Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2010–2011

Science: Single Award (Modular)

Electricity, Waves and Communication Module 5

Foundation Tier

[GSC51]

GSC51

THURSDAY 24 FEBRUARY 2011, MORNING

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.

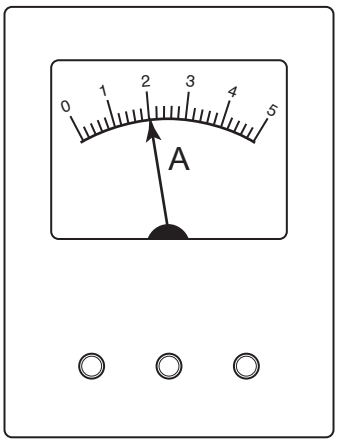
INFORMATION FOR CANDIDATES

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.

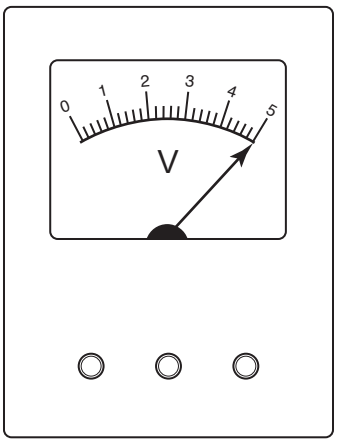
For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
Total Marks	

Examiner Only	
Marks	Remark

1 The diagrams below show two different electrical meters (A and B).



A



B

(a) For each meter (**A** and **B**) state the type of meter and the reading shown on it.

(i) Meter A

Type _____ [1]

Reading _____ A [1]

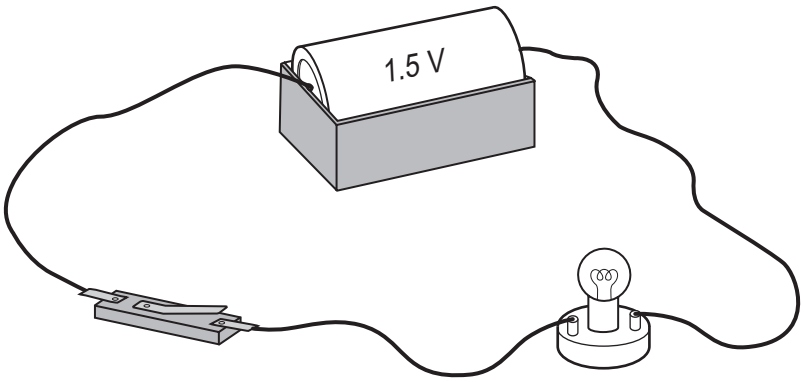
(ii) Meter B

Type _____ [1]

Reading _____ V [1]

(b) Shown below is a simple electric circuit.

Examiner Only	
Marks	Remark



(i) Complete the following sentence.

Choose from:

parallel **series** **short**

The circuit shown above is a _____ circuit. [1]

(ii) Using the correct symbols draw the diagram for this electrical circuit.

[3]

Examiner Only	
Marks	Remark

2 **(a)** Below are features of waves and their descriptions. Using lines, match each feature with the correct description.

Feature	Description
Amplitude	Length of one complete wave
Wavelength	The height of a wave
Frequency	A reflected sound wave
	Number of vibrations per second

[3]

(b) Complete the following sentences.

Choose from:

audible **ultrasound** **noise** **frequency**

Humans can hear sounds with a _____ between

20 Hz and 20 kHz. This is called the _____ range.

Unwanted sound or sound that is too loud is called _____ .

[3]

(c) Give two factors which can affect our hearing.

1. _____

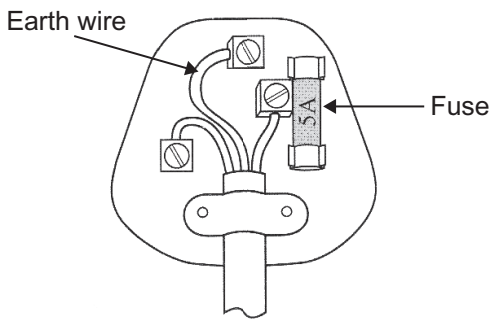
2. _____ [2]

(d) Suggest **one** way we can protect ourselves against hearing damage.

_____ [1]

3 The diagram below shows a plug used on an electrical appliance.

Examiner Only	
Marks	Remark



(a) Why has an earth wire been connected?

Choose from:

gives more power : for double insulation : for safety

_____ [1]

(b) Which of the following statements about fuses is **not** true?

A fuse breaks the circuit when there is a fault.
A fuse should be connected to the earth wire.
A fuse melts if the current becomes too high.

_____ [1]

(c) The plug has a 5 A fuse but the appliance uses a maximum of 6 A in normal use. Complete the following sentence.

Choose from:

too high : correct : too small

The value of the fuse is _____ [1]

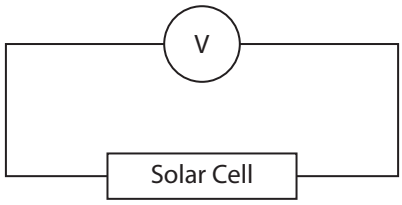
(d) Complete the table to give the missing name and colour of the wires inside the plug.

Name	Colour
Earth	Green + Yellow
Neutral	
	Brown

[2]

Examiner Only	
Marks	Remark

4 **(a)** To investigate the electricity produced by a solar cell pupils set up the following circuit.

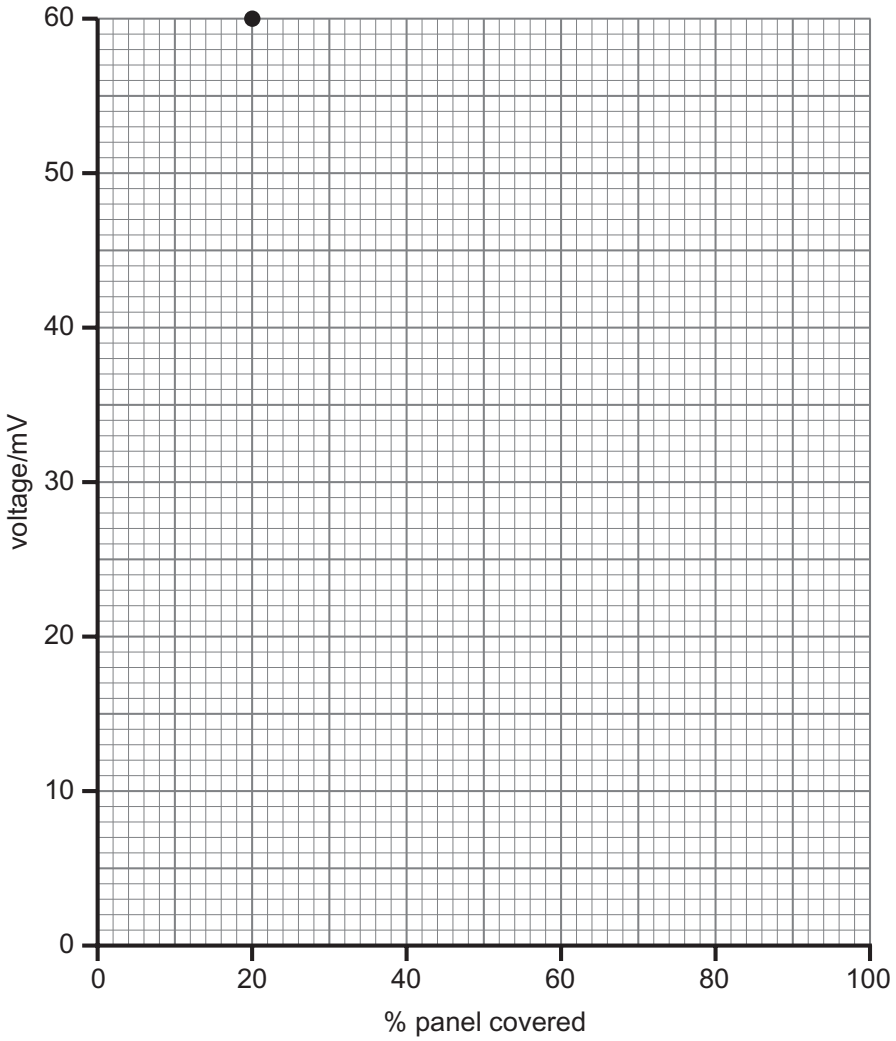


The circuit was taken outside and different percentages of the solar cell were covered in black paper.

The voltage was then recorded. The results are given below.

% panel covered	voltage/mV
20	60
40	45
60	30
80	15
100	0

(i) Complete the graph for these results on the grid below.



[2]

(ii) State a conclusion from this investigation.

_____

_____ [1]

(iii) When this experiment was carried out the next day by the same people using the same equipment a different set of results were found.
Explain fully what might have caused the results to be different.

_____

_____

_____ [2]

(b) Visible light is one part of the electromagnetic spectrum.

(i) Name another wave type from the electromagnetic spectrum.

_____ [1]

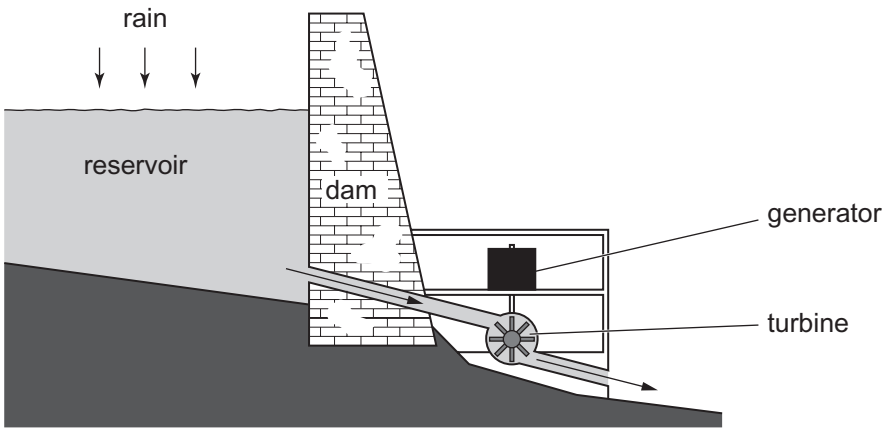
(ii) State **one** feature all electromagnetic waves have in common.

_____ [1]

Examiner Only	
Marks	Remark

5 The diagram below shows a hydroelectric power station.

Examiner Only	
Marks	Remark



(a) (i) Hydroelectric power is a renewable energy source.

Use the diagram and your knowledge to explain fully why hydroelectric power is a renewable energy source.

_____

_____

_____ [2]

(ii) Suggest **one** reason why hydroelectric power stations are usually built in mountainous areas.

_____ [1]

(iii) Name **two** other renewable energy sources.

_____ and _____ [1]

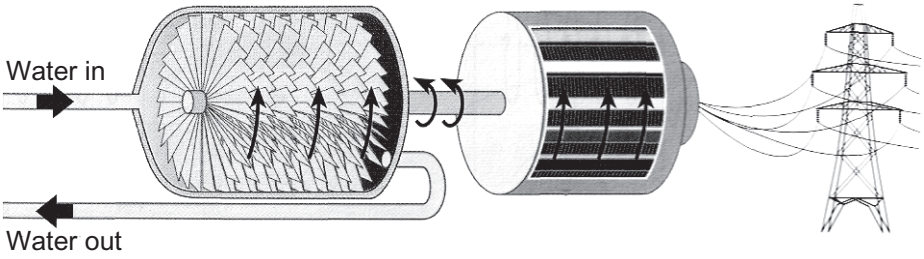
(b) Describe and explain **one** environmental disadvantage of using hydroelectric power stations.

_____

_____

_____ [2]

(c) The diagram below shows the operation of a turbine and generator.



Explain fully how the turbine and generator produce electricity.

_____

_____

_____

_____ [3]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

6 **(a)** The pictures below show a bathroom and a bedroom.

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© istockphoto/Thinkstock

Suggest why your voice will sound more powerful in the bathroom rather than the bedroom.

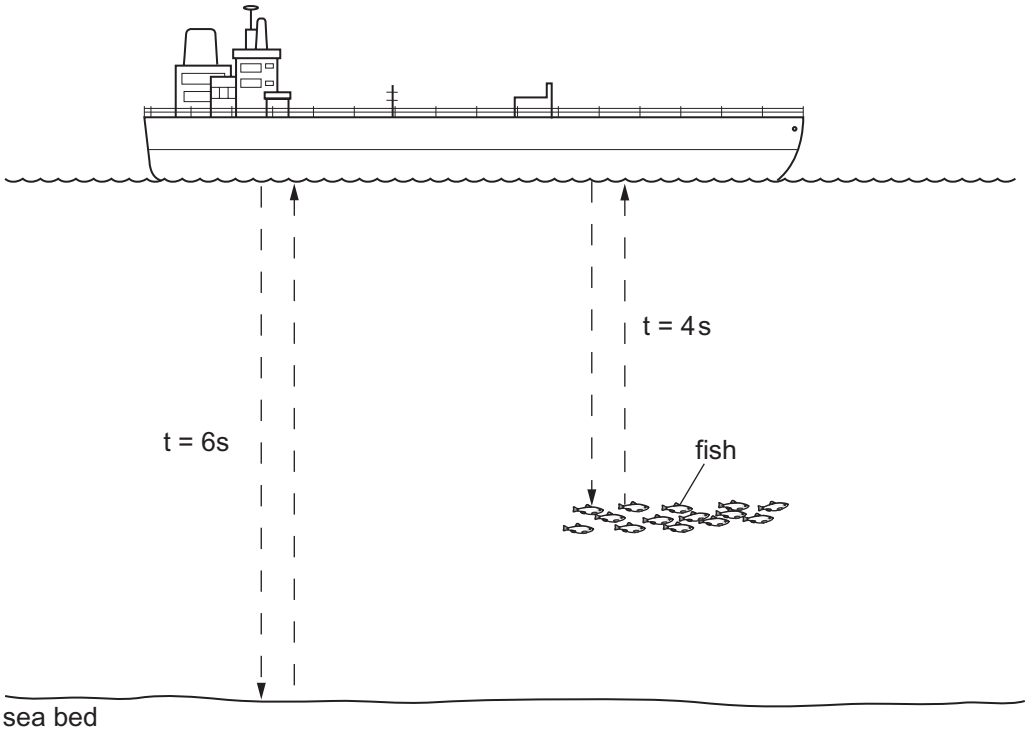
_____

_____

_____

_____ [3]

(b) Ultrasound can be used for both depth measurement and locating fish as shown in the diagram below.



The times shown on the diagram are the **return times** for the ultrasound and the speed of sound in water is 1500 m/s.

Use the equation:

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$

to calculate the height of the fish above the sea bed.

Answer _____ m [4]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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