Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
2010

Science: Double Award (Modular)

Paper 2
Foundation Tier

[G8202]

WEDNESDAY 26 MAY, MORNING

G8202

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 **2(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 provided.

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

Examiner Only	
Marks	Remark

1 This part of the question is about man-made materials.

(a) The following list contains natural and man-made materials. Complete the table showing the materials that are man-made and those that are natural. One has been done for you.

wood **plastic** **silk** **cotton**

glass **aluminium** **nylon**

man-made material	natural material
nylon	

[3]

(b) Select from the following list to complete the sentences below:

strength **easy to mould** **transparent** **brittle**

low melting point **a conductor** **high melting point**

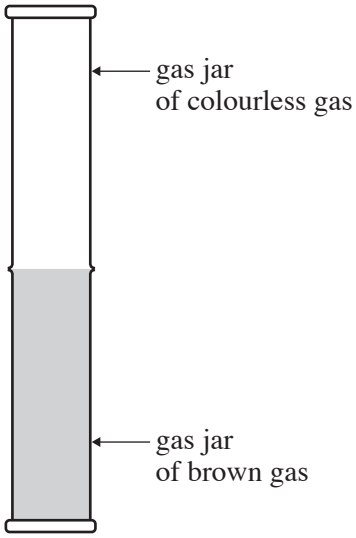
(i) Bridges are made of iron because of its _____ and low cost.

(ii) Glass is used in oven doors as it is _____ and easy to clean.

(iii) Ceramic oven dishes have a _____ and this allows the food to be cooked fairly quickly. [3]

Examiner Only	
Marks	Remark

(c) Two gas jars, one filled with a brown gas and another with a colourless gas were placed together as shown in the diagram.



(i) Describe what you would see starting to happen in the two gas jars.

_____

_____ [1]

(ii) Describe what you would eventually see in the two jars.

_____

_____ [1]

(iii) Circle a word from the following list that describes the process that has happened to the gases.

distillation **oxidation** **diffusion** **evaporation** [1]

(iv) If the temperature was increased how would the time for the process change? Circle the correct answer.

It would stay the same **It would take longer**

It would take less time [1]

Examiner Only	
Marks	Remark

(d) For each of the statements below three answers are given. Only **one** is correct. Circle the correct answer. One has been done for you. You may find your Data Leaflet helpful.

The element with the symbol **N** is:

nitrogen neon niobium

(i) The correct chemical symbol for sulphur is:

Su **S** **Na** [1]

(ii) The alkali with the formula $Ca(OH)_2$ is:

calcium hydride **calcium oxide** **calcium hydroxide** [1]

(iii) The correct chemical formula for magnesium carbonate is:

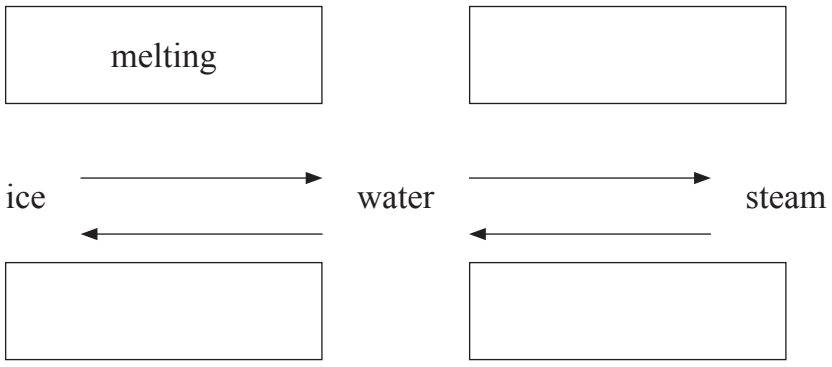
$MgCO_3$ **$MgCo_3$** **$MGCO_3$** [1]

(iv) The name of the compound with the formula Li_2SO_4 is:

lithium sulphite **lithium sulphate** **lithium sulphide** [1]

(e) The diagram below shows how H_2O changes from solid to liquid to gas.

Fill the missing spaces to name the processes involved in the changes of state.



[3]

(f) Elements exist as solids, liquids or gases.

Examiner Only	
Marks	Remark

(i) Which of these is the correct definition of an element? Tick (✓) the correct answer.

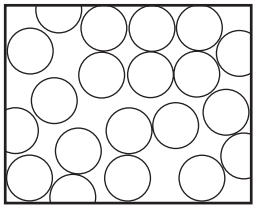
An element is a pure substance containing one type of molecule ☐

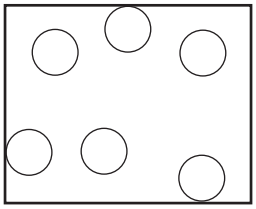
An element is a pure substance containing one type of atom ☐

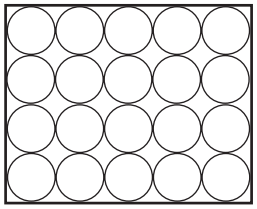
An element is a pure substance containing one type of compound ☐

[1]

(ii) The diagrams below show the arrangement of particles in a solid, a liquid and a gas. Label each diagram correctly.







_____ _____ _____ [2]

Examiner Only	
Marks	Remark

2 **(a)** Metals are elements which have their own particular properties.

(i) Name **one** metal which is very dense. Choose your answer from the list below.

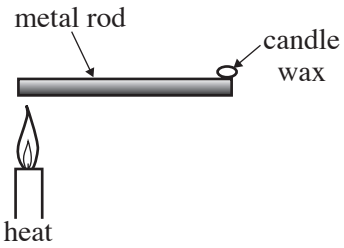
sodium **magnesium** **calcium** **lead**

_____ [1]

(ii) Many metals can be stretched into wires. Circle the correct word, from the three given, which means **"can be stretched into wires"**.

ductile **malleable** **lustrous** [1]

(iii) A piece of candle wax was attached to one end of a 30 cm metal rod. The other end of the rod was heated.



(1) What would you expect to happen to the candle wax?

_____ [1]

(2) Why would this happen to the candle wax?

_____

_____

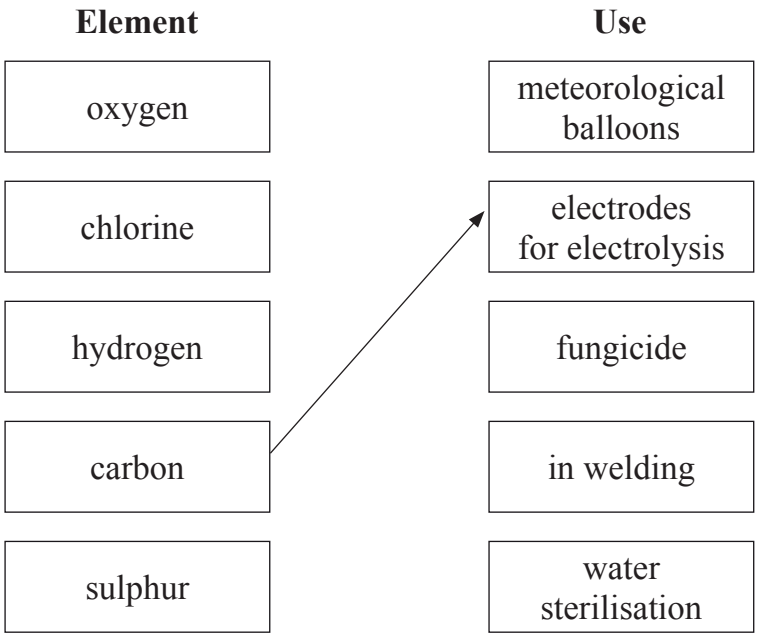
_____ [2]

Quality of written communication [1]

Examiner Only	
Marks	Remark

(b) Non-metal elements have many different uses.
Draw a line to match each use to the correct element. One has been done for you.

(HINT Only **one** use for each element has been given.)



[3]

(c) Peat or turf is found throughout Ireland. It is dug from the ground, cut into pieces and then dried before being used.

(i) What is peat used for?

_____ [1]

(ii) Give **one** advantage of peat cutting.

_____ [1]

(iii) Give **two** disadvantages of peat cutting.

1. _____

2. _____ [2]

(d) Chemical reactions can be classified as exothermic or endothermic.

Examiner Only	
Marks	Remark

(i) What is the meaning of the term **endothermic**?

_____

_____ [1]

(ii) The table below shows the temperature change during a number of reactions.

reaction	reactants	temperature before reaction (°C)	temperature during reaction (°C)
A	iron and sulphur	17	200
B	ammonium carbonate and ethanoic acid	17	14
C	zinc and copper sulphate solution	17	22

Classify the reactions A, B, C as exothermic or endothermic.

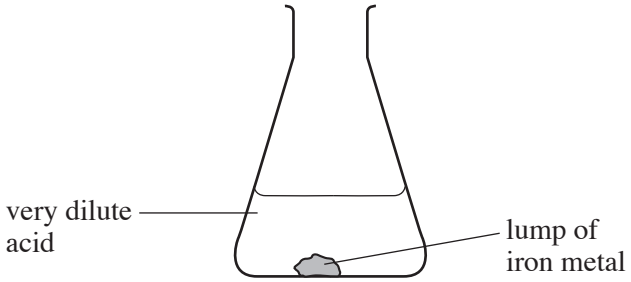
Exothermic _____

Endothermic _____ [2]

(iii) Complete the following sentence using **either** the word exothermic or endothermic.

All combustion reactions are _____. [1]

(e) A chemistry teacher was demonstrating the reaction of a lump of iron metal with a very dilute acid.



Unfortunately the reaction was very slow.

Give **three** things the teacher could have done to speed up the reaction.

1. _____

2. _____

3. _____ [3]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

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

(a) Complete the table below which describes tests for some common substances.

substance	test	result
hydrogen		pops
carbon dioxide	limewater	
	glowing splint	relights
water	anhydrous copper sulphate	

[4]

(b) Chlorine is a reactive Group 7 element and is composed of **diatomic** molecules.

(i) Explain the meaning of the term **diatomic**.

_____

_____ [1]

(ii) Explain the meaning of the term **molecule**.

_____

_____ [2]

(iii) Chlorine has two isotopes, ^{35}Cl and ^{37}Cl. Complete the table below to show the atomic structure of these two isotopes.

isotope	number of electrons	number of neutrons	number of protons
^{37}Cl	17	20	17
^{35}Cl			

[3]

(iv) When chlorine is passed into a solution of potassium bromide a displacement reaction takes place and potassium chloride and bromine are formed.

Describe the colour change which would be observed in this reaction.

Colour of solution at the start _____

Colour of solution at the end _____ [2]

(c) Burning fossil fuels containing sulphur produces a gas, **Z**, which causes acid rain.

(i) Name this gas, **Z**, that causes acid rain to be formed.

_____ [1]

(ii) Give **two** reasons why acid rain is a serious environmental problem.

1. _____

2. _____ [2]

(iii) Give **one** way that fossil fuel power stations which burn fossil fuels can help to reduce the amount of gas, **Z**.

_____

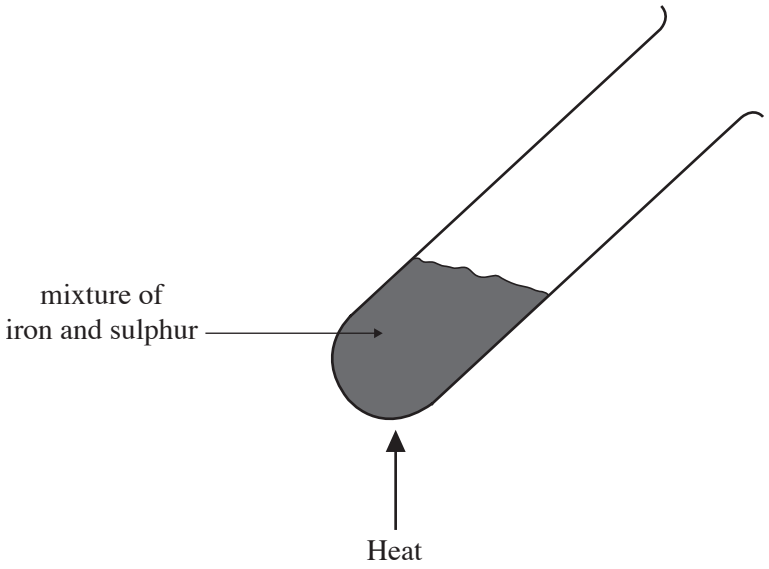
_____ [1]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

(d) When sulphur and iron are heated they react to form a compound, iron (II) sulphide.



(i) Describe the appearance of sulphur.

_____ [2]

(ii) Give **two** things you would observe when iron reacts with sulphur.

1. _____

2. _____ [2]

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(Questions continue overleaf)

Examiner Only	
Marks	Remark

4 This question is about metals and their compounds. You may find your Data Leaflet useful.

(a) Calcium and magnesium are both alkaline earth metals.

(i) To which Group in the Periodic Table do calcium and magnesium belong?

_____ [1]

(ii) Describe **two** things you would observe happening when a piece of magnesium ribbon is burned in air.

1. _____

2. _____ [2]

(iii) Complete the word equation for the reaction of magnesium with oxygen.

magnesium + oxygen → [1]

(b) Calcium metal reacts with water.

(i) Describe **three** things you would observe happening when calcium is added to water.

1. _____

_____

2. _____

_____

3. _____

_____ [3]

(ii) Give **one** safety precaution which should be taken when carrying out the reaction between calcium and water.

_____ [1]

(iii) Complete the word equation for the reaction of calcium with water.

calcium + water → + [2]

Examiner Only	
Marks	Remark

(c) Magnesium reacts very slowly with water but it reacts quite quickly with steam.

(i) What gas is formed when magnesium reacts with steam?

_____ [1]

(ii) What is the other product of the reaction of magnesium with steam?

_____ [1]

(d) Copper sulphate can be made by reacting solid green copper carbonate powder with dilute sulphuric acid.

(i) Describe **two** things you would observe happening when copper carbonate reacts with sulphuric acid.

1. _____

2. _____ [2]

(ii) Why can copper sulphate not be prepared by adding dilute sulphuric acid directly to copper?

_____ [1]

(e) Magnesium powder reacts quickly when stirred with copper(II) sulphate solution. Describe the colour change of the solution in this reaction.

(i) From _____ to _____ [2]

(ii) Write a balanced **symbol** equation for the reaction of magnesium with copper(II) sulphate.

_____ [2]

(iii) What **type** of chemical reaction is the reaction between magnesium and copper sulphate?

_____ [1]

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