Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
2011

Science: Double Award (Modular)

Paper 2
Foundation Tier

[G8202]

G8202

FRIDAY 27 MAY, 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 four** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 80.
Quality of written communication will be assessed in question **3(d)**.
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 provided.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
Total Marks	

Examiner Only	
Marks	Remark

1 **(a)** In this question, match each use of the material to a **suitable** physical property. One has been done for you.

Material	Physical Property
 Aluminium saucepan	**conductor of electricity**
 Glass bottle	**low density**
 Plastic bag	**conductor of heat**
 Ceramic oven dish	**transparent**
 Copper wire	**high melting point**

[3]

(b) Chemical substances can be described as either elements, compounds or mixtures.

Classify each of the substances below as an element, compound or mixture by ticking the correct box in the table below. One has been done for you.

substance	element	mixture	compound
rust			✓
magnesium			
copper carbonate			
sea water			
helium			

[4]

(c) All matter is made up of tiny particles. Use the idea of particles to answer the following questions.

(i) Why is it that if someone has burned toast in a kitchen you can smell this throughout the house?

_____

_____

_____ [2]

(ii) If you add salt to warm water and stir the mixture the salt dissolves in the water. What has happened to the salt particles?

_____

_____

_____

_____ [2]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

(d) Fossil fuels give out heat when they burn.

(i) Name **three** different fossil fuels.

_____

_____

_____ [3]

(ii) Complete the word equation below to describe what happens when a fossil fuel burns completely in air or oxygen:

fossil fuel + oxygen → + + energy [2]

(e) The table below gives some information about the structure of atoms. Complete the table.

Symbol	Number of protons	Number of neutrons	Number of electrons	Mass number	Electron arrangement
Na		12	11	23	2,8,1
Ca	20	20	20		2,8,8,2
Al	13		13	27	

[4]

Examiner Only	
Marks	Remark

2 **(a)** Chemical reactions occur at different rates or speeds. Choose from the list below to answer the questions which follow.

A copper metal with dilute hydrochloric acid
B sulphuric acid with sodium hydroxide
C an iron gate with oxygen and water
D marble chips with hydrochloric acid
E testing for hydrogen gas using a lit taper

(i) Which reaction, **A**, **B**, **C**, **D** or **E** is slow and continues for years?

_____ [1]

(ii) Which reaction, **A**, **B**, **C**, **D** or **E** is a steady reaction which takes minutes and produces a gas?

_____ [1]

(iii) Which reaction, **A**, **B**, **C**, **D** or **E** will not happen, even after many years?

_____ [1]

(b) A large piece of zinc will react slowly with dilute sulphuric acid. Give **three** things you could do to speed this reaction up.

1. _____

2. _____

3. _____ [3]

Examiner Only	
Marks	Remark

(c) Calcium carbonate (limestone) can be decomposed to give calcium oxide and carbon dioxide.

(i) How could you make calcium carbonate decompose?

_____ [1]

(ii) When calcium carbonate decomposes how would you tell that the gas produced is carbon dioxide?

_____

_____

_____ [2]

(iii) When calcium carbonate decomposes is the calcium oxide which is formed heavier, lighter or the same mass as the calcium carbonate?

_____ [1]

(d) Two pupils find a piece of a grey solid which they bring into their science classroom. One pupil thinks the solid is a metal. The other thinks it is not. Describe **two** tests that the pupils could do to prove whether or not the solid is a metal. Complete the table below.

Test	Expected result if solid is a metal	Expected result if solid is a non-metal

[6]

Examiner Only	
Marks	Remark

(e) Some metals are more reactive than others. Read the sentences below and answer the questions which follow.

- Iron can displace copper but cannot displace zinc.
- Magnesium can displace iron and zinc but cannot displace calcium.

From these two statements write down whether each of the sentences below is **true** or **false** or **not possible to work out**.

(i) Magnesium can displace copper.

_____ [1]

(ii) Zinc can displace calcium.

_____ [1]

(iii) If the five metals, calcium, copper, iron, magnesium and zinc, are placed in order of reactivity, zinc is in the middle.

_____ [1]

(iv) If lead can displace copper then lead can also displace iron.

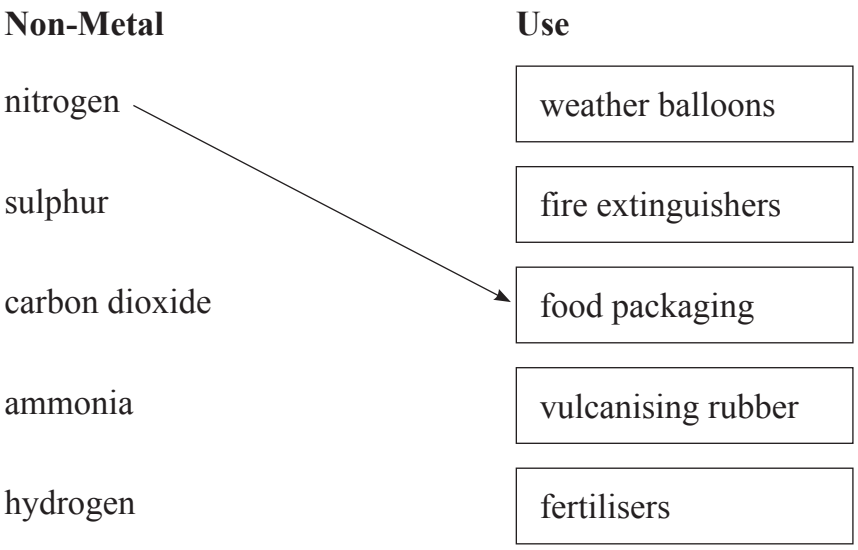
_____ [1]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

3 This question is about some non-metals and their compounds.

(a) Non-metals have many uses. Use a line to match each non-metal with a use. The first one has been done for you.



[3]

(b) Hydrogen is a gas.

(i) Give **two** other **physical** properties of hydrogen.

1. _____ [1]

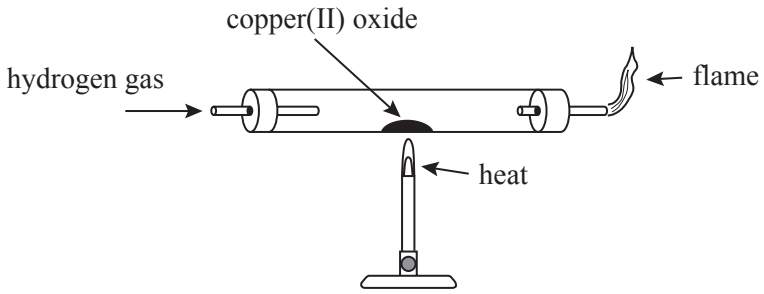
2. _____ [1]

(ii) Give **two** uses of hydrogen.

_____

_____ [2]

The diagram below shows how hydrogen can be used to reduce copper(II) oxide.



(iii) Write a balanced symbol equation for the reaction of hydrogen with copper(II) oxide.

_____ [2]

(c) Sulphur is an impurity in coal and oil. When these fuels burn they produce an acidic gas which causes acid rain.

(i) Name this acidic gas which causes acid rain.

_____ [1]

(ii) Circle the pH value, which you would expect a lake to have which has been polluted by acid rain.

0 **3** **7** **9** **13** [1]

(iii) Give **one** harmful effect of acid rain.

_____ [1]

Examiner Only

Marks	Remark

Power stations must control their emissions of acidic gases.

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Marks	Remark

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(iv) Give one way of controlling the emission of gases from power stations.

_____ [1]

(d) The land around Ballymoney, in County Antrim, is very rich in a fuel called lignite. To obtain the lignite a type of mining is used where the surface soil and earth is removed so that the lignite can be taken out.

Describe the advantages and disadvantages of having a lignite mine close to the town of Ballymoney. You will also be marked on the quality of your written communication.

Advantages: _____

_____

_____

_____

Disadvantages: _____

_____

_____

_____ [6]

Quality of written communication [1]

Examiner Only	
Marks	Remark

4 **(a)** You will need your Data Leaflet to help you answer this question.

(i) List **two** things that the elements beryllium, magnesium and calcium have in common.

_____

_____

_____ [2]

(ii) Group VII has five elements: bromine, chlorine, fluorine, iodine and one other element.

1. What is the common name for Group VII elements?

_____

2. Name the other Group VII element.

_____

3. Which of the Group VII elements is the most reactive?

_____ [3]

(b) This part of the question is about some reactions of Group I metals with water.

Group I
Li
Na
K

(i) What name is given to the Group I metals?

_____ [1]

(ii) What do you observe happening when a small amount of sodium is added to water?

_____

_____

_____

_____

_____

_____ [4]

(iii) Why is the reaction in part **(ii)** carried out with a **small** amount of sodium?

_____ [1]

(iv) Complete the word equation for the reaction of sodium with water.

sodium + water → + [2]

(v) In what way would you expect the reaction of lithium with water to be different to the reaction of sodium with water and why would it be different?

_____

_____ [2]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

(c) This part of the question is also about Group II metals and their compounds.

(i) When calcium reacts with water the water goes cloudy. What compound has been formed which makes the water go cloudy?

_____ [1]

(ii) Complete the symbol equation below for the reaction of calcium carbonate with hydrochloric acid.

$CaCO_3 + 2HCl \rightarrow$ _____ + _____ + CO_2 [2]

(iii) Magnesium oxide is an ionic solid. This means it will have a high melting point. Give **two** other physical properties you expect a typical ionic solid to have.

_____

_____ [2]

THIS IS THE END OF THE QUESTION PAPER