



Centre Number

71

Candidate Number

General Certificate of Secondary Education  
2009–2010

## Science: Single Award (Modular)

Electricity, Waves and Communication

Module 5

Higher Tier

[GSC52]



THURSDAY 20 MAY 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 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

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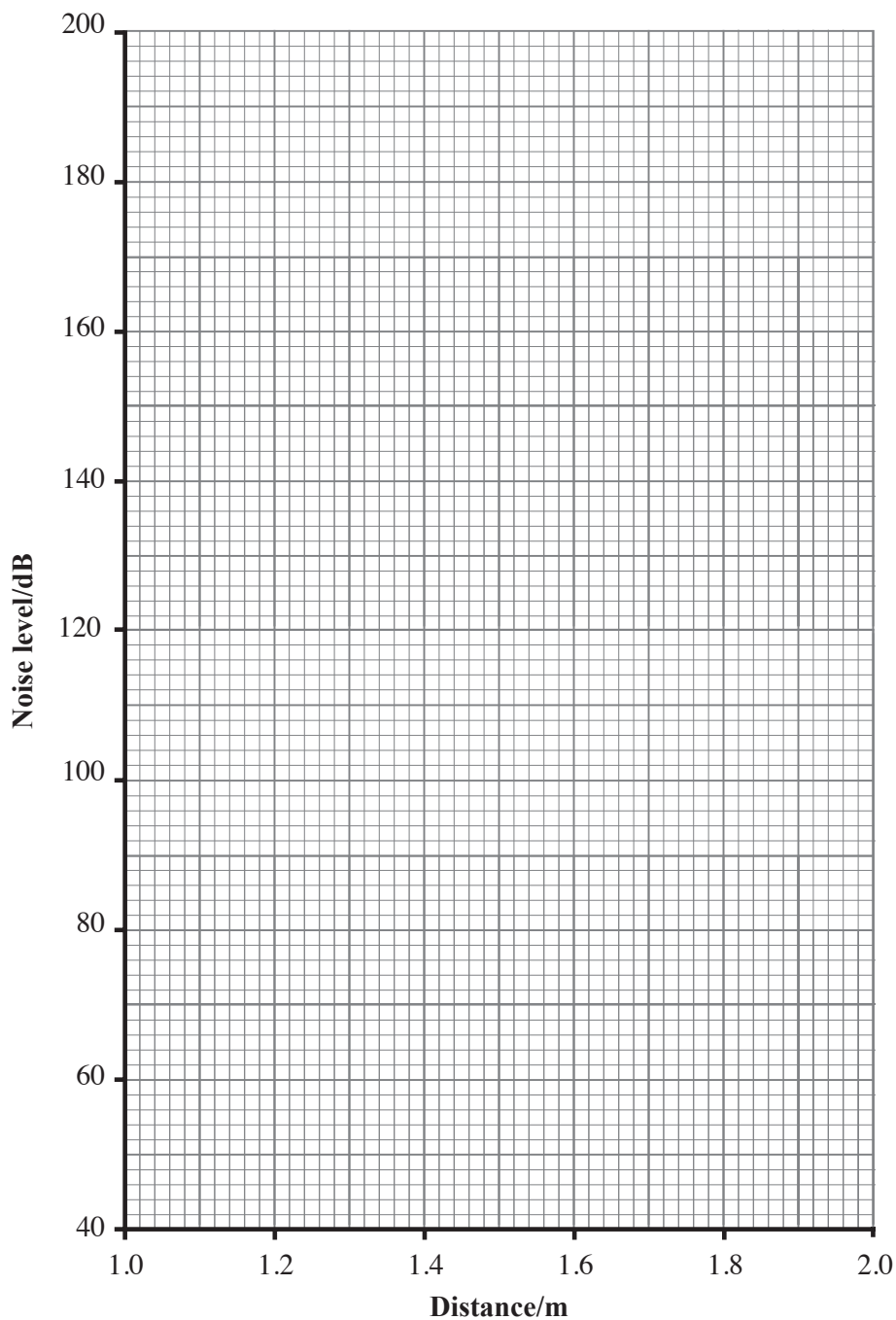
**(Questions continue overleaf)**

- 2 The table below gives noise levels in a concert at different distances from the loudspeakers.

Distance/m	Noise level/dB
1.0	180
1.2	125
1.4	92
1.6	70
1.8	56

- (a) (i) Plot these points on the grid below and draw a smooth curve.

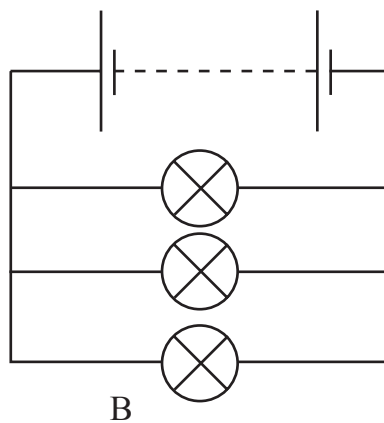
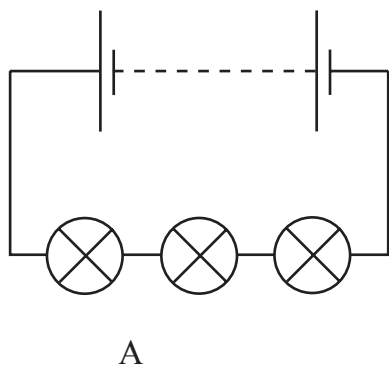
[3]



Examiner Only	
Marks	Remark



3 The circuit diagrams below show different ways of connecting three identical bulbs into a circuit.



(a) (i) What is the name given to describe how the bulbs are connected in each circuit?

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

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

(ii) Explain fully why the bulbs in circuit A will be dimmer than those in circuit B.

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

(b) Give **one** reason why it is better to have house lighting circuits connected as shown in circuit B rather than circuit A.

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

Examiner Only	
Marks	Remark

- (c) (i) In an experiment the voltage was found to be 9 V and the current 1.5 A.

Use the equation :

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

to calculate resistance.

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

- (ii) Name the unit of resistance.

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

Examiner Only

Marks Remark

- 4 The table below shows the electrical power ratings for a washing machine at various temperatures.

Temperature/°C	Power/W
30	350
40	650
50	900
60	1200

- (a) Describe the relationship between temperature and power.

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

- (b) (i) Calculate how many units of electricity are consumed during a 50°C wash cycle that lasts for 2 hours.

Use the equation:

$$\text{units of electricity (energy)} = \text{power} \times \text{time}$$

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

- (ii) What name is given to these units of electrical consumption?

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

Examiner Only	
Marks	Remark







(b) The table below compares the use of different energy sources to produce electricity.

Energy source	Carbon dioxide produced per kWh/g*	Construction cost/£ millions	Generating cost per kWh/pence	Output power/MW
Coal	1000	600	2.6	1800
Wind	4	1.4	3.3	3
Nuclear	5	1500	3.5	900
Hydroelectric	20	140	3.5	54

\* includes during construction

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

(i) How could someone justify the building of more coal power stations rather than nuclear power stations?

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[4]

(ii) Carbon dioxide causes global warming. Explain fully why using the wind to produce 54 MW of electricity will have a greater effect on global warming than producing the same amount of power using hydroelectric.

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[2]

(iii) Tidal energy is another source for generating electricity. Suggest why there are so few tidal generators being used in N. Ireland.

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[1]

Examiner Only	
Marks	Remark

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