



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]



THURSDAY 11 NOVEMBER 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.

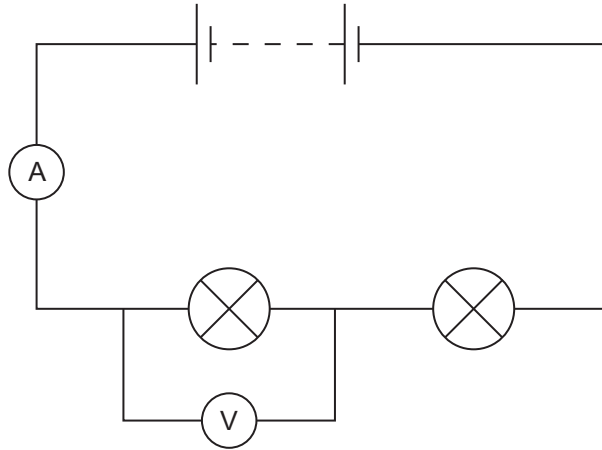
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Question Number	Marks
1	
2	
3	
4	
5	
6	

Total Marks



1 (a) Shown below is an electrical circuit with a fault.



(i) Complete the following sentences.

Choose from:

ammeter


parallel

volts

amps

series

voltmeter

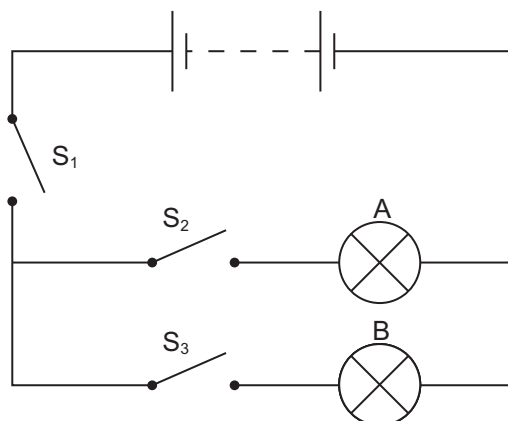
The symbol  represents a _____
 and is connected in _____ in the circuit above.
 It measures voltage in units called _____.
 In this circuit the bulbs are connected in _____. [4]

(ii) Explain why the bulbs would not light in the circuit shown above.

 _____ [2]

Examiner Only	
Marks	Remark

(b) The circuit below contains two identical bulbs (A and B).



(i) Which switches (S_1 , S_2 or S_3) should be closed so that **only** bulb B will be lit?

_____ and _____ [1]

(ii) If switch S_1 is closed and S_2 and S_3 are open, which bulb(s), if any, will be lit?

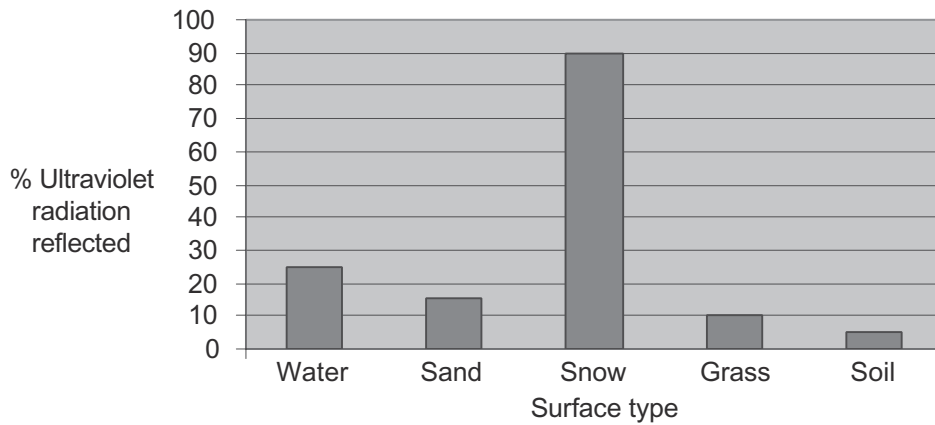
Choose from:

Bulb A : Bulb B : Both Bulbs A and B : None

_____ [1]

Examiner Only	
Marks	Remark

- 2 (a) The percentage of ultraviolet radiation **reflected** by different surfaces is shown in the bar chart below.



- (i) Which sportsperson will be exposed to the most reflected ultraviolet radiation?

Circle the correct answer.

golfer

skier

swimmer

[1]

- (ii) Name the disease caused by too much exposure to ultraviolet radiation.

_____ [1]

- (iii) Suggest **one** way that sportspeople can protect themselves from ultraviolet radiation.

 _____ [1]

Examiner Only	
Marks	Remark

(b) (i) Given below are types of electromagnetic radiation and some uses. Using lines link each type to **one** common use.

Type	Use
Gamma rays	Cancer treatment
Visible light	Remote controls
Microwaves	Cooking
	Photography

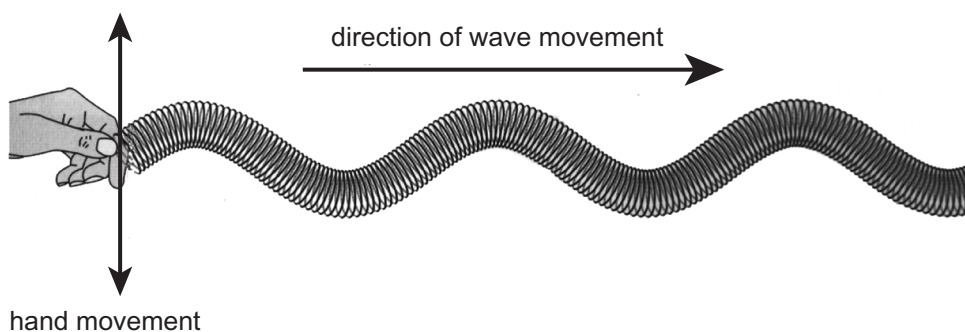
[3]

(ii) Name a type of electromagnetic radiation used in mobile phone communications.

_____ [1]

Examiner Only	
Marks	Remark

- 3 (a) The diagram below represents a wave. It is made by moving a slinky spring up and down as shown.



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

_____ [1]

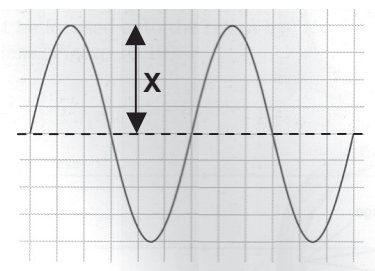
- (ii) Complete the following sentence.

Choose from:

energy **reflections** **pictures** **vibrations**

All waves are caused by _____ and they carry
 _____ from one place to another. [2]

- (iii) What name is given to the height labelled **X** shown on the wave below?



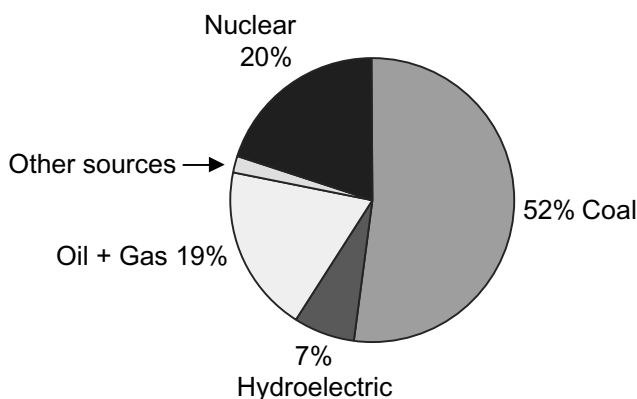
Choose from:

wavelength **amplitude** **frequency**

_____ [1]

Examiner Only	
Marks	Remark

- 4 The pie chart below shows the percentage of electricity generated from various energy sources.



- (a) (i) Calculate the percentage of electricity produced from other sources.

Show your working out.

Answer _____% [2]

- (ii) Apart from hydroelectric, name one other renewable source.

_____ [1]

- (iii) Explain the meaning of the term **renewable source**.

_____ [1]

- (iv) Give **one** environmental advantage to using renewable sources.

_____ [1]

- (b) The cost of lighting an average house is £150 each year. Give two ways that the cost of lighting could be reduced.

1. _____ [1]

2. _____ [1]

Examiner Only	
Marks	Remark

- 5 (a) A charity wanted to build a water pump in a remote desert area of Africa. They had the choice of a petrol generated or solar powered pump. Explain fully why they considered the solar powered pump the better choice.

[3]

- (b) The water pump has a power rating of 1 kW and a voltage of 250 V. Calculate the current flowing in the lead connecting the water pump to the generator.

Use the equation:

$$\text{Current} = \frac{\text{Power}}{\text{Voltage}}$$

Answer _____ A [3]

Examiner Only	
Marks	Remark

- 6 In an experiment on hearing, different frequencies were played to 20 teenagers and 20 pensioners. The number who could hear each frequency was recorded. The results are shown in the table below.

Frequency (kHz)	Number who could hear each frequency	
	Teenagers	Pensioners
12	20	20
14	20	18
16	20	15
18	20	12
20	20	0
22	0	0

- (a) (i) Describe fully what the information in the table tells us about hearing in teenagers.

[2]

- (ii) What name is given to sounds above 20kHz?

[1]

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Marks Remark

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