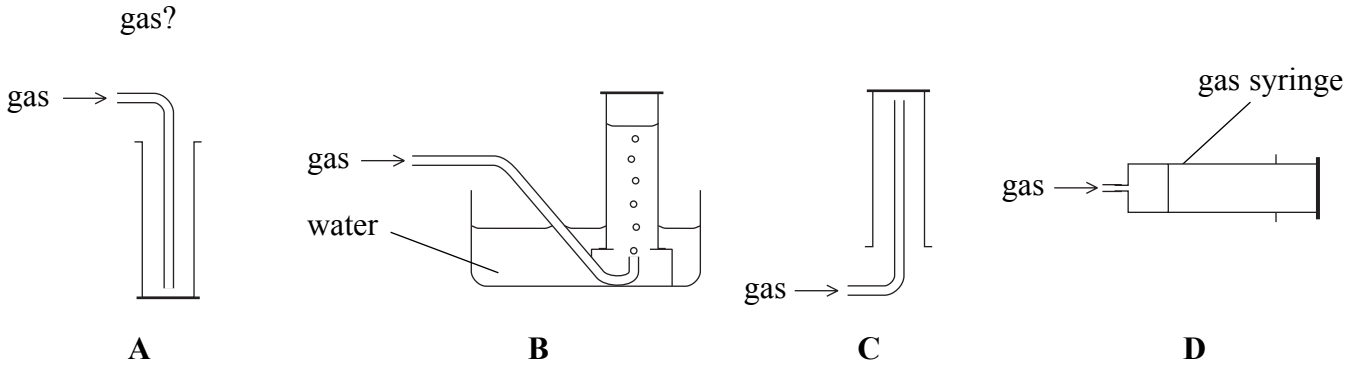
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Questions 25 to 40 must be answered by Higher tier candidates only.
Foundation tier candidates do not answer questions 25 to 40.

Detecting a gas

25. A gas has been produced by a chemist.
It is not known if the gas is soluble in water nor how dense it is.

Which diagram shows the method of collection that can be used whatever the properties of the gas?



A **B** **C** **D**

26. The chemist thought the gas might be ammonia.
To test if she was correct, she should test the gas with

A a lighted splint and expect a pop sound
B a glowing splint and expect the splint to relight
C moist red litmus paper and expect the litmus paper to turn blue
D limewater and expect the limewater to go milky

27. The formula of a molecule of ammonia is

A NH^3
B NH_3
C N_3H
D NH_4

28. Which of the following statements about ammonia are true?

1 ammonia can be used to make nitric acid
2 ammonia is more dense than air and is collected by downward delivery

A 1 only
B 2 only
C 1 and 2
D neither 1 nor 2

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Salts

29. Lead nitrate solution is reacted with potassium iodide solution.
A precipitate of lead iodide is formed.
A pure, dry sample of the lead iodide could be obtained from the reaction mixture by

A evaporating
B filtering, then drying
C filtering, then washing, then drying
D washing, then filtering, then drying

30. KNO_3 is the formula of a salt.
The name of this salt is

A potassium nitride
B potassium nitrogen oxide
C potassium nitrate
D potassium nitro-oxide

31. Salts of copper, potassium and sodium are used to produce colours in firework flames.
Which row of the table shows the correct colour produced by each of these salts?

	copper salt	**potassium salt**	**sodium salt**
A	green-blue	yellow	lilac
B	green-blue	lilac	yellow
C	lilac	green-blue	yellow
D	lilac	yellow	green-blue

32. The balanced equation for the reaction of calcium carbonate with hydrochloric acid is

A $CaCO_3 + HCl \rightarrow CaCl + H_2O + CO_2$
B $CaCO_3 + HCl_2 \rightarrow CaCl_2 + H_2O + CO_2$
C $CaCO_3 + 2HCl \rightarrow CaCl_2 + H_2O + CO_2$
D $CaCO_3 + H_2Cl \rightarrow CaCl + H_2O + CO_2$

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Halogens

33. Which row of the table shows a halogen with its correct colour and state at room temperature?

	halogen	**colour**	**state at room temperature**
A	fluorine	pale yellow	gas
B	chlorine	grey	solid
C	bromine	yellow-green	liquid
D	iodine	purple	solid

34. Which of these statements about the halogens are correct?

1 the halogens all exist as diatomic molecules
2 the halogens increase in reactivity with increasing atomic number

A 1 only
B 2 only
C 1 and 2
D neither 1 nor 2

35. Chlorine reacts with potassium bromide solution.
The equation for the reaction is

A $Cl + KBr \rightarrow KCl + Br$
B $Cl_2 + 2KBr \rightarrow 2KCl + 2Br$
C $Cl_2 + KBr_2 \rightarrow KCl_2 + Br_2$
D $Cl_2 + 2KBr \rightarrow 2KCl + Br_2$

Acids

36. The table shows some possible uses of ethanoic acid, citric acid and phosphoric acid.
Which row of the table is correct?

	use of ethanoic acid	**use of citric acid**	**use of phosphoric acid**
A	as food flavouring	in rust remover	as vinegar
B	in rust remover	as food flavouring	as vinegar
C	in rust remover	as vingear	as food flavouring
D	as vinegar	as food flavouring	in rust remover

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Metals and their ores

37. Many metals can be found in the Earth's crust.
Platinum is found uncombined.
Aluminium is extracted using electrolysis.
Lead is extracted using carbon.

Which is the correct order of reactivity of platinum, aluminium and lead?

	most reactive ⟶		**least reactive**
A	aluminium	platinum	lead
B	platinum	lead	aluminium
C	aluminium	lead	platinum
D	lead	aluminium	platinum

38. When copper oxide is heated in hydrogen, copper is produced.

$$CuO + H_2 \rightarrow Cu + H_2O$$

Which of these statements about this reaction are correct?

1 copper oxide is reduced
2 the reaction is a dehydration reaction

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

39. When sodium hydroxide solution is added to copper sulphate solution, a precipitate forms.
The colour of the precipitate is

A pale green
B red-brown
C pale blue
D white

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40. The equation for the reaction between sodium hydroxide solution and copper sulphate solution is

$$CuSO_4 + \mathbf{x}NaOH \rightarrow \mathbf{y}Na_2SO_4 + \mathbf{z}Cu(OH)_2$$

Which row of the table shows values of **x**, **y** and **z** that give a balanced equation?

	x	**y**	**z**
A	2	1	2
B	2	1	1
C	2	2	1
D	2	2	2

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

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5007 Science/ 5035 Chemistry (C1a)

Unit C1a – 5007/5035	
Topics 5 & 6	
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4	B
5	D
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7	B
8	A
9	C
10	A
11	C
12	B
13	B
14	C
15	C
16	A

Unit C1a – 5007/5035	
Topics 5 & 6	
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19	C
20	A
21	B
22	D
23	A
24	B

Unit C1a – 5007/5035	
Topics 5 & 6	
25	D
26	C
27	B
28	A
29	C
30	C
31	B
32	C
33	A
34	A
35	D
36	D
37	C
38	A
39	C
40	B

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Edexcel GCSE

Science (5007)

Chemistry (5035)

C1a – Topics 5 and 6

Foundation and Higher Tier

Friday 5 March 2010 – Morning

Time: 20 minutes

Materials required for examination	**Items included with question papers**
Multiple Choice Answer Sheet HB pencil, eraser and calculator	Nil

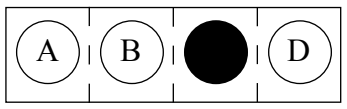
Instructions to Candidates

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Mark your answers on the separate answer sheet.

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Do any necessary calculations and rough work in this booklet. You may use a calculator if you wish.

You must not take this booklet or the answer sheet out of the examination room.

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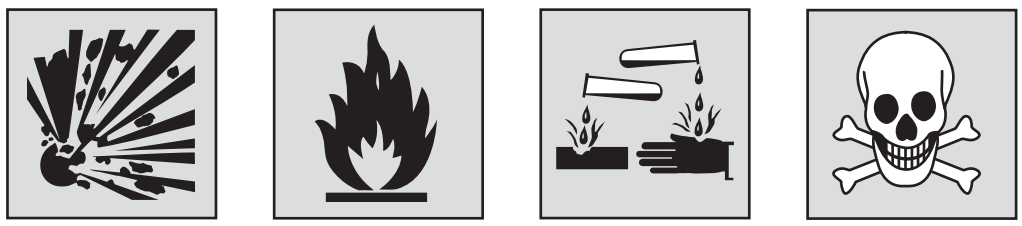
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Questions 1 to 16 must be answered by Foundation tier candidates only.
Higher tier candidates start at question 17.

Chlorine

1. Chlorine is a toxic gas.
Which of these hazard symbols is used to show that chlorine is toxic?

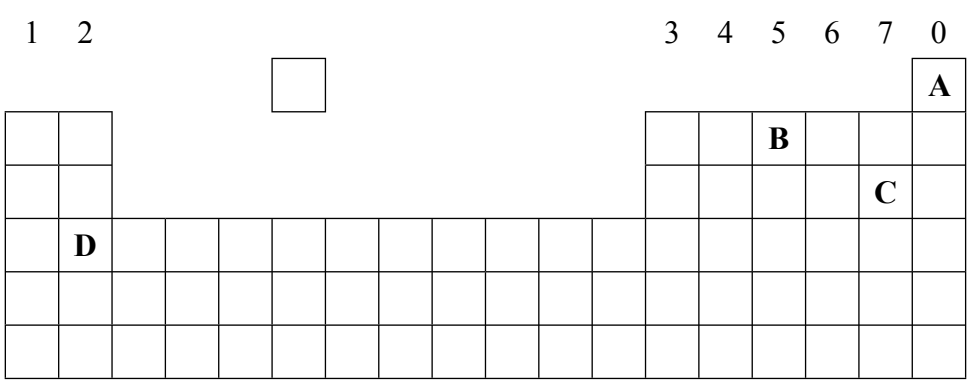


A **B** **C** **D**

2. Chlorine is used

A in fizzy drinks
B to kill bacteria in drinking water
C in fire extinguishers
D to flavour food

3. Chlorine is a halogen.
Which letter shows the position of chlorine in the periodic table?



4. A test for chlorine is that the gas

A relights a glowing splint
B turns limewater cloudy
C burns with a blue flame
D turns moist blue litmus paper red then white

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5. Chlorine gas is

A yellow-green
B red-brown
C colourless
D purple

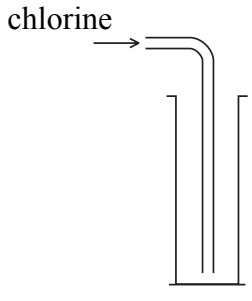
6. Chlorine and bromine are in the same group of the periodic table.
Which of these statements about chlorine and bromine is correct?

A they are both unreactive
B they are the same colour
C they have similar chemical properties
D they are both gases at room temperature and pressure

7. The symbol for an atom of chlorine is

A Ch
B C
C CL
D Cl

8. Chlorine can be collected by downward delivery.



This method is used because chlorine gas is

A insoluble in water
B toxic
C less dense than air
D more dense than air

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Making pancakes

John is making a type of pancake.
He uses these ingredients to form a mixture.

flour
milk
baking powder
common salt
sugar
eggs
olive oil

9. When the mixture is cooked it changes into pancakes.
This is because

A chemical changes have taken place
B physical changes have taken place
C the milk has boiled
D the baking powder has evaporated

10. Common salt is

A sodium
B calcium carbonate
C sodium chloride
D lead chloride

11. John could replace the sugar with an artificial sweetener.
Artificial means

A healthier
B man-made
C difficult to obtain
D pure

12. The baking powder contains sodium hydrogencarbonate and cream of tartar.
These substances react to form carbon dioxide.
This means cream of tartar must

A be acidic
B be alkaline
C help to make the pancakes sweet
D add colour to the pancakes

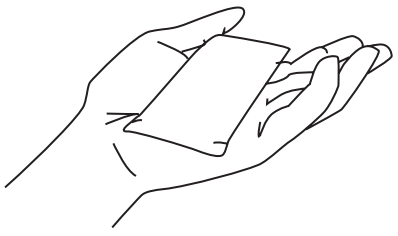
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13. The baking powder in the mixture makes this type of pancake

A rise
B set
C moist
D spread

Iron and rust

14. Some hand-warmers contain a mixture of substances, including iron powder, in a cloth bag.



Heat is produced by iron powder in this mixture reacting with oxygen from the air.
This type of reaction is

A neutralisation
B exothermic
C thermal decomposition
D endothermic

15. The reaction of iron with oxygen occurs when iron objects rust.
When iron rusts, a rise in temperature is difficult to detect.
This is because rusting is

A a slow physical change
B a fast physical change
C a slow chemical change
D a fast chemical change

16. Iron is mainly extracted from

A limestone
B steel
C slag
D ore

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Higher tier candidates start at question 17 and answer questions 17 to 40.
Questions 17 to 24 must be answered by all candidates: Foundation tier and Higher tier

Metals and their salts

17. Zinc can be obtained from zinc oxide by heating the zinc oxide with

A copper
B oxygen
C carbon
D carbon dioxide

18. Aluminium has to be extracted from aluminium oxide by electrolysis.
This shows that

A aluminium has a very high melting point
B aluminium is a reactive metal
C aluminium oxide is unstable when heated
D aluminium oxide has a very high melting point

19. Magnesium reacts with steam (water) to produce magnesium oxide and hydrogen.

$$\text{magnesium} + \text{water} \rightarrow \text{magnesium oxide} + \text{hydrogen}$$

During this reaction the magnesium is

A dehydrated
B hydrated
C oxidised
D reduced

20. If sodium hydroxide solution is added to a solution of a copper salt, the precipitate produced is

A brown
B white
C green
D blue

21. A flame test was carried out on a sample of potassium chloride.
The colour of the flame should be

A yellow
B blue
C red
D lilac

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22. The metals lithium, potassium and sodium all react with cold water.
The order of reactivity, from the most reactive to the least reactive, is

A lithium, potassium, sodium
B lithium, sodium, potassium
C potassium, sodium, lithium
D sodium, potassium, lithium

23. When lithium reacts with water, hydrogen is produced.
The word equation for the reaction is

A lithium + water → lithium hydroxide + hydrogen
B lithium + water + oxygen → lithium oxide + hydrogen
C lithium + water → lithium hydride + hydrogen
D lithium + water + oxygen → lithium hydroxide + hydrogen

24. At high temperatures, lead oxide reacts with carbon monoxide.
The word equation for the reaction is

lead oxide + carbon monoxide → lead + carbon dioxide

In this reaction, the lead oxide undergoes

A thermal decomposition
B neutralisation
C oxidation
D reduction

TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS

Foundation tier candidates do not answer any more questions after question 24.

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Questions 25 to 40 must be answered by Higher tier candidates only.
Foundation tier candidates do not answer questions 25 to 40.

Elements in the periodic table

Use the following information to answer questions 25 to 27.

An atom of an element contains 5 protons, 6 neutrons and some electrons.

25. How many electrons will this atom contain?

A 1
B 5
C 6
D 11

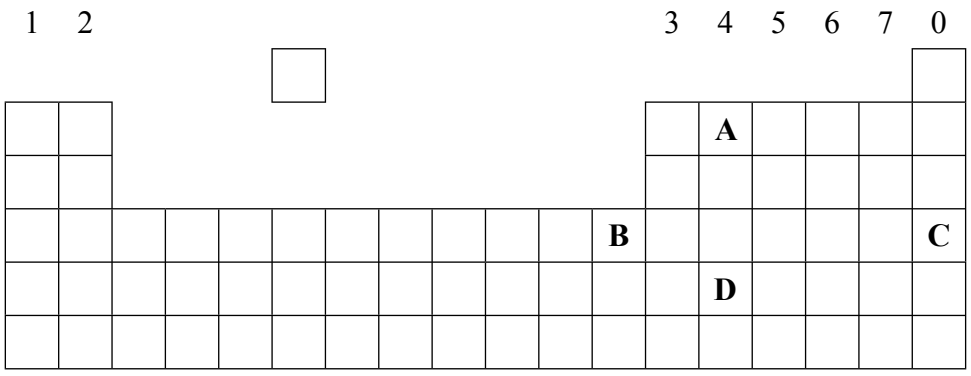
26. What is the atomic number of this element?

A 1
B 5
C 6
D 11

27. The nucleus of this atom contains

A protons only
B neutrons and protons
C neutrons only
D electrons and protons

28. Which letter shows the position of a non-metal in period 4 of the periodic table?



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29. Which of these statements about the periodic table are correct?

1 In modern versions of the periodic table the elements are arranged in order of increasing atomic number
2 The periodic table has been used to predict the existence and properties of new elements

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

Salt preparations

Use the following information to answer questions 30 and 31.

Copper sulphate can be prepared by reacting excess copper oxide with warm dilute sulphuric acid.

30. What should be observed during the reaction?

A the liquid turning blue
B a white suspension
C bubbles of gas
D a brown solid forming

31. Which of these statements about this preparation are correct?

1 The reaction taking place is oxidation
2 Pure copper sulphate can be obtained by evaporation of the mixture of copper oxide and copper sulphate solution

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

32. Copper oxide reacts with warm dilute hydrochloric acid to form copper chloride.
The correct balanced equation for the reaction is

A $2CuO + 2HCl \rightarrow 2CuCl + H_2 + O_2$
B $CuO + H_2Cl \rightarrow CuCl + H_2O$
C $CuO + 2HCl \rightarrow CuCl_2 + H_2O$
D $2CuO + 2HCl \rightarrow Cu_2Cl_2 + H_2O$

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33. Potassium chlorate is a salt.
Its formula could be

A KCl
B K_2O
C K_2CO_3
D KClO

Use the following information to answer questions 34 and 35.

Lead chloride is a salt which is insoluble in cold water.

34. The best method of preparing pure lead chloride would be to react

A excess lead metal with dilute hydrochloric acid
B excess lead oxide with dilute hydrochloric acid
C lead nitrate solution with dilute hydrochloric acid
D excess lead carbonate with dilute hydrochloric acid

35. Lead chloride is obtained mixed with a solution of soluble salts.
A pure, dry sample of lead chloride could be obtained from this mixture by

A evaporation
B filtering and drying
C filtering, washing and drying
D crystallisation

36. When a salt is heated it decomposes to produce three products.
The equation for the reaction is

$$2KHCO_3 \rightarrow K_2CO_3 + H_2O + CO_2$$

Which of these statements about the reaction are correct?

1 The salt that decomposes is potassium carbonate
2 The reaction taking place is hydration

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

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Halogens

37. Which of the following describes the colour and state at room temperature and pressure of one of the halogens?

A purple solid
B red-brown liquid
C purple gas
D yellow-green liquid

38. Which row of the table shows two correct uses for sodium chloride?

	use 1	use 2
A	making chlorine	preserving food
B	preserving food	bleaching paper
C	as a fertiliser	making chlorine
D	bleaching paper	as a fertiliser

39. Which of the following will **not** result in a displacement reaction?

A fluorine and potassium iodide solution
B bromine and potassium iodide solution
C iodine and potassium bromide solution
D chlorine and potassium bromide solution

40. Which equation correctly represents the reaction between chlorine and potassium iodide solution?

A $Cl_2 + KI \rightarrow KCl_2 + I$
B $Cl_2 + 2KI \rightarrow KCl + 2I$
C $Cl + KI_2 \rightarrow KCl + I_2$
D $Cl_2 + 2KI \rightarrow 2KCl + I_2$

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

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5007 Science/ 5035 Chemistry (C1a)

Unit C1a – 5007/5035	
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3	C
4	D
5	A
6	C
7	D
8	D
9	A
10	C
11	B
12	A
13	A
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Unit C1a – 5007/5035	
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40	D

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Foundation and Higher Tiers

Friday 20 November 2009 – Morning

Time: 20 minutes

Materials required for examination
Multiple Choice Answer Sheet
HB pencil, eraser and calculator

Items included with question papers
Nil

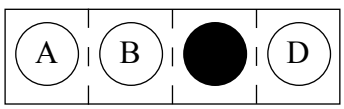
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Questions 1 to 16 must be answered by Foundation tier candidates only.
Higher tier candidates start at question 17.

Gases

1. Helium and hydrogen are gases which are less dense than air.
Helium is used to fill airships.



Helium is used instead of hydrogen because

A helium is coloured but hydrogen is colourless
B helium is unreactive but hydrogen burns in air
C hydrogen is a good conductor of electricity
D helium is a good conductor of heat

2. The correct symbol for an atom of hydrogen is

A Hy
B hy
C H
D H_2

3. A test for hydrogen is that

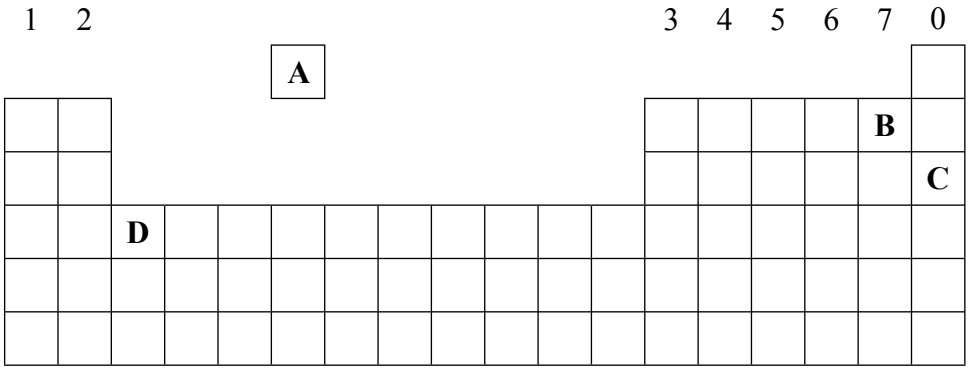
A when mixed with air and lit, it burns with a squeaky pop
B it relights a glowing splint
C it turns limewater milky
D it turns red litmus solution blue

4. Helium and argon are in the same group in the periodic table.
Helium and argon

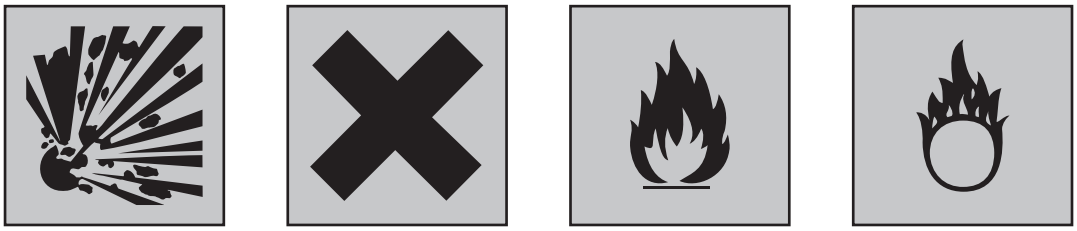
A form similar compounds
B are both unreactive
C burn in air
D react together

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5. Argon is a noble gas.
Which letter shows the position of argon in the periodic table?



6. Which of these hazard symbols should be used to show that hydrogen is flammable?



A **B** **C** **D**

Potassium chloride

7. Potassium chloride is a

A non-metallic element
B mixture
C salt
D metallic element

8. Potassium chloride can be made by reacting potassium hydroxide solution with dilute hydrochloric acid.
This reaction is an example of

A neutralisation
B thermal decomposition
C hydration
D oxidation

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9. Which of the following could be used to show that potassium chloride is a potassium compound?

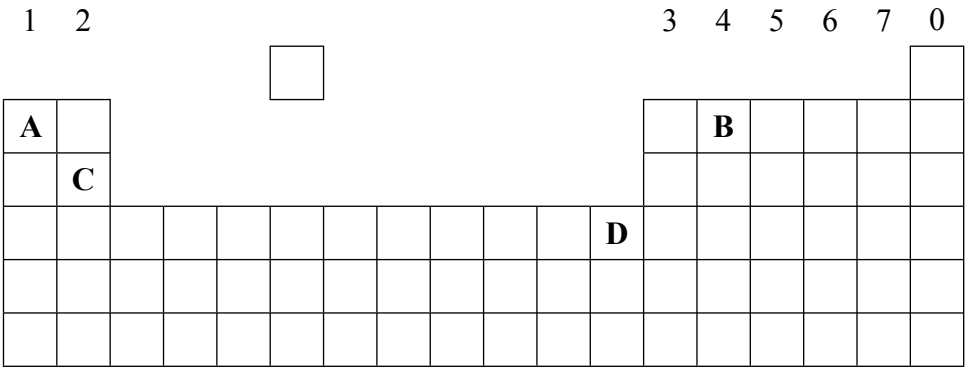
A a flame test
B universal indicator paper
C hydrochloric acid
D sodium hydroxide solution

10. Potassium chloride is one of the salts present in sea water.
Potassium chloride obtained from sea water

A is artificial
B is a pollutant
C is natural
D has a different composition from that made by a chemical reaction

Metals and their compounds

11. The letters show the position of three metals and one non-metal in the periodic table.
Which letter shows the position of the non-metal?



12. Iron is a metal.
Iron is usually found in the Earth's crust as

A steel
B an alloy
C an ore
D the metal

13. Gold is an unreactive metal.
Gold is usually found in the Earth's crust as

A a salt
B an oxide
C a compound
D the metal

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14. Silver is used to make jewellery because it

A is a non-metal
B is usually unreactive
C is in group 1 of the periodic table
D has a very low melting point

15. John mixes sodium hydroxide solution with copper sulphate solution.
What should he see?

A bubbles of gas
B a green solid
C a blue solid
D a colourless solution

16. Copper is used to make water pipes because it

A is brittle
B conducts electricity
C is malleable
D is shiny

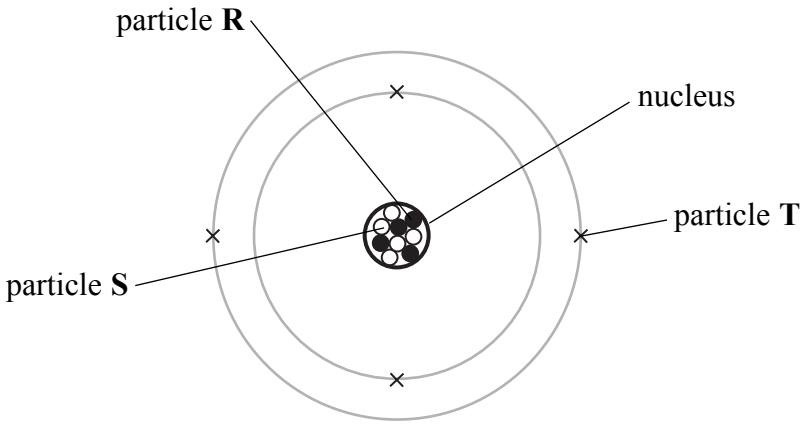
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Higher tier candidates start at question 17 and answer questions 17 to 40.
Questions 17 to 24 must be answered by all candidates: Foundation tier and Higher tier.

Atoms

Use the following information to answer questions 17 to 19.

This diagram shows the particles in an atom of beryllium.



17. Which row of the table correctly describes particles **R** and **S**?

	particle R	**particle S**
A	electron	neutron
B	proton	electron
C	neutron	electron
D	proton	neutron

18. What is the atomic number of beryllium?

A 2
B 4
C 5
D 9

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19. Which row of the table shows the charge on a proton, a neutron and an electron?

	proton	neutron	electron
A	positive	positive	negative
B	no charge	positive	negative
C	negative	no charge	positive
D	positive	no charge	negative

20. Magnesium and beryllium have similar properties.
For example, the formulae of their chlorides are $MgCl_2$ and $BeCl_2$.
In the periodic table, magnesium is most likely to be

A in the same group and period as beryllium
B in the same group but a different period from beryllium
C in a different group and the same period as beryllium
D in a different group and a different period from beryllium

Metals

21. Lead is obtained from a substance called galena.
Galena is converted into lead oxide.
Lead is obtained from lead oxide by

A adding dilute hydrochloric acid
B heating with carbon
C heating with nitrogen
D heating in the absence of air

22. Lead can also be obtained from lead oxide by passing hydrogen over the heated lead oxide.
The reaction is

$$\text{lead oxide} + \text{hydrogen} \rightarrow \text{lead} + \text{water}$$

During this reaction the hydrogen is

A hydrated
B dehydrated
C oxidised
D reduced

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23. Aluminium is extracted from aluminium oxide by electrolysis.
It is necessary to use electrolysis because

A aluminium is a reactive metal and its oxide is stable
B aluminium is an unreactive metal and its oxide is stable
C aluminium is a reactive metal and its oxide is unstable
D aluminium is an unreactive metal and its oxide is unstable

24. Corrosion is a problem when using some metals.
One product of corrosion is rust.
Which row of the table shows a metal that rusts and a substance used in rust removers?

	metal	**used in rust removers**
A	iron	sodium chloride
B	aluminium	sodium chloride
C	iron	phosphoric acid
D	aluminium	phosphoric acid

TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS

Foundation tier candidates do not answer any more questions after question 24.

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Questions 25 to 40 must be answered by Higher tier candidates only.
Foundation tier candidates do not answer questions 25 to 40.

Carbon dioxide

25. The test to show that a gas is carbon dioxide is that the gas

A puts out a burning splint
B turns moist red litmus paper blue
C turns limewater milky
D dissolves in water to form an acidic solution

26. Baking powder contains

A sodium hydrogencarbonate only
B sodium hydrogencarbonate and another substance
C sodium carbonate only
D sodium carbonate and another substance

27. If water is added to baking powder, carbon dioxide is produced.
The reaction taking place is

A dehydration
B neutralisation of an acid
C thermal decomposition
D oxidation

28. When copper carbonate is heated the reaction is

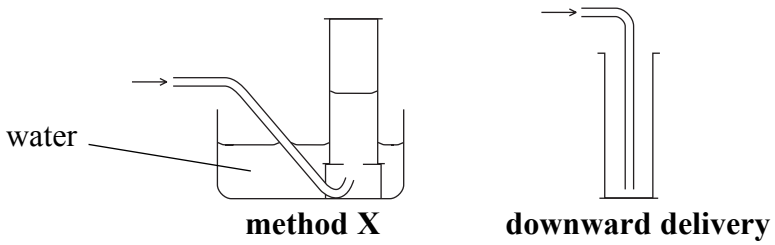
$$\text{copper carbonate} \rightarrow \text{copper oxide} + \text{carbon dioxide}$$

This reaction is an example of

A oxidation
B reduction
C thermal decomposition
D neutralisation

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29. Carbon dioxide gas can be collected by the two methods shown.



Which row of the table describes method **X** and two properties of carbon dioxide?

	method X	**solubility in water**	**density compared to air**
A	upward delivery	slightly soluble	less dense
B	over water	very soluble	more dense
C	upward delivery	very soluble	more dense
D	over water	slightly soluble	more dense

30. Which of these is the balanced equation for the reaction that takes place when zinc carbonate is heated?

A $ZnCO_2 \rightarrow Zn + CO_2$
B $2ZnCO_3 \rightarrow 2Zn + 2CO_2 + O_2$
C $ZnCO_3 \rightarrow ZnO + CO_2$
D $2ZnCO_3 \rightarrow 2ZnO + 2CO + O_2$

Ammonia

31. Which of these statements about ammonia are correct?

1 It turns moist blue litmus paper red
2 The formula of its molecule is NH_4

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

32. Which row of the table shows correct uses for ammonia?

	to make fertilisers	**to make nitric acid**
A	yes	no
B	no	yes
C	yes	yes
D	no	no

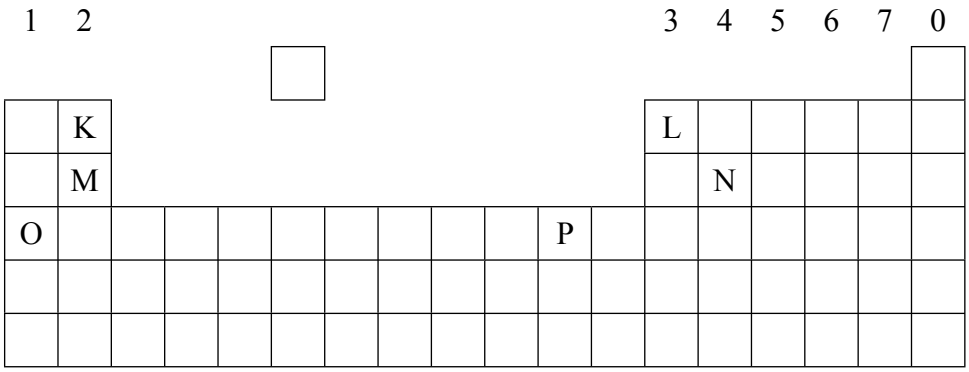
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33. Ammonium nitrate contains the elements

A ammonia, nitrogen and oxygen
B hydrogen, nitrogen and oxygen
C ammonium, nitrogen and oxygen
D hydrogen and nitrogen only

Metals

Use this periodic table to answer questions 34 to 36.



The letters shown are not the symbols of the atoms of the elements.

34. Which letter shows a metal in period 3?

A L
B M
C N
D O

35. Which letter shows an element that causes salts to produce a lilac flame in a flame test?

A M
B N
C O
D P

36. Which letter shows an element that has salts that, in solution, produce a pale blue precipitate with sodium hydroxide solution?

A K
B M
C O
D P

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37. Which of these statements about the alkali metals are correct?

1 Their reactivity increases from lithium to caesium
2 They all have an endothermic reaction with water

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

38. Which row of the table shows the correct colours at room temperature and the boiling points of the halogens bromine and iodine?

	bromine		**iodine**	
	colour at room temperature	**boiling point (°C)**	**colour at room temperature**	**boiling point (°C)**
A	yellow-green	–34	purple	184
B	red-brown	–34	grey	59
C	red-brown	59	purple	184
D	red-brown	59	grey	184

Use the following information to answer questions 39 and 40.

Chlorine reacts with sodium iodide solution.

39. Which of these statements about the reaction are correct?

1 After the reaction the solution is colourless
2 The reaction takes place because iodine is more reactive than chlorine

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

40. The equation for this reaction is

A $Cl_2 + 2NaI \rightarrow 2NaCl + I_2$
B $Cl + NaI \rightarrow NaCl + I$
C $Cl_2 + NaI \rightarrow NaCl + ICl$
D $Cl_2 + NaI_2 \rightarrow NaCl_2 + I_2$

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

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Mark Scheme (Results)
November 2009

GCSE

360Science

GCSE Science
Multiple Choice Paper C1a (5007)

GCSE Chemistry
Multiple Choice Paper C1a (5035)

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November 2009

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5007 Science/ 5035 Chemistry (C1a)

Unit C1a – 5007/5035	
Topics 5 & 6	
1	B
2	C
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4	B
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7	C
8	A
9	A
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Topics 5 & 6	
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24	C

Unit C1a – 5007/5035	
Topics 5 & 6	
25	C
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30	C
31	D
32	C
33	B
34	B
35	C
36	D
37	A
38	D
39	D
40	A

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Science (5007)

Chemistry (5035)

C1a – Topics 5 and 6

Foundation and Higher Tiers

Friday 19 June 2009 – Morning

Time: 20 minutes

Materials required for examination
Multiple Choice Answer Sheet
HB pencil, eraser and calculator

Items included with question papers
Nil

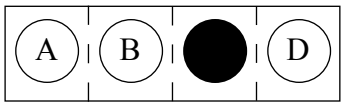
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Foundation tier candidates: answer questions 1 – 24.
Higher tier candidates: answer questions 17 – 40.
All candidates are to answer questions 17 – 24.

Before the test begins:
Check that the answer sheet is for the correct test and that it contains your candidate details.

How to answer the test:
For each question, choose the right answer, A, B, C or D and mark it in HB pencil on the answer sheet.
For example, the answer C would be marked as shown.



Mark only **one** answer for each question. If you change your mind about an answer, rub out the first mark **thoroughly**, then mark your new answer.

Do any necessary calculations and rough work in this booklet. You may use a calculator if you wish.

You must not take this booklet or the answer sheet out of the examination room.

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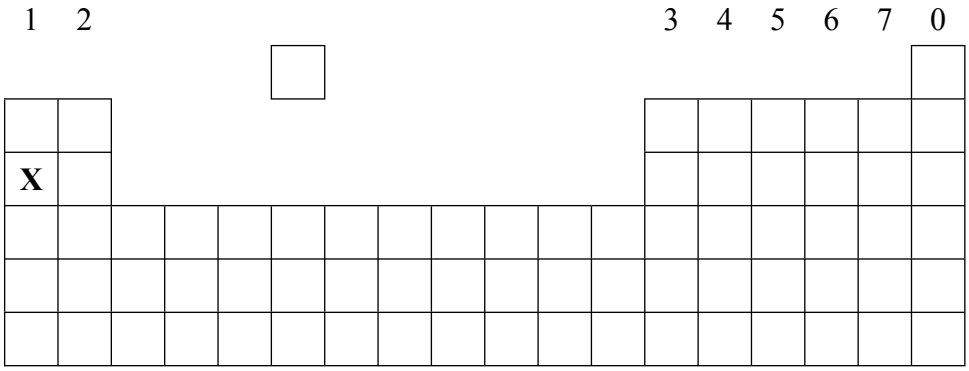
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Questions 1 to 16 must be answered by Foundation tier candidates only.
Higher tier candidates start at question 17.

Sodium and its compounds

1. Sodium is an element.
The position of sodium in the periodic table is shown by **X**



Sodium is

A a reactive non-metal
B an unreactive non-metal
C an unreactive transition metal
D a reactive alkali metal

2. Sodium reacts with chlorine to form sodium chloride.
Sodium chloride is

A a mixture
B a metallic element
C a non-metallic element
D a compound

3. Sodium chloride is used as

A table salt
B vinegar
C a bleach
D a fertiliser

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4. This hazard symbol is used on bottles of sodium hydroxide.



It shows that sodium hydroxide is

A corrosive
B toxic
C flammable
D explosive

5. Another name for sodium hydroxide is

A ammonia
B caustic soda
C ethanoic acid
D citric acid

6. Baking powder contains sodium hydrogencarbonate.
Baking powder is used in cake mixtures to

A make the cake brown
B sweeten the cake
C stop the cake from sticking to the tin
D make the cake rise during cooking

7. When sodium hydrogencarbonate is heated it forms carbon dioxide.
The word equation for the reaction taking place is

sodium hydrogencarbonate $\rightarrow$ sodium carbonate + carbon dioxide + water

This reaction is

A combustion
B thermal decomposition
C neutralisation
D hydration

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Unreactive elements

8. Argon is very unreactive.
It is

A a noble gas
B a halogen
C an alkali metal
D a transition metal

9. The correct symbol for an atom of argon is

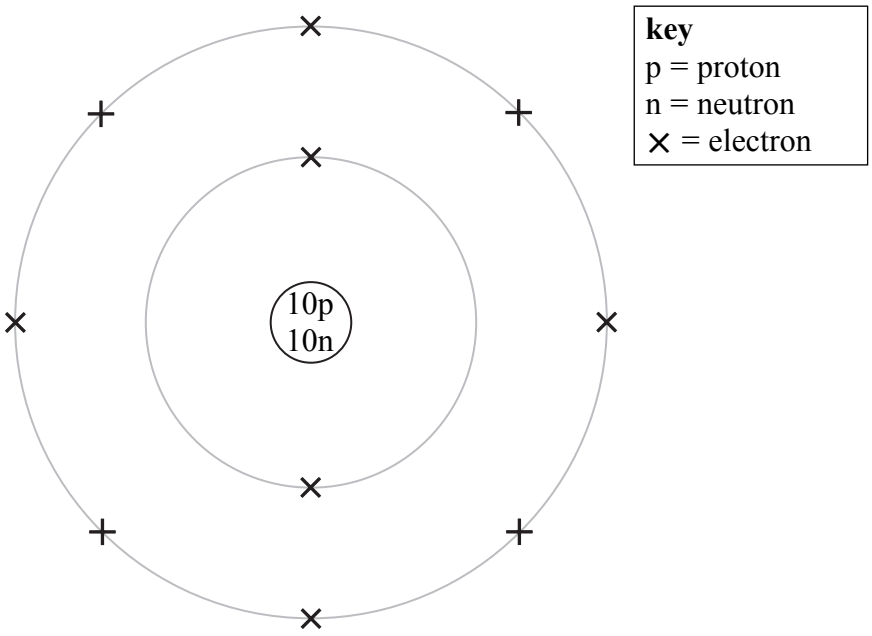
A A
B Ag
C Ar
D Ar

10. Helium and neon are in the same group of the periodic table.
Helium and neon

A burn in air
B react with water
C are inert
D form stable compounds

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11. The diagram shows the particles in an atom of neon.



The atomic number of neon is

A 8
B 10
C 20
D 30

12. Helium is another unreactive substance.
It is used to fill weather balloons and airships.
Helium is used for this purpose because

A it is a liquid at room temperature
B it is an element
C it is less dense than air
D its molecules are large

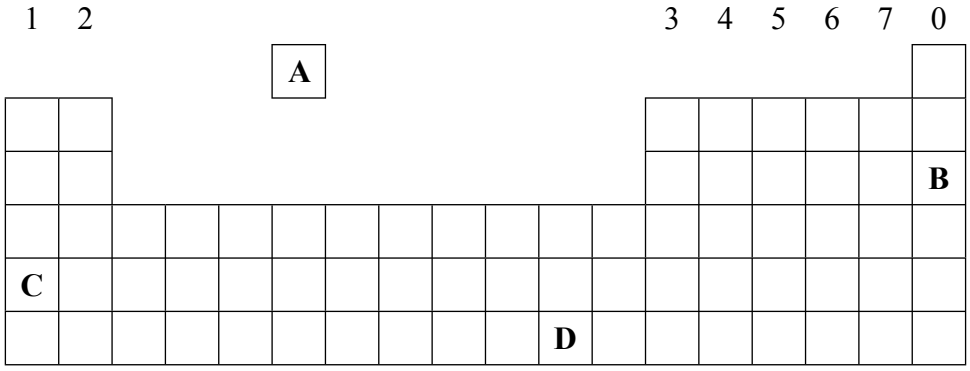
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Metals

13. Some gold jewellery was found in a tomb in Egypt.
The jewellery was in good condition after thousands of years.
It had remained in good condition because pure gold

A is very hard
B has a low density
C is very unreactive
D can be recognised by its colour

14. Gold is a transition metal.
Which letter shows the position of gold in the periodic table?



15. Gold is obtained

A by extracting it from its ore using electrolysis
B as gold metal from the ground
C by extracting it from its ore using carbon
D by oxidation of its ore

16. Zinc is another metal.
Tony added a few drops of sodium hydroxide solution to a solution of a zinc salt.
He should have seen

A a blue precipitate
B bubbles of gas
C no visible change
D a white precipitate

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Higher tier candidates start at question 17 and answer questions 17 to 40.
Questions 17 to 24 must be answered by all candidates: Foundation tier and Higher tier.

Preparing calcium chloride

Use the following information to answer questions 17 to 19.

Excess calcium carbonate reacts with dilute hydrochloric acid to form a solution of the salt calcium chloride.
The word equation for the reaction is

calcium carbonate + hydrochloric acid → calcium chloride + carbon dioxide + water

17. What will be observed during this reaction?

A a very bad smell
B a change in colour
C bubbles of gas
D a solid precipitate forming

18. During this reaction the dilute hydrochloric acid is

A evaporated
B thermally decomposed
C reduced
D neutralised

19. Heat is given out during the reaction.
This shows that the reaction

A is exothermic
B is endothermic
C could be exothermic or endothermic
D is neither exothermic nor endothermic

20. The test for carbon dioxide is that it

A relights a glowing splint
B turns universal indicator blue
C turns limewater milky
D burns when a lighted splint is applied

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21. If calcium chloride is tested using a flame test, it produces an orange-red colour in the flame. The colour is caused by the

A wire used
B calcium in the compound
C chlorine in the compound
D hydrochloric acid used

22. Anhydrous calcium chloride can be used to dry gases.
The water is removed when the anhydrous calcium chloride reacts with it.
This reaction is an example of

A neutralisation
B reduction
C hydration
D hydrogenation

23. The formula of hydrochloric acid is

A HCL
B Hcl
C HCl_2
D HCl

24. Potassium bromide is a soluble salt.
Which of these processes must be used to form a sample of solid potassium bromide from a solution of the salt?

A hydration
B evaporation
C condensation
D filtration

TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS

Foundation tier candidates do not answer any more questions after question 24.

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Questions 25 to 40 must be answered by Higher tier candidates only.
Foundation tier candidates do not answer questions 25 to 40.

Lead oxide

Use the following information to answer questions 25 and 26.

Lead oxide can be changed into lead by passing hydrogen over heated lead oxide.
The equation for the reaction is

$$PbO + H_2 \rightarrow Pb + H_2O$$

25. During this reaction the lead oxide is

A hydrated
B dehydrated
C oxidised
D reduced

26. During this reaction the hydrogen is

A hydrated
B dehydrated
C oxidised
D reduced

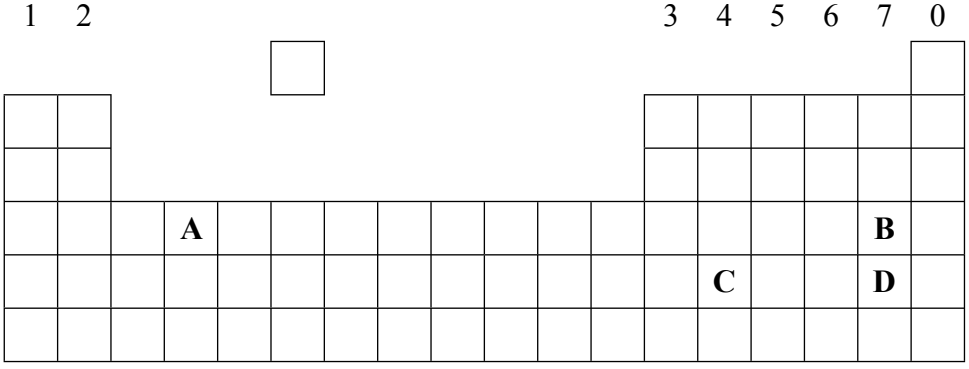
27. Lead can also be obtained by heating lead oxide with

A oxygen
B carbon
C nitrogen
D copper

The halogens

28. Bromine is a halogen in period 4 of the periodic table.

Which letter shows the position of bromine in the periodic table?



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29. An atom of bromine contains protons, neutrons and electrons.
Which row of the table shows the relative charges on these particles?

	proton	**neutron**	**electron**
A	+1	–1	0
B	+1	0	–1
C	–1	0	+1
D	+1	+1	0

30. Which of the following statements about the halogens are correct?

1 their reactivity decreases as their atomic numbers increase
2 their boiling points increase as their atomic numbers increase

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

31. Which row of the table correctly describes bromine, chlorine and iodine at room temperature?

	bromine	**chlorine**	**iodine**
A	red-brown liquid	yellow-green gas	purple gas
B	yellow-green gas	red-brown liquid	grey solid
C	red-brown liquid	yellow-green gas	grey solid
D	red-brown gas	yellow-green liquid	purple gas

32. Halogens were added to solutions of potassium halides.
In which of the following mixtures will the substances **not** react?

A iodine and potassium bromide solution
B chlorine and potassium bromide solution
C bromine and potassium iodide solution
D chlorine and potassium iodide solution

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Group 1 of the periodic table

33. Which of the following statements about group 1 elements are correct?

1 their reactivities increase as their atomic numbers increase
2 all of the elements in group 1 react with cold water

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

34. A compound of sodium has the formula $Na_2S_2O_3$.
The most likely name for this compound is

A sodium thiosulphate
B sodium sulphur oxide
C sodium sulphide
D sodium sulphioxade

35. Potassium reacts with water.
The balanced equation for this reaction is

A $K + H_2O \rightarrow KOH + H$
B $2K + 2H_2O \rightarrow 2KOH + H_2$
C $K + 2H_2O \rightarrow K(OH)_2 + H_2$
D $2K + H_2O \rightarrow K_2OH + H$

36. An atom of sodium contains
11 electrons
12 neutrons
11 protons

Which of these statements is correct?

A the atomic number of sodium is 23
B all group 1 elements have atoms containing 11 electrons
C all atoms of sodium contain 11 protons
D the atomic number of sodium is 12

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37. A teacher was attempting to make potassium chloride.
He had available potassium, potassium hydroxide solution and potassium carbonate solution.
Which of these could he safely add to dilute hydrochloric acid to produce a solution of potassium chloride?

A potassium and potassium carbonate solution only
B potassium hydroxide solution and potassium carbonate solution only
C potassium carbonate solution only
D potassium hydroxide solution only

Ammonia

38. Ammonia gas can be collected by upward delivery. It cannot be collected over water.
Which row of the table shows the properties of ammonia suggested by this information?

	density compared to air	**solubility in water**
A	denser	soluble
B	less dense	insoluble
C	denser	insoluble
D	less dense	soluble

39. Ammonia reacts with sulphuric acid to form ammonium sulphate.
The equation for this reaction is

A $NH_3 + H_2SO_4 \rightarrow NH_5SO_4$
B $NH_3 + H_2SO_4 \rightarrow NH_3SO_4 + H_2$
C $2NH_3 + H_2SO_4 \rightarrow (NH_4)_2SO_4$
D $2NH_3 + H_2SO_4 \rightarrow 2NH_4SO_4 + H_2$

40. Which of the following statements about ammonia are correct?

1 ammonia is used in the manufacture of nitric acid
2 ammonia turns moist blue litmus paper red

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

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Additional Science (2103)
Biology (2105)
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Science 5007 / Chemistry 5035 (C1a)

Unit C1a - 5007/5035	
Topics 5 & 6	
1	D
2	D
3	A
4	A
5	B
6	D
7	B
8	A
9	C
10	C
11	B
12	C
13	C
14	D
15	B
16	D

Unit C1a - 5007/5035	
Topics 5 & 6	
17	C
18	D
19	A
20	C
21	B
22	C
23	D
24	B

Unit C1a - 5007/5035	
Topics 5 & 6	
25	D
26	C
27	B
28	B
29	B
30	C
31	C
32	A
33	C
34	A
35	B
36	C
37	B
38	D
39	C
40	A

Science 5008 / Chemistry 5036 (C1b)

Unit C1b - 5008/5036	
Topics 7 & 8	
1	A
2	C
3	D
4	A
5	D
6	A
7	B
8	C
9	B
10	B
11	A
12	B
13	B
14	D
15	B
16	D

Unit C1b - 5008/5036	
Topics 7 & 8	
17	B
18	C
19	D
20	D
21	C
22	A
23	D
24	C

Unit C1b - 5008/5036	
Topics 7 & 8	
25	B
26	C
27	A
28	C
29	D
30	A
31	C
32	D
33	D
34	C
35	D
36	C
37	C
38	C
39	A
40	C

Surname	Initial(s)
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Paper Reference(s)

5007 5035

Edexcel GCSE

Science (5007)

Chemistry (5035)

C1a – Topics 5 and 6

Foundation and Higher Tiers

Friday 6 March 2009 – Morning

Time: 20 minutes

Materials required for examination
Multiple Choice Answer Sheet
HB pencil, eraser and calculator

Items included with question papers
Nil

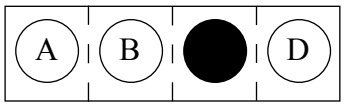
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Foundation tier candidates: answer questions 1 – 24.
Higher tier candidates: answer questions 17 – 40.
All candidates are to answer questions 17 – 24.

Before the test begins:
Check that the answer sheet is for the correct test and that it contains your candidate details.

How to answer the test:
For each question, choose the right answer, A, B, C or D and mark it in HB pencil on the answer sheet.
For example, the answer C would be marked as shown.



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Do any necessary calculations and rough work in this booklet. You may use a calculator if you wish.

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Higher tier candidates start at question 17.

Group 1 elements

The table shows some information about three group 1 elements.

name	symbol of atom	relative speed of reaction with cold water
lithium	Li	slow
sodium	Na	
potassium		very fast

1. The symbol for an atom of potassium is

A K
B P
C Po
D Ko

2. The group 1 elements are also known as the

A halogens
B noble gases
C transition metals
D alkali metals

3. The relative speed of the reaction of sodium with cold water is

A very slow
B fast
C slow
D explosive

4. All of the elements in group 1

A have similar chemical properties
B are non-metals
C have identical physical properties
D only react with water

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Carbon dioxide

5. The formula of carbon dioxide is

A CO^2
B CO
C CO_2
D Co_2

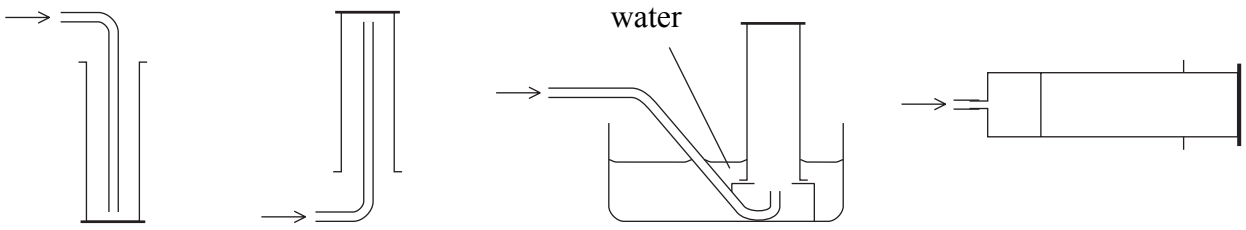
6. Carbon dioxide can be prepared by adding dilute hydrochloric acid to calcium carbonate. In this reaction the hydrochloric acid is

A precipitated
B neutralised
C hydrated
D dehydrated

7. The test to prove that a gas is carbon dioxide is to bubble the gas through

A limewater
B caustic soda
C water
D universal indicator

8. Carbon dioxide is denser than air and only slightly soluble in water.
Which of these methods would **not** be suitable to collect a sample of carbon dioxide?



A **B** **C** **D**

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9. Carbon dioxide is used in fire extinguishers.
Which row of the table shows the properties of carbon dioxide that make it suitable for that use?

	carbon dioxide supports combustion	**carbon dioxide prevents oxygen reaching the fire**
A	no	no
B	no	yes
C	yes	no
D	yes	yes

10. Carbon dioxide and iron are obtained when iron(III) oxide is heated with carbon monoxide.
The word equation for this reaction is

iron(III) oxide + carbon monoxide → iron + carbon dioxide

This conversion of iron(III) oxide into iron is

A precipitation
B combustion
C neutralisation
D reduction

11. Carbon monoxide can be used to convert iron(III) oxide into iron but is not used to convert aluminium oxide into aluminium.
This shows that aluminium

A has a greater density than iron
B has the same reactivity as iron
C is more reactive than iron
D is an inert metal

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Investigating solids

12. When baking powder is dissolved in water, the temperature of the solution decreases.
This process is

A a precipitation
B endothermic
C a displacement
D exothermic

13. Baking powder is used in cooking.
When any mixture of substances is cooked

A a physical change occurs
B the starting substances are not changed after cooking
C baking powder is always involved
D a chemical change occurs

14. In a flame test, one of the compounds in baking powder produced a yellow flame.
This shows that baking powder contains a compound of

A potassium
B magnesium
C sodium
D calcium

15. Concentrated sulphuric acid was added to sugar, $C_{12}H_{22}O_{11}$.
A black solid carbon, C, was formed.

$$C_{12}H_{22}O_{11} = 12C + 11H_2O$$

This reaction is an example of

A combustion
B neutralisation
C dehydration
D oxidation

16. Sodium hydroxide solution is added to a solution of another solid, **X**.
A blue precipitate is formed.
This shows that **X** is a compound of

A iron
B zinc
C sodium
D copper

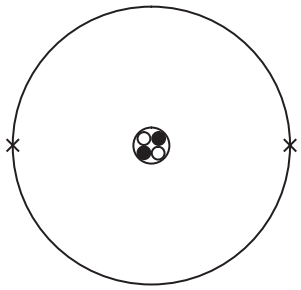
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Higher tier candidates start at question 17 and answer questions 17 to 40.
Questions 17 to 24 must be answered by all candidates: Foundation tier and Higher tier.

Non-metallic elements

Helium, hydrogen and neon are non-metallic elements.

The particles in an atom of helium are shown.



The atomic number of helium is 2.

17. Which statement correctly describes the particles in an atom of helium?

A there are 4 electrons present
B neutrons and protons are present in the nucleus
C protons are positively charged and electrons have no charge
D neutrons are negatively charged

18. Different atoms of helium

A must all contain 2 protons
B can contain different numbers of protons
C can have different atomic numbers
D can contain different numbers of electrons

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19. The table shows information about helium, hydrogen and air.

	boiling point (°C)	**density (g cm^{-3})**
helium	–269	0.00018
hydrogen	–253	0.00009
air	–194	0.00125

Use this information to choose which row of the table below shows the state of hydrogen and helium under room conditions and a possible use of these two elements?

	state of hydrogen and helium	**possible use of hydrogen and helium**
A	liquid	in fire extinguishers
B	gas	in fire extinguishers
C	liquid	in balloons
D	gas	in balloons

20. Helium and neon are in group 0 of the periodic table.
Which of these statements is correct?

A helium is unreactive and neon is reactive
B group 0 elements are more reactive than group 7 elements
C helium and neon are unreactive
D helium is reactive and neon is unreactive

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Salts

Magnesium sulphate is a soluble salt.
Sulphuric acid is used to make magnesium sulphate by reacting it with magnesium oxide.

21. To produce pure magnesium sulphate by this method, all of the sulphuric acid must be reacted.
To react all of the sulphuric acid it is necessary to use

A excess magnesium oxide
B dilute sulphuric acid
C heat
D concentrated sulphuric acid

22. This reaction used to make magnesium sulphate is an example of

A dehydration
B precipitation
C neutralisation
D hydration

23. Lead sulphate is an insoluble salt.
Lead sulphate is prepared in a reaction that forms the salt as a precipitate.
A suitable method of preparing the salt as a precipitate would be to

A add excess lead oxide to dilute sulphuric acid
B add excess lead to dilute sulphuric acid
C mix solutions of sodium sulphate and lead nitrate
D add excess lead carbonate to dilute sulphuric acid

24. The lead sulphate precipitate is formed mixed in a solution.
A pure, dry sample of the insoluble lead sulphate can be obtained from this mixture by

A filtering, evaporating and drying
B crystallisation
C filtering, washing and drying
D evaporating and drying

TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS

Foundation tier candidates do not answer any more questions after question 24.

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Questions 25 to 40 must be answered by Higher tier candidates only.
Foundation tier candidates do not answer questions 25 to 40.

Group 7 elements – the halogens

The halogens are reactive elements.

The table shows some information about the first three group 7 elements.

halogen	atomic number	appearance at room conditions
fluorine		yellow gas
chlorine	17	green-yellow gas
bromine	35	

25. Which of these correctly completes the table?

	atomic number	appearance
A	9	green gas
B	9	red liquid
C	26	green gas
D	26	red liquid

26. Halogens can react with solutions of other halides.
Which of these pairs will react?

A chlorine and potassium bromide solution
B bromine and potassium fluoride solution
C chlorine and potassium fluoride solution
D bromine and potassium chloride solution

27. Which row of the table shows the test for chlorine?

	test with	result
A	a lighted splint	extinguished
B	moist litmus paper	turns white
C	a glowing splint	extinguished
D	moist litmus paper	turns blue

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28. A cylinder of chlorine gas is labelled with these two hazard symbols.



symbol 1



symbol 2

Which row of the table is correct?

	symbol 1 shows that chlorine is	**symbol 2 shows that chlorine is**
A	irritating	corrosive
B	corrosive	harmful
C	poisonous	harmful
D	irritating	poisonous

Food chemistry

Three causes of concern with regard to food safety are

- additives
- preservatives
- pesticides

29. It is suspected that a solid food additive may be contaminated with a copper compound. Which row of the table shows a test on the solid and a test on its solution that can be used to show that it contains a copper compound?

	test on solid	**test on solution of solid**
A	lighted splint	add dilute sulphuric acid
B	flame test	add dilute sulphuric acid
C	lighted splint	add sodium hydroxide solution
D	flame test	add sodium hydroxide solution

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30. Sodium ethanoate is used to flavour some foods.
Which of these substances could not be used to prepare sodium ethanoate from dilute ethanoic acid?

A sodium oxide
B sodium nitrate
C sodium carbonate
D sodium hydroxide

Use the following information to answer questions 31 and 32.

Baking powder contains sodium hydrogencarbonate.

31. Baking powder is often part of cake mixtures and reacts during the cooking process to produce a gas.

Which row of the table shows the type of substance that reacts with the sodium hydrogencarbonate and the name of the gas produced?

	type of substance reacting with sodium hydrogencarbonate	**gas produced**
A	an acid	oxygen
B	an alkali	carbon dioxide
C	an acid	carbon dioxide
D	an alkali	oxygen

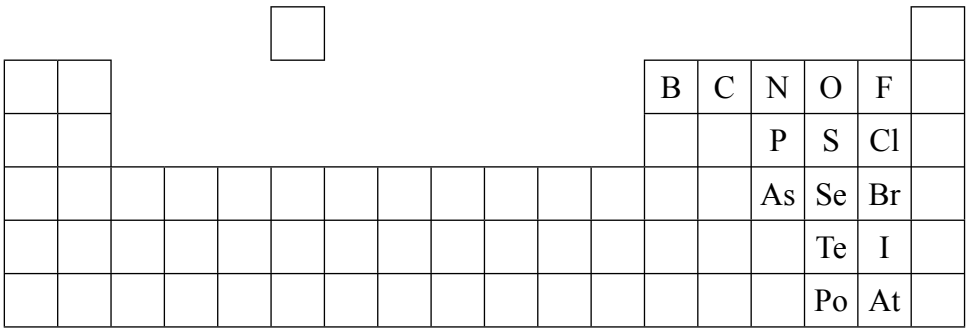
32. Which equation shows the thermal decomposition of sodium hydrogencarbonate?

A $Na_2CO_3 \rightarrow Na_2O + CO_2$
B $2NaHCO_3 \rightarrow Na_2CO_3 + H_2O + CO_2$
C $2NaHCO_3 \rightarrow Na_2O + H_2O + 2CO_2$
D $Na_2CO_3 + H_2O + CO_2 \rightarrow 2NaHCO_3$

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Periodic table

The atomic symbols of some elements in the periodic table are shown.



Use this periodic table to answer questions 33 to 36.

33. Here are three statements about the positions of the elements.
The elements with the atomic symbols

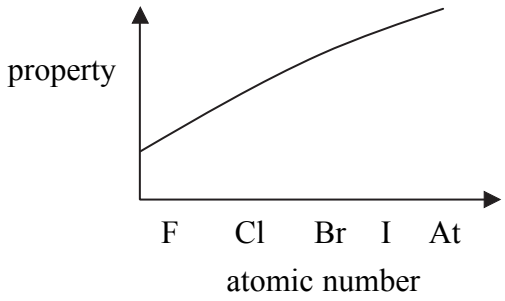
1 S and Te are in the same group
2 B and N are in the same group
3 Po and I are in different periods

Which of these statements is correct?

A 1 only
B 3 only
C 1 and 2 only
D 1 and 3 only

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34. The diagram shows the trend in a property of the elements from fluorine, F, to astatine, At, with increasing atomic number.



The property could be

A the number of atoms in one molecule of the halogen
B boiling point
C number of electrons in the outer shell
D reactivity

35. The table shows the atomic numbers and relative atomic masses of tellurium, Te, and iodine, I.

element	atomic number	relative atomic mass
tellurium	52	127.6
iodine	53	126.9

Which of these statements is correct?

A a tellurium atom contains more protons than an iodine atom
B an atom of tellurium has the same number of electrons as an atom of iodine
C tellurium and iodine have different chemical properties
D tellurium and iodine are arranged in the periodic table in order of increasing relative atomic mass

36. A compound of selenium, Se, has the formula, Na_2SeO_4.
The most likely name of this compound is

A sodium selenium oxide
B sodium selenide
C sodium selenate
D sodium oxyselenide

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Lead

Lead is obtained from the ore galena.
Galena is heated strongly to form lead oxide.
Lead can be extracted by heating a mixture of lead oxide and carbon.
The carbon reacts to form carbon monoxide and this reacts with the lead oxide to form lead.

37. Which is the correct equation for the reaction of lead oxide with carbon monoxide?

A $PbO + CO \rightarrow C + PbO_2$
B $2PbO + 3CO \rightarrow 3CO_2 + 2Pb$
C $PbO + CO \rightarrow CO_2 + Pb$
D $2PbO + CO \rightarrow CO_2 + 2Pb$

38. Which row of the table describes the types of changes which the original carbon, the carbon monoxide and the lead oxide undergo in this reaction?

	carbon is	**carbon monoxide is**	**lead oxide is**
A	reduced	reduced	oxidised
B	oxidised	reduced	oxidised
C	reduced	oxidised	reduced
D	oxidised	oxidised	reduced

39. Sodium is more reactive than lead.
Here are three methods used to extract metals from their ores.

1 reduction with carbon
2 reaction with carbon monoxide
3 electrolysis

Which of these methods can be used to extract sodium from its ore?

A 1 only
B 2 only
C 3 only
D none of these

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40. Titanium is extracted by reacting titanium(IV) chloride with sodium.
Titanium cannot be extracted by heating titanium(IV) oxide with carbon.
Gold is found uncombined in the Earth's crust.
The order of reactivity of titanium, gold, and lead is

	most reactive		least reactive
A	lead	titanium	gold
B	titanium	lead	gold
C	titanium	gold	lead
D	gold	lead	titanium

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5007 / 5035 (C1a)

Unit C1a – 5007/5035	
Topics 5 & 6	
1	A
2	D
3	B
4	A
5	C
6	B
7	A
8	B
9	B
10	D
11	C
12	B
13	D
14	C
15	C
16	D

Unit C1a – 5007/5035	
Topics 5 & 6	
17	B
18	A
19	D
20	C
21	A
22	C
23	C
24	C

Unit C1a – 5007/5035	
Topics 5 & 6	
25	B
26	A
27	B
28	C
29	D
30	B
31	C
32	B
33	D
34	B
35	C
36	C
37	C
38	D
39	C
40	B

5008 / 5036 (C1b)

Unit C1b – 5008/5036	
Topics 7 & 8	
1	D
2	B
3	C
4	C
5	B
6	C
7	B
8	D
9	C
10	A
11	C
12	A
13	D
14	B
15	D
16	D

Unit C1b – 5008/5036	
Topics 7 & 8	
17	C
18	A
19	C
20	C
21	D
22	D
23	C
24	B

Unit C1b – 5008/5036	
Topics 7 & 8	
25	A
26	C
27	C
28	D
29	A
30	B
31	B
32	D
33	C
34	D
35	D
36	B
37	C
38	D
39	B
40	D