



Rewarding Learning

General Certificate of Secondary Education  
2011–2012

**Science: Single Award (Modular)**

Chemical Patterns and our Environment

Module 3

Foundation Tier

[GSC31]

TUESDAY 28 FEBRUARY 2012

11.00 am–11.45 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 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>	
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2 (a) Below are some food additives and their functions.

Match each food additive to its function by drawing straight lines.

One has been done for you.

Food Additive	Function
sweeteners	makes food look attractive
emulsifiers	alternative to sugar
colourings	controls pH
anti-oxidants	stabilises oil and water mixtures
	stops fats from going off

[3]

(b) All additives have a number which starts with a letter of the alphabet.

What is this letter?

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

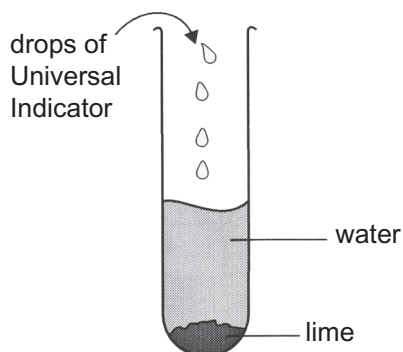
(c) Give **two** problems with putting additives in food.

\_\_\_\_\_  
\_\_\_\_\_ [2]

Examiner Only	
Marks	Remark

**BLANK PAGE**  
**(Questions continue overleaf)**

- 3 Lime is a substance that farmers add to soil.  
When Universal Indicator and water are added to a sample of lime, there is a change in colour.



- (a) What colour would the indicator be?

Circle the correct answer.

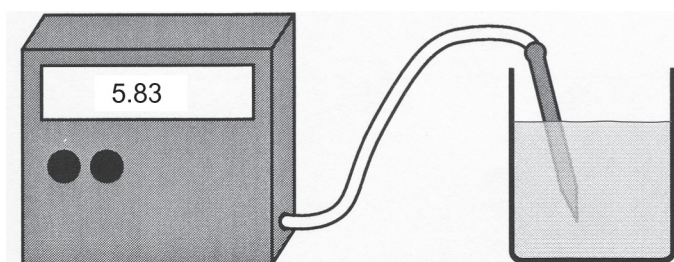
**red : green : purple** [1]

- (b) Complete the sentence below.

Red cabbage is a plant that contains a dye which changes colour in acid and alkaline solutions.

This type of dye is called an \_\_\_\_\_ . [1]

- (c) The diagram below shows another way of testing if a soil sample is acidic.



- (i) What name is given to this type of apparatus?

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

- (ii) Suggest **one** advantage of using this apparatus.

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

Examiner Only	
Marks	Remark

(d) Explain fully why farmers sometimes add lime to the soil.

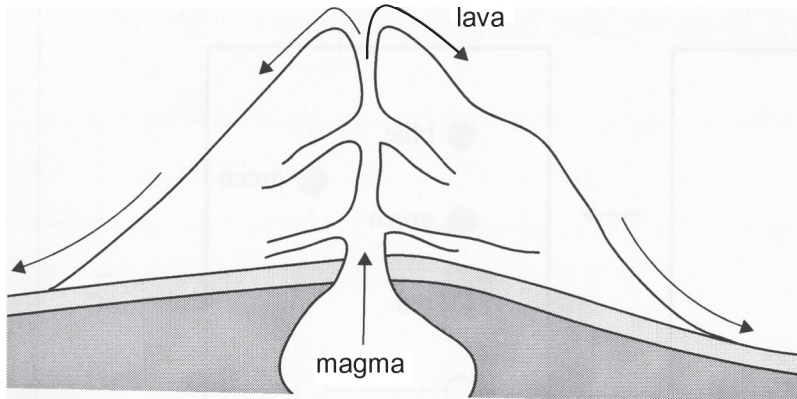
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[2]

Examiner Only	
Marks	Remark

4 The diagram below shows an active volcano.



(a) Use the diagram to explain fully what happens when a volcano erupts.

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[2]

(b) In March 2011 an earthquake off the coast of Japan caused a tsunami. State what a tsunami is and give **two** problems it can cause.

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[3]

(c) The earthquake in March 2011 in Japan measured 9.5 on a scale. What is the name of the scale used to measure earthquakes?

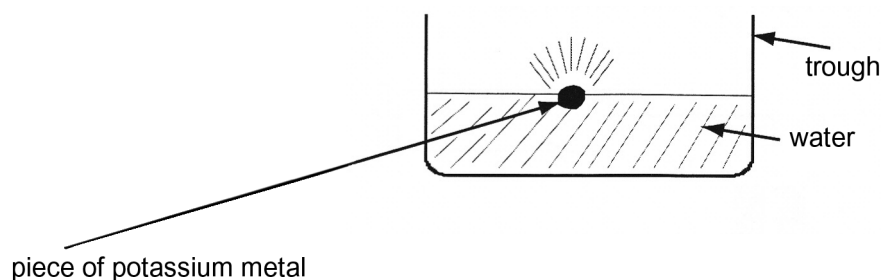
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[1]

Examiner Only	
Marks	Remark



- 5 Jack watched his teacher do an experiment with potassium metal and water.



Jack recorded his observations as follows:

- the potassium caught fire immediately
- it had a lilac flame
- it melted to form a shiny ball
- it moved quickly across the water surface
- a gas was given off
- a colourless solution was formed

The word equation for this reaction is:



Use the information above to answer the following questions.

- (a) Give **one** piece of evidence that shows potassium is lighter than water.

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

- (b) What is the name of the gas produced in this experiment?

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

- (c) Give **one** piece of evidence that this reaction produces heat.

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

- (d) Name the substance produced which is an alkali.

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

Examiner Only

Marks Remark



(d) Magnesium metal burns in air to produce the compound magnesium oxide.

The formula for magnesium oxide is MgO.

Calculate the **total number** of particles in magnesium oxide.

You may find your Data Leaflet helpful.

protons \_\_\_\_\_

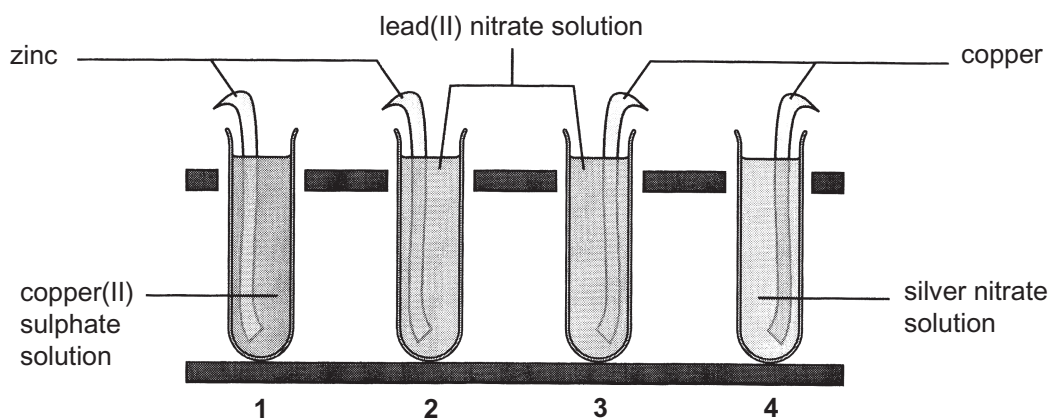
electrons \_\_\_\_\_

neutrons \_\_\_\_\_

[3]

Examiner Only	
Marks	Remark

- 7 David did an experiment to investigate which metals are the most reactive. He set up the apparatus as shown in the diagram below.



He recorded his results in a table as follows:

Test tube	Appearance of solution at start	Appearance of metal at start	Appearance of solution after 2 hours	Appearance of metal after 2 hours
1	blue	silvery colour	colourless	reddish brown deposit
2	colourless	silvery colour	colourless	greyish white deposit
3	colourless	reddish brown colour	colourless	silvery colour no deposit
4	colourless	reddish brown colour	blue	greyish deposit

Use this information to answer the following questions.

- (a) What name is given to a reaction in which one metal takes the place of another metal?

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

- (b) In which test tube, 1, 2, 3, or 4, was there no chemical reaction?

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

- (c) Name the reddish brown deposit on the zinc metal in test tube 1.

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

Examiner Only

Marks Remark







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