



Centre Number

71

Candidate Number

General Certificate of Secondary Education  
2010–2011

**Science: Single Award (Modular)**  
Chemical Patterns and our Environment  
Module 3  
Foundation Tier  
[GSC31]



TUESDAY 9 NOVEMBER 2010, AFTERNOON

**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 is provided for use with this paper.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	

<b>Total Marks</b>	
--------------------	--



- 1 (a) The pictures below show substances found in the home. Draw one line from each substance to the chemical it contains.

**Household substance**

Image of a bottle of Milk of Magnesia

Image of lemon slices and a lemon

Image of a bottle of vinegar

**Chemical name**

Magnesium hydroxide

Ethanoic acid

Citric acid

Sodium hydroxide

[3]

- (b) What name is given to a substance which can change colour in acids and alkalis?

Choose from:

**neutraliser**

**base**

**indicator**

**medicine**

\_\_\_\_\_ [1]

Examiner Only	
Marks	Remark



2 (a) The pH scale is shown below.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
---	---	---	---	---	---	---	---	---	----	----	----	----	----

(i) What is the pH number of pure water? \_\_\_\_\_ [1]

(ii) Which of the following could have a pH of 1?

Circle the correct answer.

**lemon juice** : **sodium hydroxide** : **hydrochloric acid** [1]

(iii) How would you describe a liquid with a pH of 10?

Circle the correct answer.

**strong acid** : **weak alkali** : **strong alkali** [1]

The picture below shows a farmer putting lime on the soil.



© N Herendeen

(b) Explain fully why farmers sometimes put lime on the soil.

---

---

---

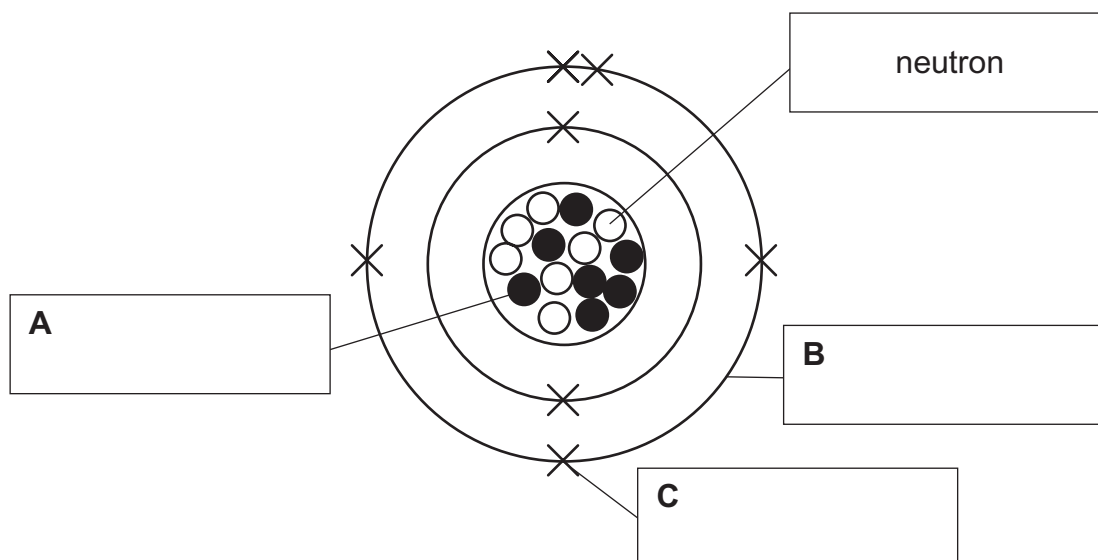
---

[2]

Examiner Only

Marks Remark

3 The diagram shows an atom of nitrogen.



(a) Name the parts labelled **A**, **B**, and **C** on the diagram above. [3]

(b) Complete the following sentence.

Choose from:

7

14

21

The atomic number of nitrogen is \_\_\_\_\_ . [1]

(c) An oxygen atom has eight electrons.

In the space below draw a diagram to show how these eight electrons are arranged in an atom of oxygen.

[1]

Examiner Only

Marks Remark



(d) This recipe includes vinegar. When vinegar is added the baking soda undergoes two different types of chemical reaction during the cooking process.

Circle the **two** correct reaction types.

**neutralisation : displacement : thermal decomposition**

**combustion : oxidation** [2]

5 The table below gives some elements from four different groups of the Periodic Table.

A	B	C	D
carbon	helium	chlorine	lithium
silicon	neon	bromine	sodium
lead	argon	iodine	potassium

Use the information in the table and your Data Leaflet to answer the following questions.

(a) (i) Which group **A**, **B**, **C** or **D** belong to the halogens?

\_\_\_\_\_ [1]

(ii) Which group **A**, **B**, **C** or **D** is described as being chemically inert?

\_\_\_\_\_ [1]

(iii) Give the name for this group of inert elements.

\_\_\_\_\_ [1]

(iv) What name is given to the type of elements in group **D**?

\_\_\_\_\_ [1]

(b) State three things that would happen if a small piece of lithium was dropped into a trough of cold water.

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_ [3]

Examiner Only

Marks Remark

- 6 (a) In February 2008 there was a small earthquake in the south of England. It happened at one o'clock in the morning.

Suggest **two** reasons why it could injure more people so early in the morning.

---

---

---

 [2]

- (b) The table below shows the effects of different strengths of earthquakes.

Number on Richter Scale	Effect of earthquake
2	Trees sway, ponds ripple, doors swing slowly. People cannot tell that it is an earthquake.
4	Buildings shake, dishes rattle, windows rattle.
6	Furniture moves, plaster can fall, walls may crack.
8	Buildings fall down, bridges collapse, lives are lost.

Earthquakes are quite common in the UK, but most are less than 2 on the Richter Scale.

Suggest one reason why most are not reported and explain your answer.

---

---

---

 [2]

- (c) Given below are some comments from BBC reporters just after the 2008 earthquake.

**“Everything started wobbling. The windows were rattling and the blinds were moving.”**

**“I went outside in my dressing gown to see if the roof had collapsed.”**

**“Cracks appeared in the ceiling and some plaster fell. All the cupboard doors flew open.”**

Examiner Only	
Marks	Remark







---

**THIS IS THE END OF THE QUESTION PAPER**

---

Permission to reproduce all copyright material has been applied for.  
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA  
will be happy to rectify any omissions of acknowledgement in future if notified.