



Rewarding Learning

General Certificate of Secondary Education
2011–2012

Science: Single Award (Modular)

Electricity, Waves and Communication

Module 5

Foundation Tier

[GSC51]

MONDAY 14 NOVEMBER 2011

1.30 pm–2.15 pm



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 six** 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.

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



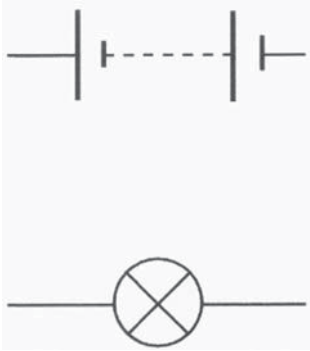
- 1 (a) Given below are the names of some electrical components and descriptions of what they do.

Using lines, match each component with its correct description.

Component	Description
Ammeter	Measures voltage
Voltmeter	Measures current
Battery	Changes electricity to light
Bulb	Changes chemical energy to electricity

[3]

- (b) Some pupils wanted to find the resistance of a bulb. Part of their circuit is shown below.



- (i) Complete the circuit by adding, in the correct places, the symbols for an ammeter and a voltmeter. [3]

Examiner Only	
Marks	Remark

- (ii) When the experiment was carried out it was found that the voltmeter reading was 5 V and the ammeter reading was 2 A.

Use the equation:

$$\text{resistance} = \frac{\text{voltage}}{\text{current}}$$

to calculate the resistance of the bulb.

Resistance = _____ [2]

- (iii) Name the unit of resistance.

Choose from:

amp

ohm

volt

joule

_____ [1]

Examiner Only

Marks

Remark

(c) Reflected sounds can cause problems in the concert hall.

(i) What do we call reflected sounds?

_____ [1]

(ii) Explain fully what is done to minimise reflected sounds.

_____ [2]

Examiner Only	
Marks	Remark

- 4 (a) The following information was sent to mobile phone users asking them to take part in a medical study.

COSMOS is an international study on mobile phone use and possible long term effects on health. In the UK the research will be carried out by a university that will follow the health of 100,000 mobile phone users for 20 to 30 years.

- (i) Suggest a long term effect on health caused by mobile phone use that the researchers might be interested in.

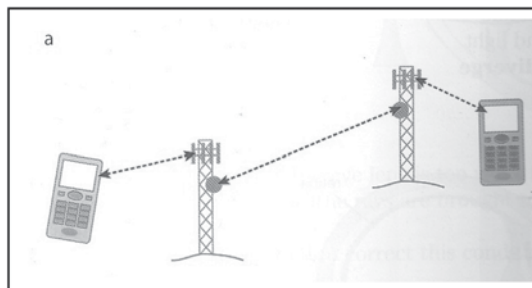
_____ [1]

- (ii) State two features about the study that will give reliable results.

1. _____ [1]

2. _____ [1]

- (b) Mobile phones work by sending signals to and from phone masts which boost the signal before passing it on.



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- (i) Name the type of electromagnetic wave that carries these signals.

_____ [1]

- (ii) What is the name given to the area around a phone mast?

_____ [1]

Examiner Only

Marks Remark

(c) Telephone messages can be sent along copper wires or optical fibres.

(i) Name **one** type of electromagnetic wave that can travel through optical fibres.

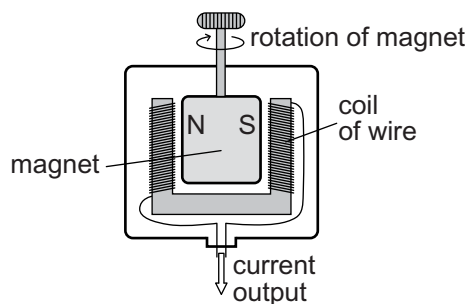
_____ [1]

(ii) Suggest what flows through copper wire when used as a phone connection.

_____ [1]

Examiner Only	
Marks	Remark

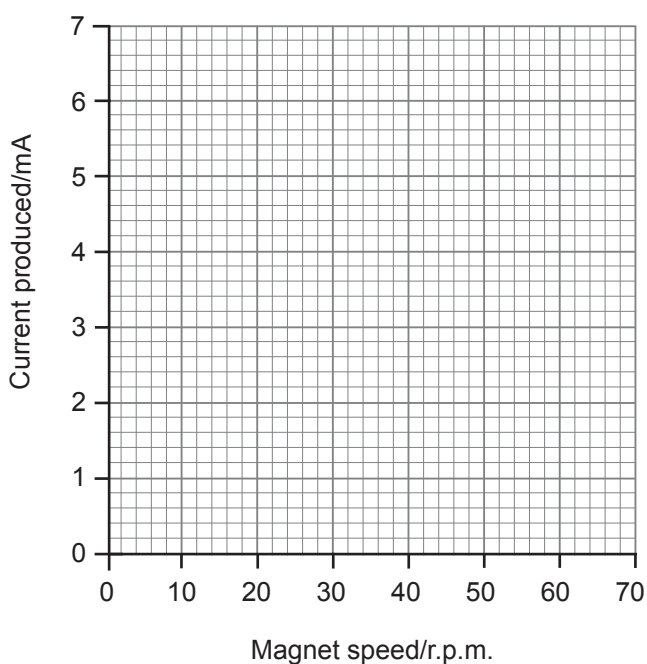
- 5 An investigation was carried out using a bicycle dynamo to find how the amount of current produced depends on the speed of rotation of a magnet.



The investigation results are given below.

Magnet speed/r.p.m.	Current produced/mA
	0
20	2.2
30	3.4
40	4.4
50	5
60	5
70	5

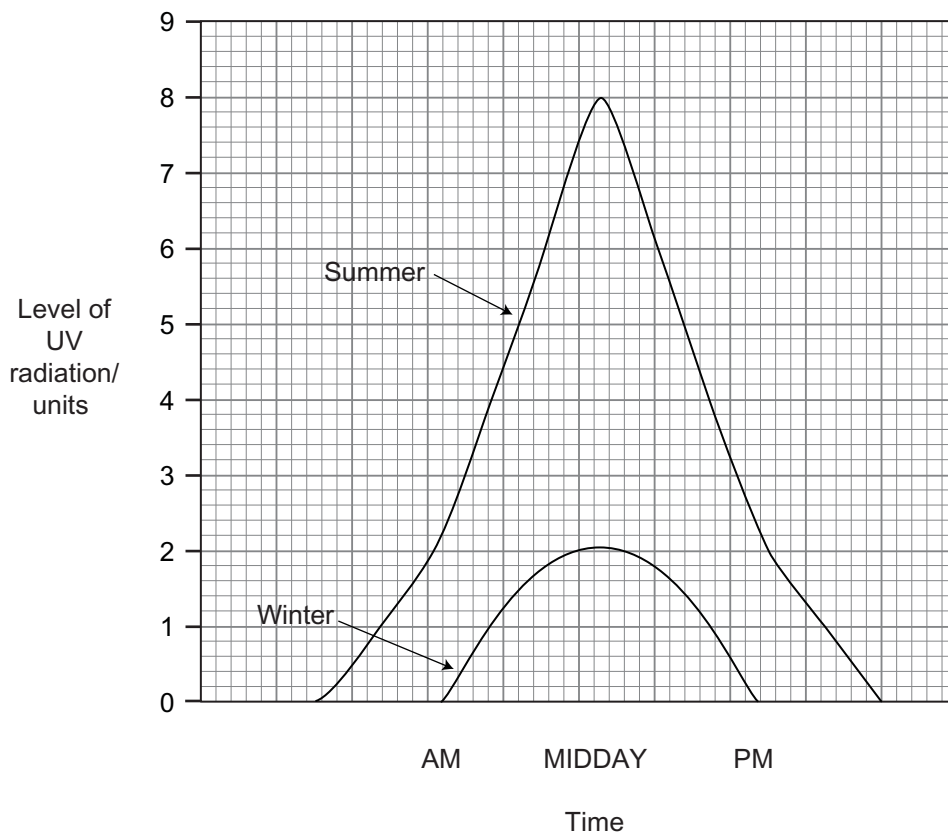
- (a) Plot the points and draw a line graph on the grid below.



[3]

Examiner Only	
Marks	Remark
0	

- 6 The graph below shows how the level of ultraviolet (UV) radiation changed during typical summer and winter days. Skin needs protection above 3 units of UV.



- (a) Use the information to suggest why sunscreen (sun protection) sales are greater in summer.

[1]

Examiner Only	
Marks	Remark

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