Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2010–2011

Science: Single Award (Modular)

Road Safety, Radioactivity and Earth in Space
Module 6
Foundation Tier

[GSC61]

GSC61

FRIDAY 20 MAY 2011, 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	

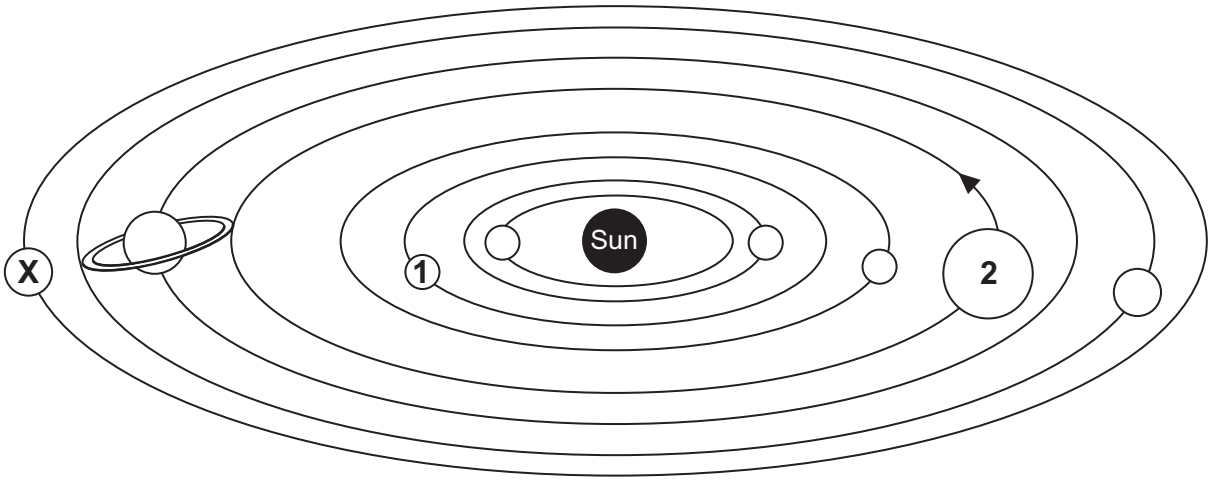
Examiner Only	
Marks	Remark

1 **(a)** Given below are names and descriptions used in the study of space. Using lines match each name to its correct description.

Name	Description
Milky Way	A galaxy
Sun	A planet
Uranus	A star

[2]

(b) The diagram below shows the Sun and its planets.



(i) Name the planet labelled X.

_____ [1]

(ii) The movement of planet **2** is shown on the diagram with an arrow. Mark on the diagram the movement of planet **1**. [1]

(c) Complete the following sentences.

Choose from:

Earth : Moon : Solar System : Galaxy

The Sun and its planets are known as the _____.

Many centuries ago the Ancient Greeks believed that the _____ was at the centre of the Universe. [2]

(d) The photograph below shows a radio telescope at Jodrell Bank.

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The telescope is searching for radio signals from extra-terrestrial life forms.

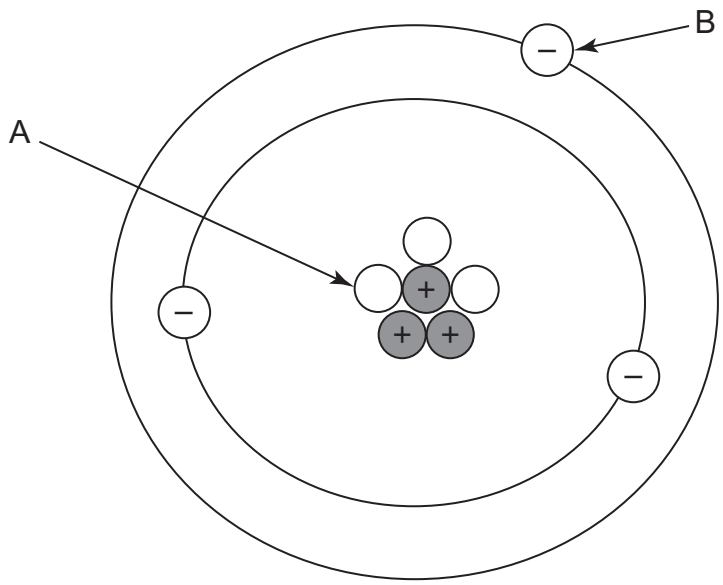
Explain what is meant by the term **extra-terrestrial life**.

_____ [1]

Examiner Only

Marks	Remark

2 The diagram below shows the structure of an atom.



(a) Name the particles labelled A and B.

Choose from:

electron : nucleus : proton : neutron

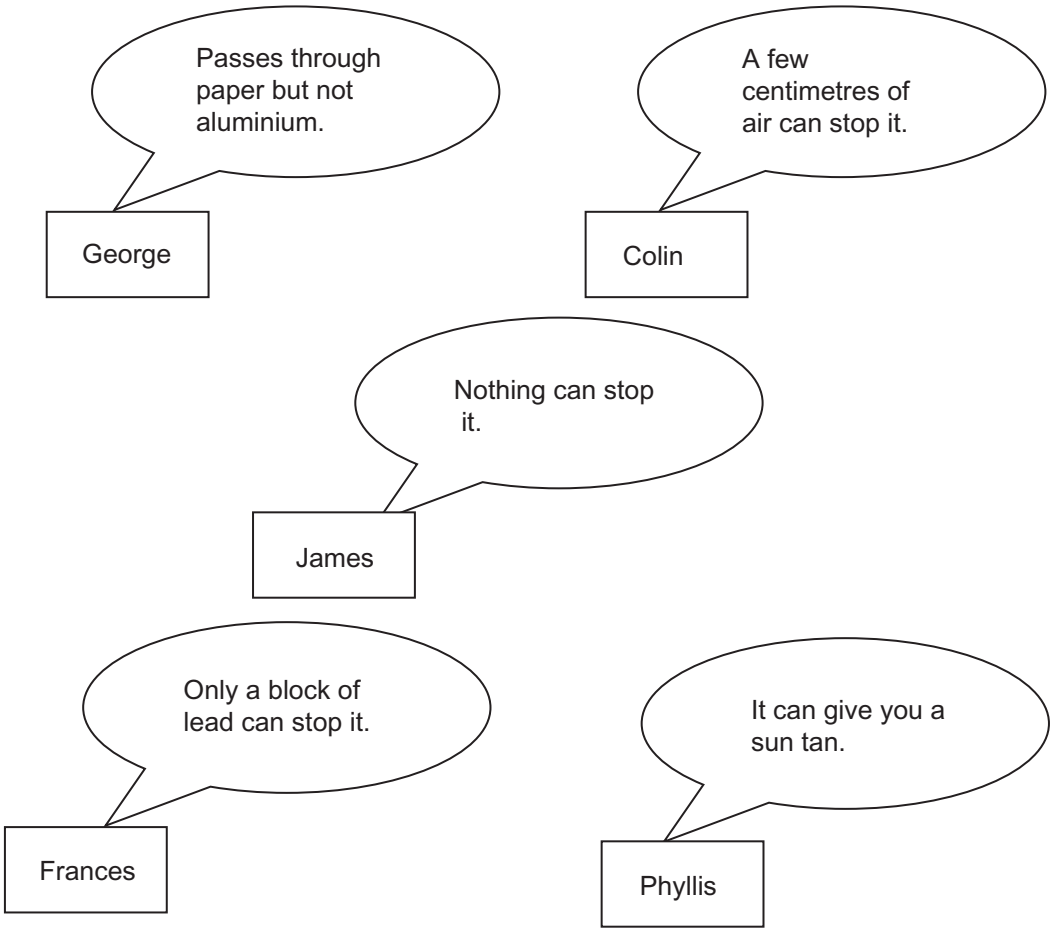
A _____

B _____

[2]

Examiner Only	
Marks	Remark

(b) The speech bubbles below show five answers given by students when asked about radiation.



Name the student who gave the correct answer for:

(i) gamma radiation _____.

(ii) alpha radiation _____.

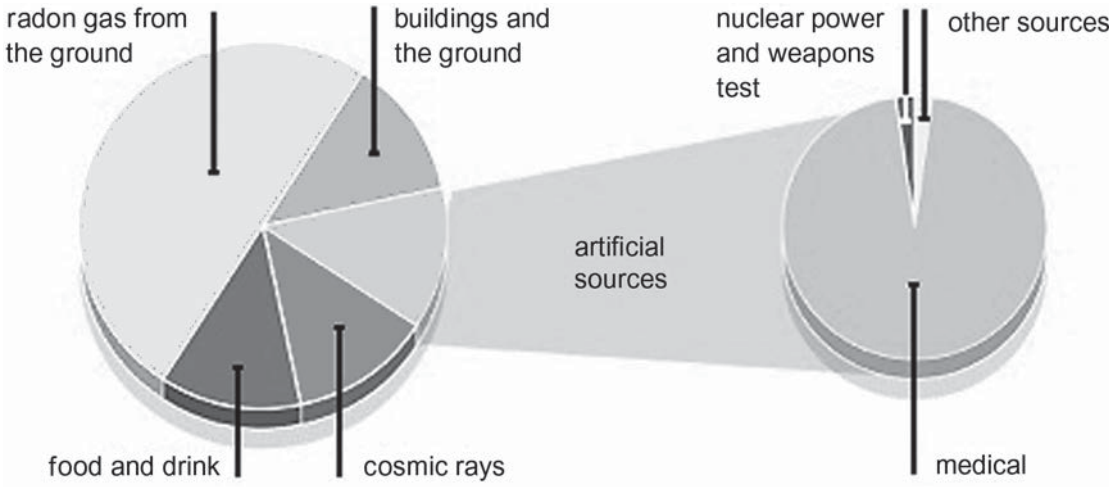
(iii) beta radiation _____.

[3]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

(c) The pie charts below show some sources of radiation in the atmosphere.



© BBC Bitesize http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa/radiation/backgroundradiationrev2.shtml

(i) Name the biggest source of radiation in the atmosphere.

_____ [1]

(ii) Name one source of radiation caused by humans.

_____ [1]

(iii) Complete the following sentence.

Choose from:

background : foreground : surround

The small amount of radiation always in the atmosphere is called

_____ radiation. [1]

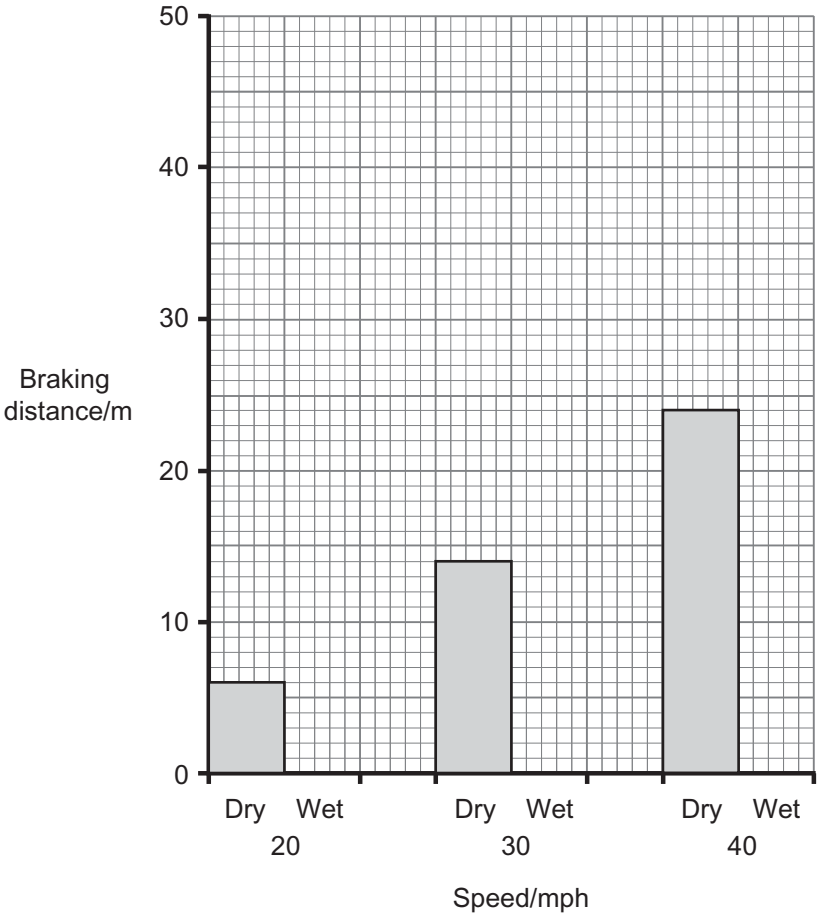
(d) Give **one** harmful effect of radiation.

_____ [1]

3 **(a)** The information below shows the braking distance in wet and dry conditions at different speeds.

Speed/mph	Braking distance/m	
	dry	wet
20	6	12
30	14	27
40	24	49

(i) Complete the bar chart below to show the braking distance in **wet** conditions.



[2]

(ii) Use the information to state how the braking distance changes when it rains.

_____ [1]

(iii) In what way, if any, does a wet road affect the thinking distance?

_____ [1]

(b) During a car crash the driver's head can hit the steering wheel, causing serious injury. Name two safety features which prevent the driver's head from hitting the steering wheel.

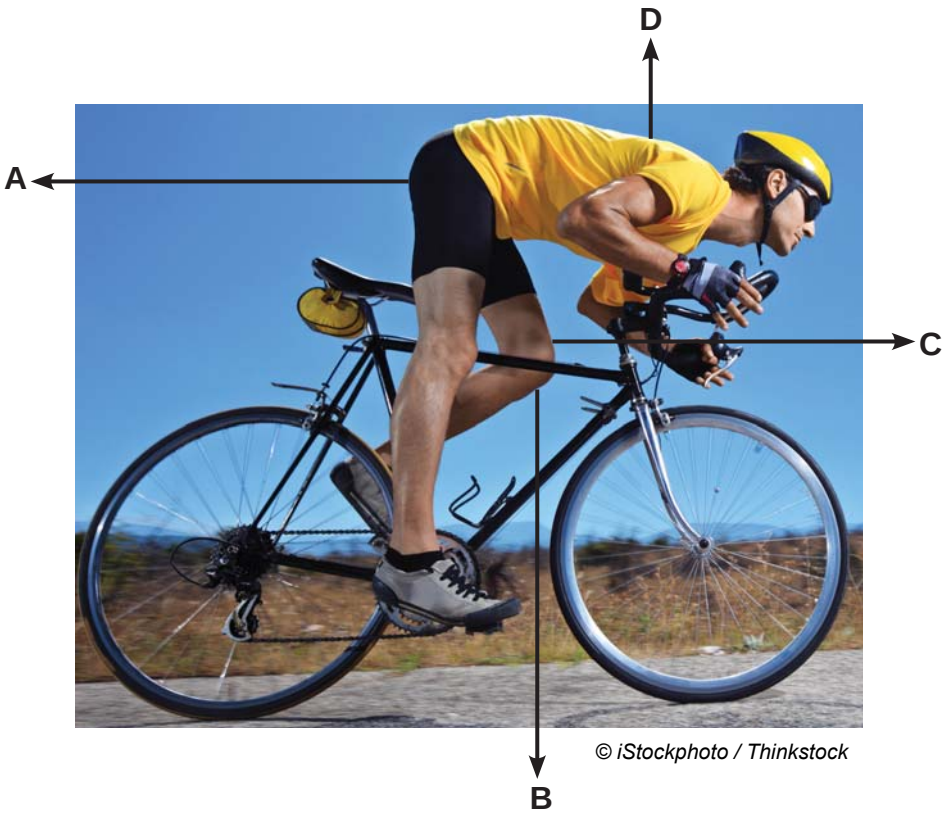
1. _____

2. _____ [2]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

4 **(a)** The diagram below shows four forces acting on a moving cyclist.



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(i) Which letter (**A**, **B**, **C** or **D**) represents the cyclist's weight?

_____ [1]

(ii) Which letter (**A**, **B**, **C** or **D**) represents the friction on the cyclist?

_____ [1]

(iii) If force **A** is equal to force **C** describe the motion of the cyclist.

_____ [1]

(b) The table below describes the frictional forces that act when a bicycle is ridden. Friction can be **useful** or be a **nuisance**. Complete the table below by writing either useful or nuisance for each description.

Description	Useful or Nuisance
Friction on the rider from air	
Friction on the wheel rim when using the brakes	
Friction on the feet from the pedals	
Friction on the tyre from the road	

[2]

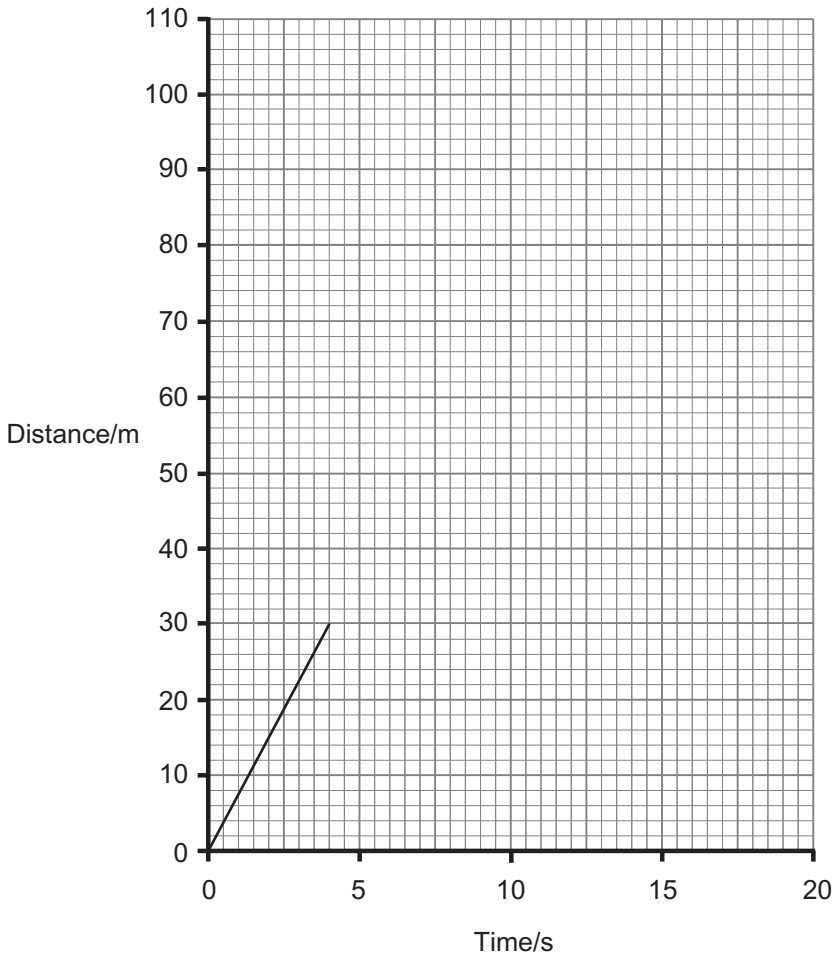
Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

(c) A cyclist travels 30 m in 4 seconds.

He then stops for 6 seconds.

After stopping, he then travels a further 70 m in 10 seconds.



(i) Complete the distance–time graph using the information above. [2]

(ii) Calculate the speed of the cyclist over the first 4 seconds using the equation:

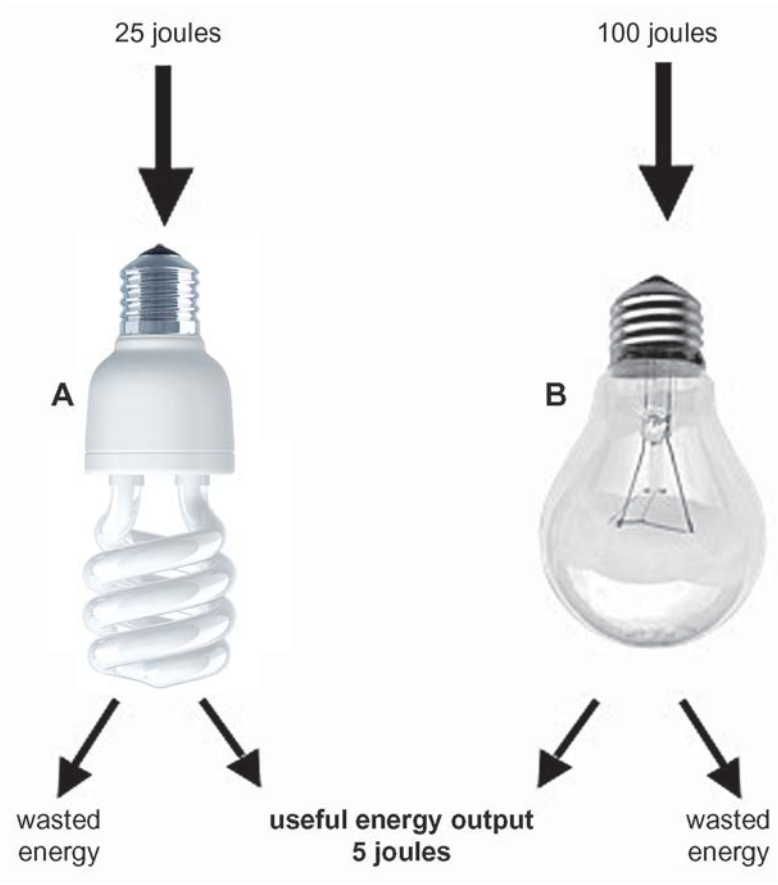
$$\text{speed} = \frac{\text{distance}}{\text{time}}$$

Show your working out.

_____ m/s [2]

Examiner Only	
Marks	Remark

5 The diagram below shows the amount of electrical energy put into two types of lamp (**A** and **B**) to produce 5 joules of useful light energy per second.



(a) Name the type of energy wasted by the lamps.

_____ [1]

(b) **(i)** What is meant by the term efficiency?

_____

_____ [1]

(ii) Use the equation:

$$\text{efficiency} = \frac{\text{useful energy output}}{\text{total energy input}}$$

to calculate the efficiency of **lamp A**.

Show your working out.

Efficiency = _____ [2]

(c) Use the information and your knowledge to explain fully how the use of lamp A compared to lamp B can help the environment.

_____

_____

_____

_____

_____ [3]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

6 It is important that scientists try to work out how much fossil fuel remains in the world. Below are four statements about coal and oil reserves.

- In 2010 there was estimated to be 181 billion tonnes of oil left
- In 2010 there was estimated to be 847 billion tonnes of coal left
- The world supply of coal will last for approximately 119 years
- The world supply of oil will last for approximately 47 years

(a) **(i)** Use the information to estimate in what year the world supply of coal will run out.

_____ [1]

(ii) Suggest **two** reasons why it is difficult to predict how long reserves of coal and oil will last.

_____

_____

_____ [2]

(b) In the Ballymoney area there is estimated to be 700 million tonnes of lignite.

(i) Suggest **one** reason why it might be an advantage to mine lignite in this area.

_____

_____ [1]

(ii) Give **one** disadvantage of mining lignite in the Ballymoney area.

_____

_____ [1]

(c) Explain fully how fossil fuels are formed.

_____

_____

_____ [2]

THIS IS THE END OF THE QUESTION PAPER

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