

General Certificate of Secondary Education 2009–2010

## Science: Single Award (Modular)

Electricity, Waves and Communication

Module 5

Higher Tier

[GSC52]

# 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			



Centre Number				
71				

Candidate Number

5952

The lens	e spectacles shown in the picture below contain convex (converginges.	g) Examine Marks
(a)	(i) Describe fully what a convex lens does to parallel rays of lig	ht.
		[2]
	(ii) Name the other type of lens.	[1]
		[1]
(b)	The spectacles above are used to correct long sight.	
	Describe fully the cause of long sight and its effect on vision.	
		[3]

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(Questions continue overleaf)

200 180 160 140 Noise level/dB 120 100 80 60 40 1.2 1.8 1.0 1.4 1.6 2.0 Distance/m



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

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

**Examiner Only** 

Re

Marks

[3]

	(ii) State the conclusion that can be drawn from these results.	Examine	er Only
		Marks	Remark
	[1]		
	(iii) Use the graph to find the distance from the loudspeaker that gives a noise level of 80 dB		
	Answer m [1]		
	(iv) Sounds above 100 dB cause hearing damage. Use the graph to find the minimum distance that safety barriers should be placed at a concert.		
	Answer m [1]		
(b)	The walls of modern concert halls are lined with soft material. Explain fully why this is done.		
	[2]		
(c)	Humans can hear sounds with a frequency between 20Hz and 20kHz. What is the name given to sound with a frequency higher than 20kHz?		
	[1]		
	L*J		

А В (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]

The circuit diagrams below show different ways of connecting three

Examiner Only

Marks Rema

3

identical bulbs into a circuit.

(c)	(i)	In an experiment the voltage was found to be 9V and the currer 1.5A.	nt	Examin Marks	er Only Remark
		Use the equation :			
		voltage = current × resistance			
		to calculate resistance.			
		Answer	[2]		
	(ii)	Name the unit of resistance.			
			[1]		
		7		[77	
		I		IIUr	u over

Temperature/°C	Power/W	
30	350	
40	650	
50	900	
60	1200	
Calculate how many units of 50°C wash cycle that lasts for	f electricity are consumed during a for 2 hours.	l
Calculate how many units of 50°C wash cycle that lasts for Use the equation: units of electricit	f electricity are consumed during a for 2 hours. y (energy) = power × time	l
Calculate how many units of 50°C wash cycle that lasts for Use the equation: units of electricit	f electricity are consumed during a for 2 hours. y (energy) = power × time Answer	1 _ [3]

4





6 The diagram below shows the components of a fossil fuel power station.

Examiner Only

(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

Examiner Only Marks Remark

\* 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?

	[4]	
)	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.	
	[2]	
i)	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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