



Rewarding Learning

General Certificate of Secondary Education
2011–2012

Science: Single Award (Modular)

Materials and their Management

Module 4

Foundation Tier

[GSC41]

WEDNESDAY 9 NOVEMBER 2011

10.15 am–11.00 am



Centre Number

71	
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Candidate Number

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TIME

45 minutes.

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 seven** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 45.

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 your use.

For Examiner's use only

Question Number	Marks
1	
2	
3	
4	
5	
6	
7	

Total Marks	
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2 (a) Below are four methods of crime detection. Using lines, link each method of detection to the evidence it can provide.

Method of detection

Evidence provided

Microscope

Metals in car paint at a hit and run accident

Breathalyser

Forged banknotes

Chromatography

Driver over the drink-drive limit

Flame test

Appearance of cotton at the scene of a robbery

Different dyes in the ink of a forged cheque

[4]

(b) Shown below is a picture of a banknote.



© Bank of England

Give two features of a banknote that help prevent forgeries.

1. _____

2. _____ [2]

Examiner Only	
Marks	Remark

3 (a) Complete the sentences below about hard water.

Choose from:

**baking soda : sodium : basalt : magnesium :
limestone : lather : washing soda**

(i) Hard water is difficult to _____ with soap.

(ii) Compounds of calcium and _____ cause hardness in water.

(iii) Adding _____ removes permanent and temporary hardness.

(iv) Stalagmites and stalactites are formed from the reaction of rainwater and _____ .

[4]

(b) In the table below place a tick (✓) beside the **two** statements that are advantages of hard water.

Produces fur in kettles	
Good for teeth and bones	
Clogs up water pipes	
Tastes good	
Good for washing clothes	

[2]

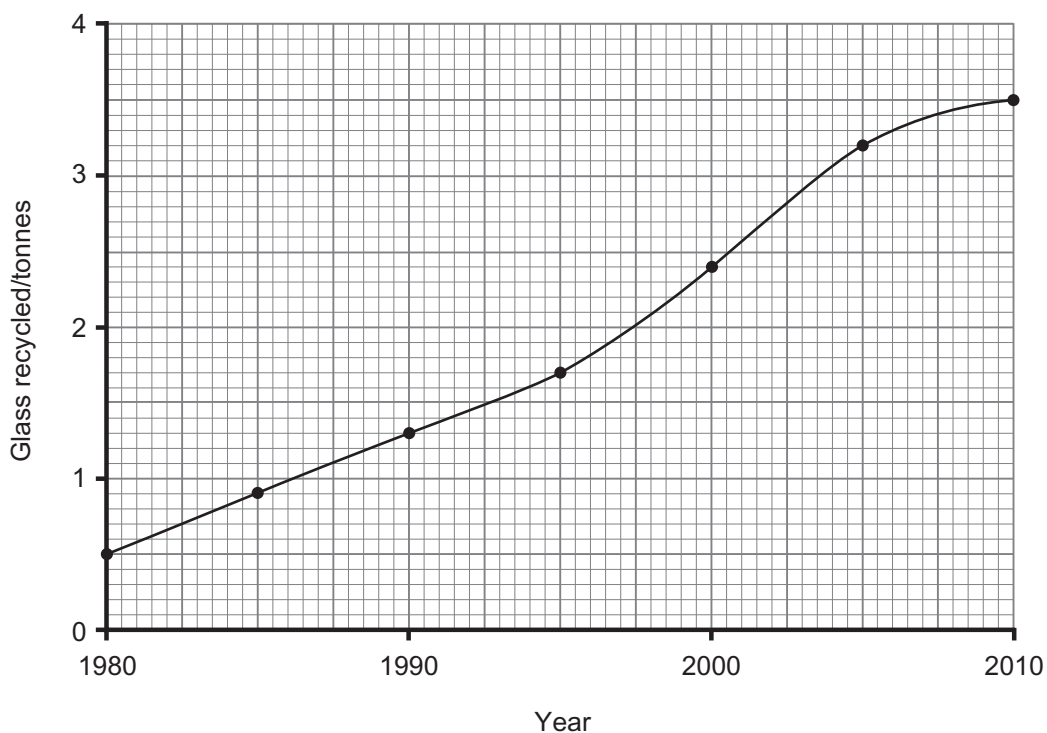
(c) Suggest how the Marble Arch Caves can be of benefit to the people of County Fermanagh.

_____ [1]

Examiner Only

Marks Remark

- 4 The graph below shows information about the recycling of glass by a small company.



- (a) Complete the following sentence giving a trend shown by the graph.

From 1980 to 2010 there has been _____
 _____ [1]

- (b) Use your graph to calculate the change in the amount of glass that the company recycled between 1980 and 2010.
 Show your working.

_____ tonnes [2]

- (c) Give two reasons why it is important to recycle glass.

1. _____
 2. _____ [2]

Examiner Only	
Marks	Remark

(d) Glass is only one of many materials that can be recycled. Other common examples are aluminium, plastic and paper.

(i) Which of the above materials is an element?

[1]

(ii) Give two ways that local councils are promoting the recycling of plastics.

1. _____

2. _____ [2]

Examiner Only	
Marks	Remark

6 The properties of some metals are given below.

Metal	Melting temperature/°C	Electrical conductivity	Relative cost	Relative weight	Relative strength
Aluminium	660	Very good	7.3	1	1
Copper	1083	Excellent	9.2	3	2
Iron	1535	Good	1	2.3	3
Silver	962	Excellent	1923	2.6	1
Zinc	420	Good	5.8	2.3	1.5

Use the information and your knowledge to answer the following questions.

(a) Suggest which **one** of the properties is most important when using aluminium for aircraft construction.

_____ [1]

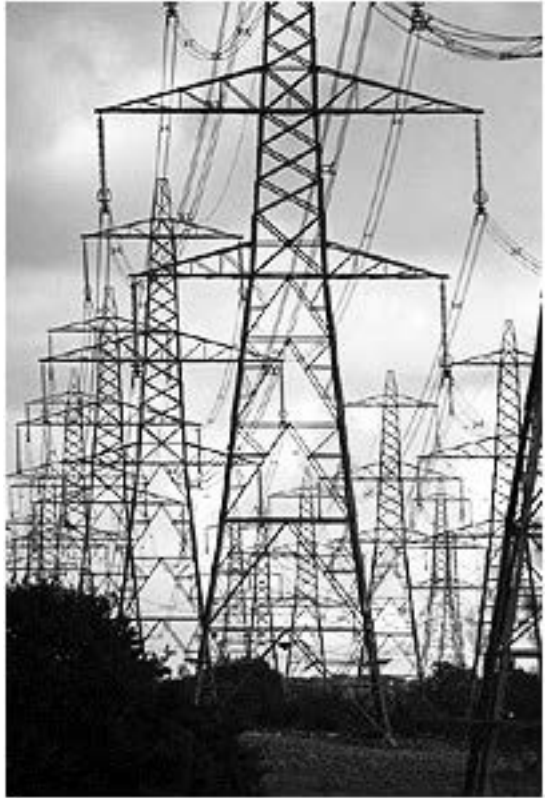
(b) Give two reasons why iron is used in the construction of buildings rather than zinc.

1. _____

2. _____ [2]

Examiner Only	
Marks	Remark

(c) Below is a picture showing part of the national grid.



© PA Wire / Press Association Images

Explain fully why overhead electrical cables in the national grid are made of aluminium rather than copper.

[3]

Examiner Only	
Marks	Remark

7 (a) The following hydrocarbons are obtained from crude oil.

paraffin : naphtha : petrol : bitumen : lubricating oil



© iStockphoto / Thinkstock

(i) Name the process that is used to obtain these hydrocarbons from crude oil.

_____ [2]

(ii) Which of the hydrocarbons in the list above has the highest boiling point?

_____ [1]

(iii) Give **one** important use of bitumen.

_____ [1]

(iv) Complete the word equation to show what products are produced when petrol burns.

petrol + oxygen \longrightarrow _____ + _____ [2]

Examiner Only

Marks Remark

(b) Explain fully why scientists are always trying to find more effective ways of extracting crude oil.

[2]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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