Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
2013–2014

Science: Single Award

Unit 2 (Chemistry)

Foundation Tier

[GSS21]

GSS21

THURSDAY 15 MAY 2014, MORNING

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all eleven** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 60.
Quality of written communication will be assessed in Question **10(a)**.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
A Data Leaflet, which includes a Periodic Table of the Elements, is included in this question paper.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
Total Marks	

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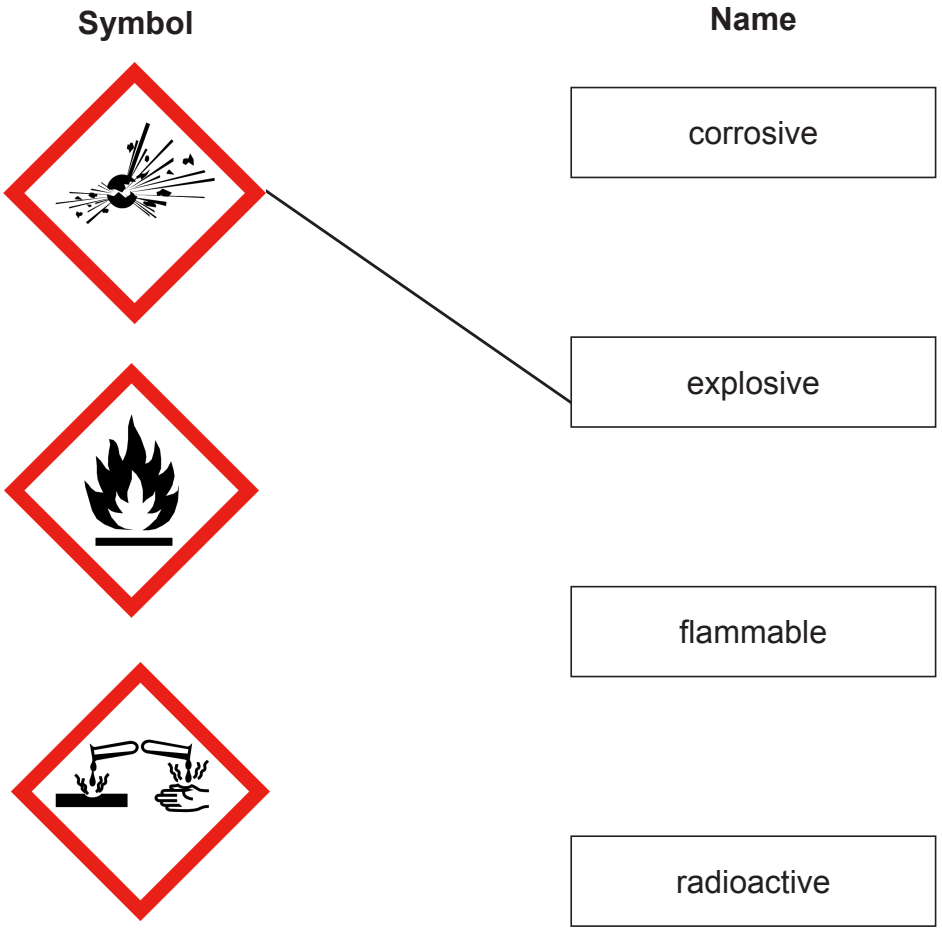
Examiner Only	
Marks	Remark

1 Given below are some hazard symbols and their names.

(a) Using lines, match each symbol to its name.
One has been done for you.



[2]

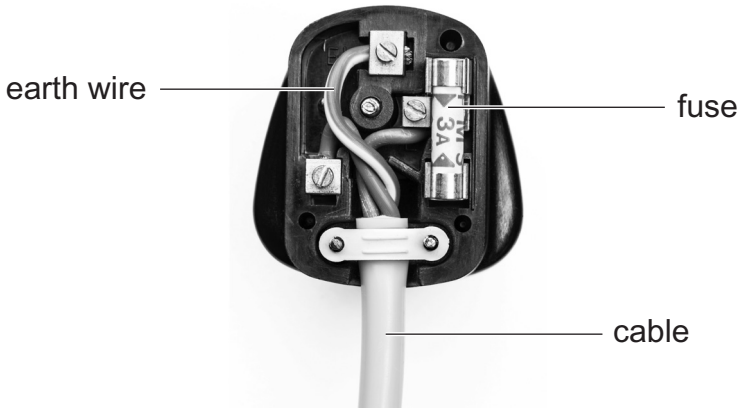
(b) What is the danger of a toxic substance?

_____

_____ [1]

Examiner Only	
Marks	Remark

2 Shown below is a picture of a plug from a lamp.



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(a) Complete the sentences below about the materials used.

Choose from:

conductor **insulator** **plastic** **glass**

The wires in a plug are made from copper because it is a good _____ of electricity.

The cable to the plug is covered by the material _____. [2]

A fuse is used to make the lamp safe. The metal wire in the fuse must melt if there is too much electricity.

Below is some information about metals which may be used.

Metal	Melting point/°C	Cost per gram/£
Platinum	1768	26.28
Tungsten	3422	3.41
Lead	327	0.98
Copper alloy	398	3.34

(b) The wire must melt if the temperature reaches 330 °C.
Which metal should the fuse wire be made from? Explain your answer.

_____

_____

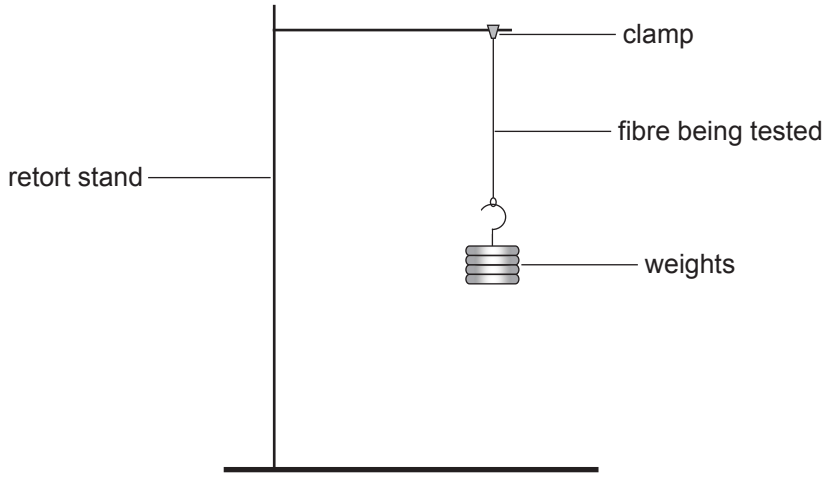
_____ [2]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

3 A student carried out an investigation to test the strength of five different fibres. The apparatus he used is shown below.



(a) The maximum weight each fibre could hold before breaking was measured and recorded below.

Fibre	Maximum weight/N
Nylon	20
Linen	11
Silk	8
Lycra	25
Cotton	10

(i) Name the fibre which is strongest.

_____ [1]

(ii) Name the **two** synthetic (not natural) fibres that were tested.

_____ and _____ [1]

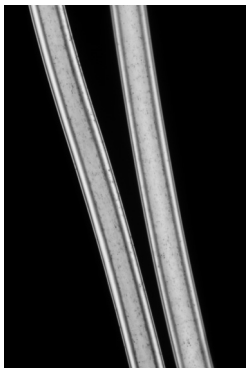
(b) Using the information and your knowledge, suggest **two** reasons why synthetic fibres are replacing natural fibres for clothing.

1. _____

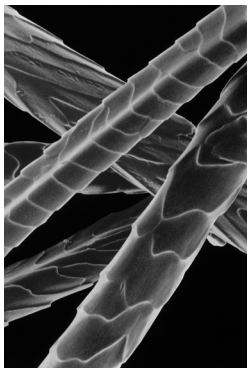
2. _____ [2]

4 Below are images of different fibres as seen under a microscope.

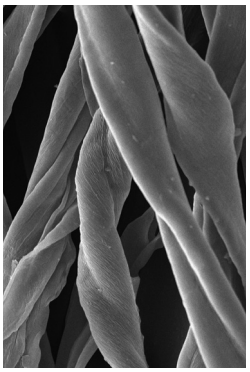
Examiner Only	
Marks	Remark



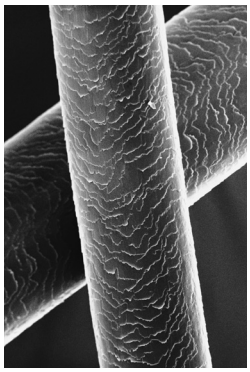
nylon



wool

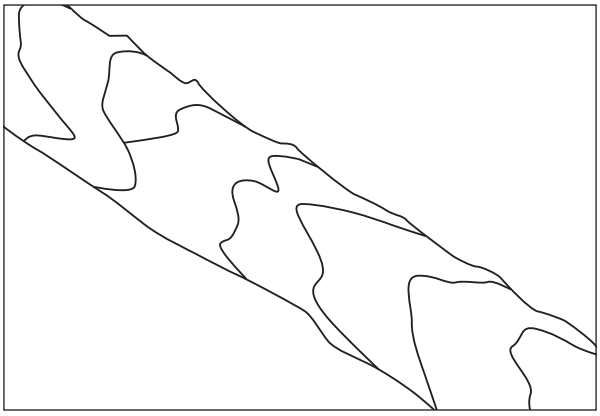


cotton



hair

A scientist collected the fibre below from a crime scene.



(a) Using the images above, identify the fibre from the crime scene.

_____ [1]

(b) Scientists can also collect fingerprint evidence from a crime scene.

(i) Suggest **one** reason why fingerprints usually provide better evidence than fibres.

_____

_____ [1]

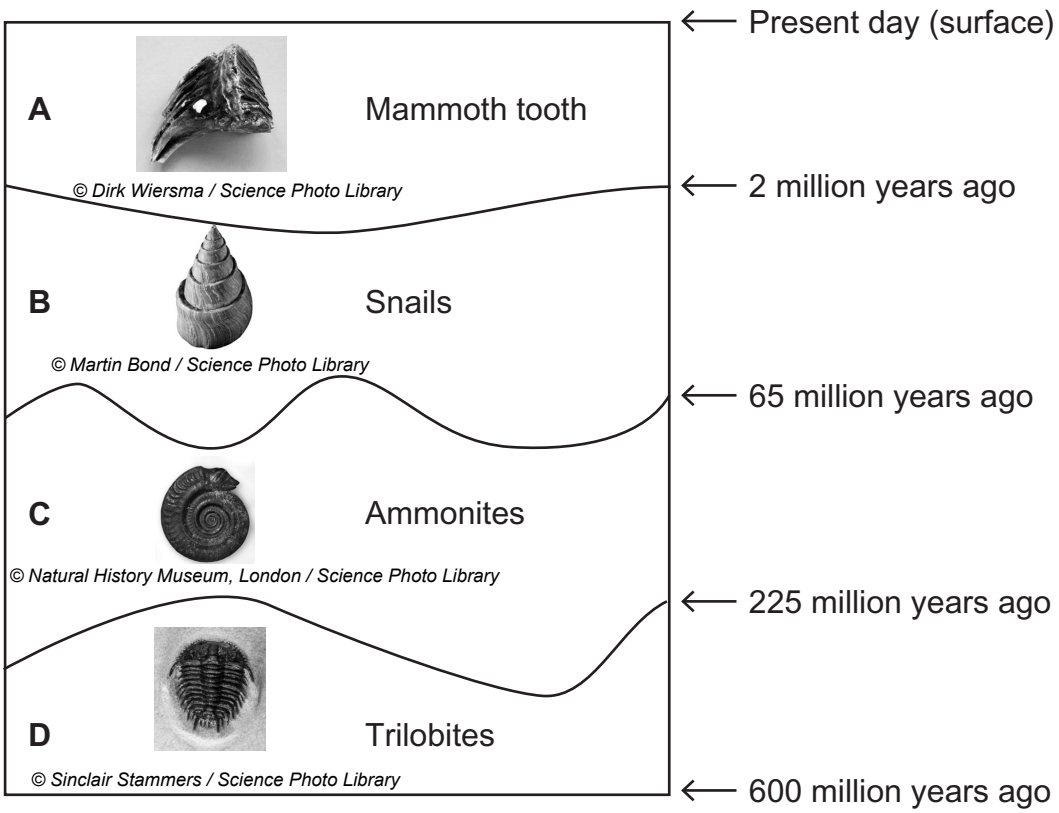
(ii) Whorl and composite are two types of fingerprint. Name the other **two** main types.

1. _____

2. _____ [2]

Examiner Only	
Marks	Remark

5 Fossils are often found in rocks. Layers of rock of a similar age contain similar types of fossils. The diagram below gives the age of some layers of rock and the fossils found in them.



(a) Which layer of rock, **A**, **B**, **C** or **D** is the oldest?

_____ [1]

(b) A scientist found fossils of ammonites in a rock. What does this tell him about the age of this rock?

_____

_____ [1]

(c) Some trilobite fossils were found in rock on the surface of the Earth. Suggest why this rock is now on the surface.

_____

_____ [1]

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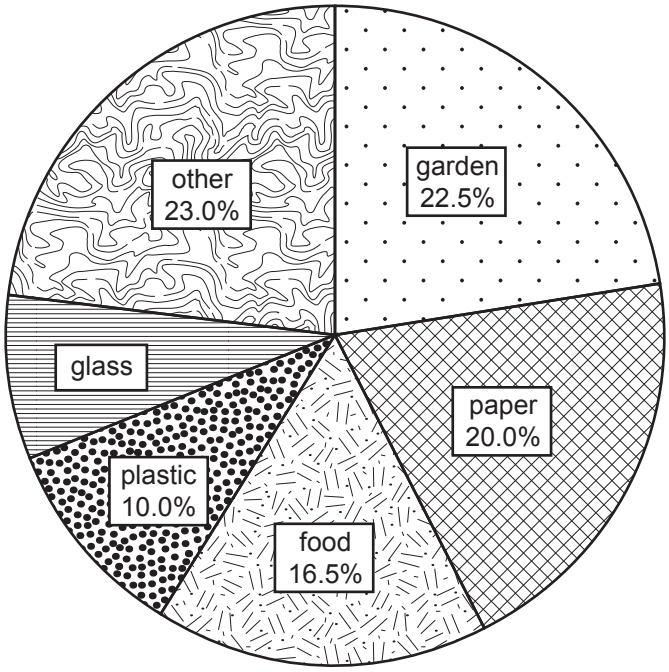
(Questions continue overleaf)

Examiner Only	
Marks	Remark

6 The pie chart below gives information about the composition of waste in a household bin.



(a) Calculate the percentage of waste which is glass.

(Show your working out.)

_____ % [2]

(b) The Government is trying to encourage householders to cut down on waste by using the advertising campaign '*reduce, reuse and recycle*'. Using lines, match the following examples to the correct word.

Example	Word
	reduce
use plastic bags more than once	
	reuse
use products with less packaging	
	recycle

[2]

(c) Glass is often recycled. Describe the steps in recycling waste glass after it has been delivered to the factory.

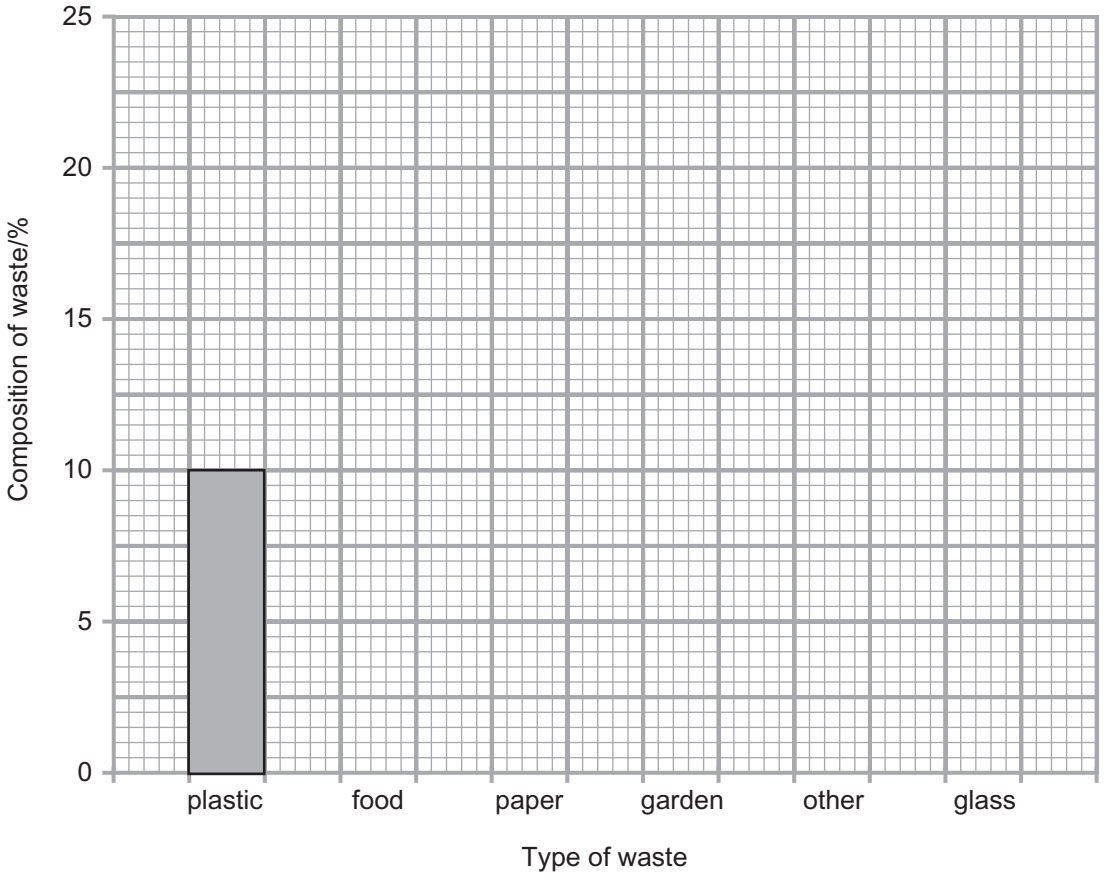
_____

_____

_____

_____ [3]

(d) Use the information opposite to complete the bar chart below.



[2]

(e) Give **two** ways local authorities and councils are encouraging recycling.

1. _____

_____

2. _____

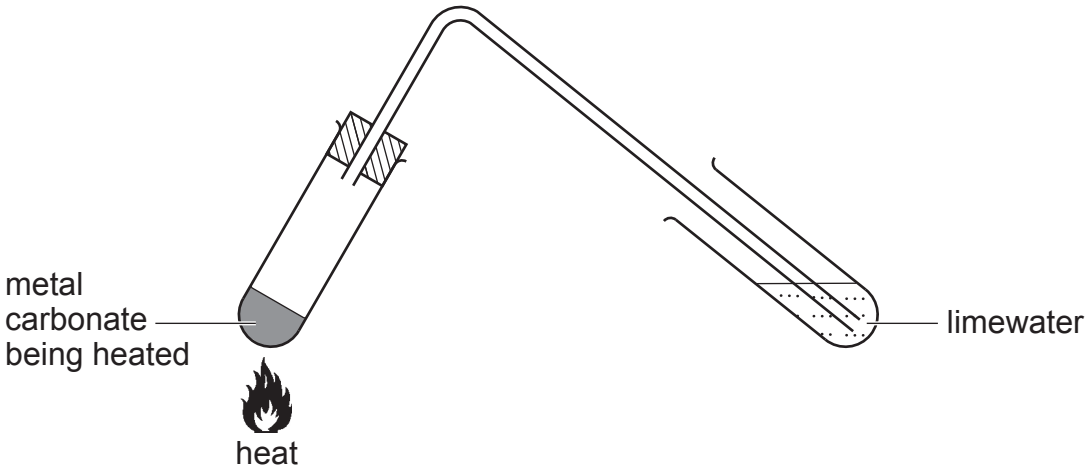
_____ [2]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

7 A student investigated the effect of heat on different metal carbonates.
The diagram below shows the apparatus she used.



After two minutes she stops heating the test tube and allows it to cool before measuring the mass of the metal carbonate.
The results are shown below.

Chemical	Mass before heating/g	Mass after heating/g	Colour before heating	Colour after heating	Effect on limewater
copper carbonate	2.4	2.0	green	black	turns cloudy
manganese carbonate	2.6	2.1	pink	black	turns cloudy
sodium carbonate	2.5	2.5	white	white	none
zinc carbonate	2.7	2.1	white	white	turns cloudy

Examiner Only	
Marks	Remark

(a) Name a piece of apparatus that could be used to measure the mass of the metal carbonates.

_____ [1]

(b) Suggest why there is a loss in mass when copper carbonate is heated.

_____

_____ [1]

(c) Name the metal carbonate that lost the most mass during this investigation.

_____ [1]

(d) Which metal carbonate did **not** decompose when heated?
Fully explain your answer.

_____

_____

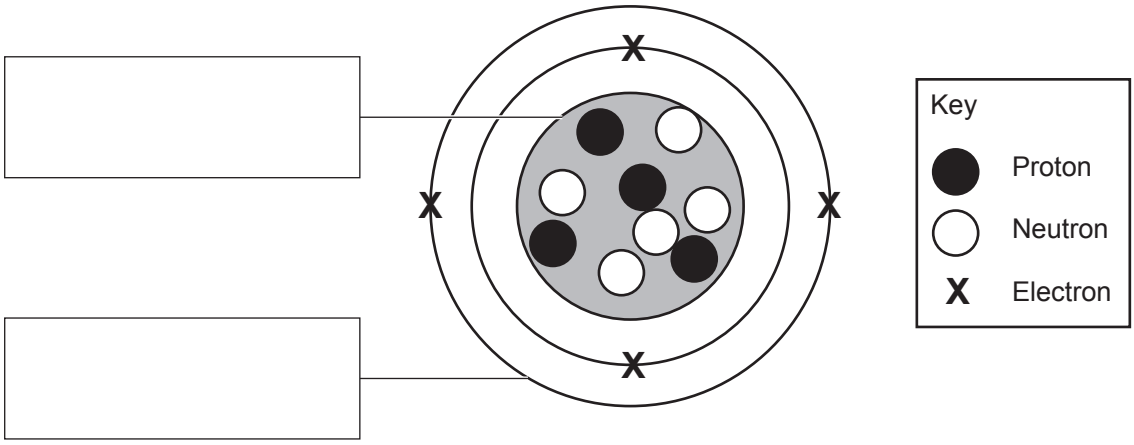
_____

_____

_____ [3]

Examiner Only	
Marks	Remark

8 The diagram below shows an atom of an element.



(a) Complete the diagram above by adding labels to the two boxes. [2]

(b) What is the **atomic number** of this element?

_____ [1]

(c) What is meant by the term **mass number**?

_____

_____ [1]

(d) To which group of the Periodic Table does this element belong? Explain your answer in terms of its electronic structure.

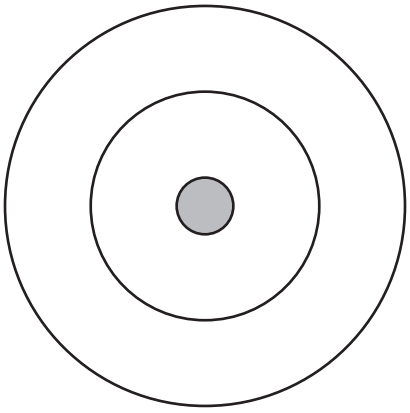
_____

_____ [2]

Examiner Only

Marks	Remark

(e) Oxygen has eight electrons. Complete the diagram below to show the electronic structure of oxygen.



[1]

(f) **(i)** Name the compound formed in the reaction between magnesium and oxygen.

_____ [1]

(ii) What is the name given to this type of reaction?

_____ [1]

Examiner Only

Marks	Remark

9 The table below shows the percentage of the most common elements found in the igneous rocks in the Earth's crust.

Element	Percentage
Aluminium	8.1
Calcium	3.6
Iron	5.0
Magnesium	2.1
Oxygen	47.0
Phosphorus	0.1
Potassium	2.6
Silicon	28.0
Sodium	2.9
Titanium	0.6

Use the information in the table and your knowledge to answer the following questions.
You may find your Data Leaflet helpful.

(a) Igneous rocks are only one **type** of rock. Name the other two types.

_____ and _____ [2]

(b) Name the most common **metal** in the Earth's crust.

_____ [1]

(c) Calculate the total percentage of alkaline earth metals in the Earth's crust.

_____ % [1]

Examiner Only

Marks	Remark

10 (a) Potassium and sodium are Group 1 metals. Compare their reactivity with water.

Your answer should include:

- two similarities between the reactions
- two differences between the reactions
- the products of one of the reactions

In this question you will be assessed on your written communication skills including the use of specialist scientific terms.

[6]

(b) Francium is another Group 1 metal. Explain fully why it is not used in the school laboratory to demonstrate the reactions of Group 1 metals with water.

[2]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

11 Acid indigestion is caused by excess hydrochloric acid in the stomach. It can be treated using antacid tablets which contain sodium hydrogencarbonate.

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(a) Complete the word equation for the reaction between stomach acid and the antacid tablet.

sodium hydrogencarbonate + hydrochloric acid → [ ] + [ ] + [ ]

[3]

(b) Suggest one reason why antacid tablets do **not** contain sodium hydroxide.

_____

_____ [1]

THIS IS THE END OF THE QUESTION PAPER

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