

Surname	Initial(s)
Signature	

Paper Reference(s)

5007 5035
Edexcel GCSE

Science (5007)

Chemistry (5035)

C1a – Topics 5 and 6

Foundation and Higher Tier

Thursday 22 November 2007 – 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.

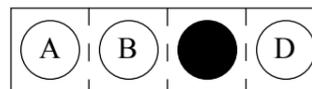
Before the test begins:

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.

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

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Turn over

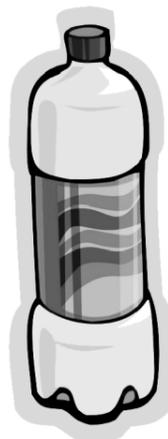
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**Questions 1 to 16 must be answered by Foundation tier candidates only.
Higher tier candidates start at question 17.**

Lemonade

The ingredients in lemonade are

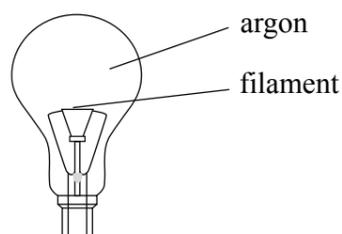
artificial sweetener, formula $C_6H_{12}O_3Cl_3$
ascorbic acid
carbon dioxide
citric acid
water



1. The fizz in the lemonade is caused by
 - A citric acid
 - B carbon dioxide
 - C ascorbic acid
 - D oxygen
2. An artificial sweetener is
 - A sugar
 - B obtained from plants
 - C man-made
 - D tasteless
3. The artificial sweetener in the lemonade contains atoms of
 - A calcium
 - B chlorine
 - C fluorine
 - D water
4. Citric acid is added to the lemonade to improve the
 - A appearance
 - B colour
 - C smell
 - D taste

Lights

Electrical wiring connects lights in the home.



5. Argon is the gas used in filament light bulbs because it is

- A reactive
- B colourful
- C inert
- D a conductor of electricity

6. Which row of the table shows the properties of a substance used to make the filament?

material	metal or non-metal	conductor of electricity
A	non-metal	poor
B	metal	poor
C	non-metal	good
D	metal	good

7. Some of the copper wire was reacted with dilute nitric acid to form a solution. Sodium hydroxide solution was added to the solution made from the wire. The colour of the precipitate formed was

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

8. Which of the following could be used to show the presence of copper in a copper compound?

- A a lighted splint
- B limewater
- C a flame test
- D indicator paper

Periodic table

Use the periodic table below to answer questions 9 to 12.

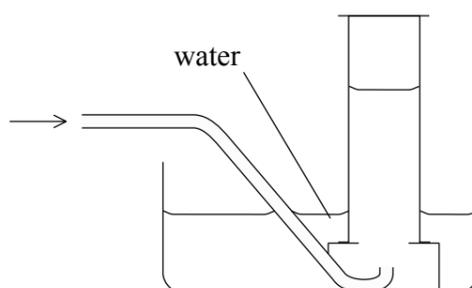
The letters L, M, R, S and T show the positions of elements in the periodic table. They are not the symbols of the elements.

1	2											3	4	5	6	7	0	
		□																
	L																	
															R	S		
						M												
																T		

9. Two elements in the same group are
- A M and R
 - B R and S
 - C L and M
 - D S and T
10. The two elements which are both metals are
- A R and S
 - B L and M
 - C S and T
 - D M and S
11. The transition element shown is element
- A L
 - B M
 - C R
 - D S
12. The periodic table lists elements in order of increasing atomic numbers. The element with the atomic number of 12 is
- A L
 - B M
 - C R
 - D S

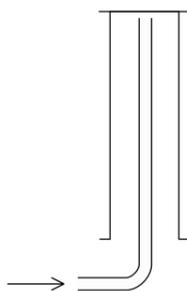
Hydrogen gas

A sample of hydrogen gas was collected using the apparatus below.



13. This method of collection is
- A upward delivery
 - B over water
 - C downward delivery
 - D only used to collect hydrogen

14. Hydrogen can also be collected using this apparatus.



Which row of the table shows the properties of hydrogen?

	density compared to air	solubility in water
A	less dense	very soluble
B	more dense	insoluble
C	less dense	insoluble
D	more dense	very soluble

15. A test for hydrogen is that it
- A relights a glowing splint
 - B pops with a glowing splint
 - C extinguishes a lighted splint
 - D pops with a lighted splint

16.



This hazard label on a cylinder of hydrogen gas shows that the gas is

- A** poisonous
- B** harmful
- C** flammable
- D** corrosive

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.

Firework display



Roman candles, a type of firework, contain magnesium, potassium nitrate and other compounds to colour the flame.

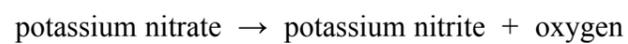
17. A yellow flame colour is most likely to be caused by compounds containing

- A potassium
- B magnesium
- C sodium
- D lithium

18. The magnesium burns in air to form a white ash.
Which row of the table correctly identifies the ash and the chemical change the magnesium undergoes?

	white ash	chemical change
A	magnesium nitrate	oxidation
B	magnesium oxide	reduction
C	magnesium nitrate	reduction
D	magnesium oxide	oxidation

19. The word equation for the action of heat on the potassium nitrate in the firework is



This change is

- A** thermal decomposition
B hydration
C neutralisation
D dehydration
20. Potassium nitrate can be prepared by reacting dilute nitric acid with potassium carbonate. Which row of the table correctly describes potassium nitrate and the type of reaction?

	potassium nitrate is a	type of reaction
A	base	neutralisation
B	salt	neutralisation
C	base	dehydration
D	salt	dehydration

Group 1: the alkali metals

The table gives information about three group 1 metals.

name of metal	atomic symbol	atomic number
lithium	Li	3
sodium	Na	11
potassium	K	19

21. The nucleus of an atom of lithium consists of
- A** electrons and protons
B protons only
C neutrons and protons
D neutrons only

22. All atoms of sodium must contain the same number of
- A protons
 - B neutrons
 - C electrons as in a lithium atom
 - D electrons as in a potassium atom
23. When potassium reacts with water it melts and produces a lilac flame.
The reaction of potassium with water is
- A a neutralisation
 - B exothermic
 - C a thermal decomposition
 - D endothermic
24. The reactivity of the alkali metals with water
- A decreases as the atomic number increases
 - B is the same for all these metals
 - C increases as the atomic number increases
 - D is less than the reactivity of all other metals

TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS

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

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

Christmas lights

When the electricity was switched on the lights did not work.



(Source: www.wikipedia.org)

An investigator examined the lights, wires and support poles.

25. The filament light bulbs contain a gas.
Which row of the table shows the most likely description of the gas in these light bulbs?

	colour of gas	reactivity of gas
A	green	very reactive
B	colourless	unreactive
C	green	unreactive
D	colourless	very reactive

26. The properties of four elements are listed in the table.
Which element is most likely to be used to make the electrical wires?

element	metal or non-metal	conductivity	melting point (°C)
A	metal	good	1073
B	non-metal	poor	3550
C	metal	good	98
D	non-metal	poor	120

27. A piece of the electrical wire was dipped in concentrated hydrochloric acid and then placed in a Bunsen flame.
A blue-green colour showed that the wire contained
- A sodium
 - B copper
 - C potassium
 - D barium
28. A sample of metal from a support pole was reacted with dilute sulphuric acid to form a solution.
Sodium hydroxide solution was added to this solution.
A pale green precipitate showed that the support pole contained
- A copper
 - B zinc
 - C magnesium
 - D iron

Effervescent health salts



Health salts contain sodium hydrogencarbonate and citric acid.
When health salts are added to water, carbon dioxide is given off.

29. The results of three tests which can be carried out on a gas are
- 1 extinguishes a lighted splint
 - 2 turns limewater milky
 - 3 shows a pH of 8 with universal indicator solution

Which of these results would carbon dioxide give?

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

30. The formula for sodium hydrogencarbonate is

- A NaH_2CO_3
- B Na_2HCO_3
- C $\text{Na}(\text{HCO}_3)_2$
- D NaHCO_3

31. Sodium hydrogencarbonate will also produce carbon dioxide when it is

- A added to sodium hydroxide solution
- B heated
- C oxidised
- D reduced

32. Which row of the table shows a correct use of carbon dioxide and a correct use of citric acid?

	use of carbon dioxide	use of citric acid
A	as dry ice	as vinegar
B	in fire extinguishers	in fertilisers
C	as dry ice	as food flavouring
D	in fertilisers	in fire extinguishers

Ores

Metals are extracted from ores.
Metal ores are often oxides.
Rutile is an ore of titanium.
Titanium is of similar reactivity to aluminium.

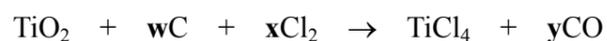
37. Iron can be obtained from iron(III) oxide.
Three mixtures containing iron(III) oxide were heated.

- 1 carbon and iron(III) oxide
- 2 copper and iron(III) oxide
- 3 magnesium and iron(III) oxide

Iron would be formed in mixture

- A 1 only
 - B 2 only
 - C 1 and 3 only
 - D 1, 2 and 3
38. Calcium is a more reactive metal than aluminium.
Calcium can be extracted from its ore by
- A electrolysis
 - B reduction with carbon
 - C heating with aluminium
 - D reaction with carbon monoxide

39. The titanium ore, rutile, is heated with carbon and chlorine to produce titanium(IV) chloride.
The equation for the reaction of titanium(IV) oxide with carbon and chlorine can be represented by



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

	w	x	y
A	2	2	2
B	2	1	2
C	2	2	1
D	1	2	2

- 40.** To extract the titanium, titanium(IV) chloride is heated with magnesium in an atmosphere of argon.
Which row of the table shows the reasons for using magnesium and argon in this process?

	magnesium is	argon is
A	very reactive	unreactive
B	very reactive	reactive
C	unreactive	unreactive
D	unreactive	reactive

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

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