

Centre Number			
71			
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Candidate	Number
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General Certificate of Secondary Education 2010–2011

Science: Single Award (Modular)

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

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Marks	



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

Examiner Only			
Marks Remark			

Name

Milky Way

Sun

Uranus

Description

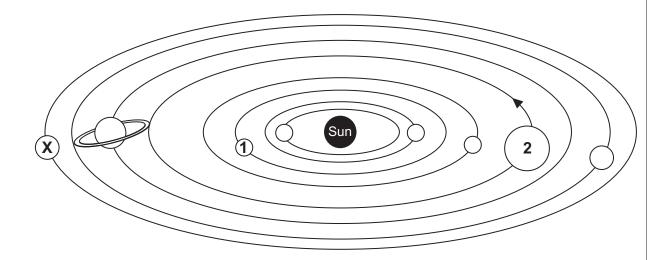
A galaxy

A planet

A star

[2]

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



(i) Name the planet labelled X.

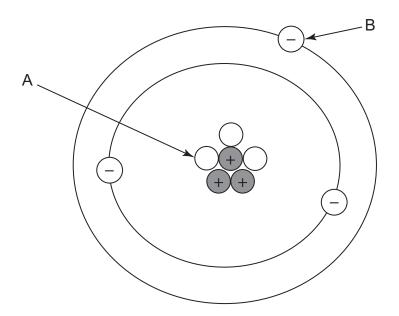
[1]

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

2

(c)		r Only Remark
	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.	
	© iStockphoto / Thinkstock	
	The telescope is searching for radio signals from extra-terrestrial life forms.	
	Explain what is meant by the term extra-terrestrial life .	
	[1]	

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

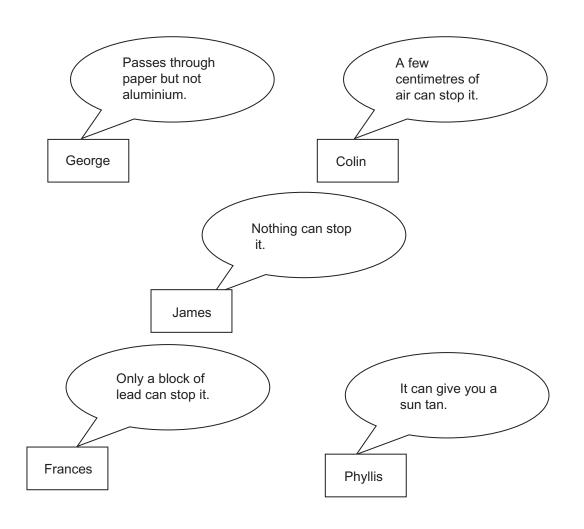
В _____

[2]

Examiner Only

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





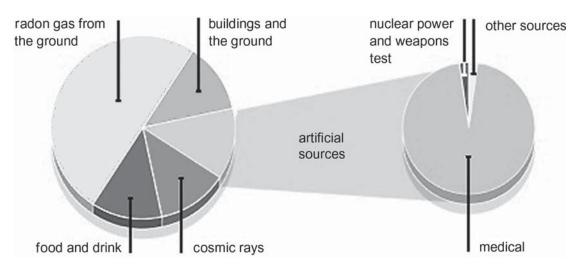
Name the student who gave the correct answer for:

- (i) gamma radiation ______.
- (ii) alpha radiation
- (iii) beta radiation ______.

[3]

(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]
		נין

(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]

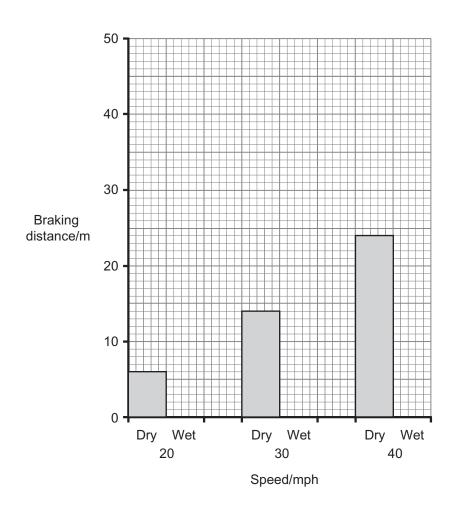
(d) Give one harmful effect of radiation.

______[1]

6

Spood/mph	Braking distance/m			
Speed/mph	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.

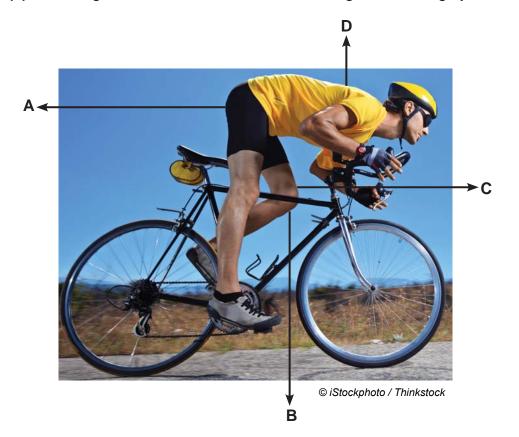
_____[1]

	(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.	21

Examiner Only

Marks Remark

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



(i)	Which	letter (A,	${f B},{f C}$ or	D) repre	esents the	cyclist's	weight?
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_____[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]

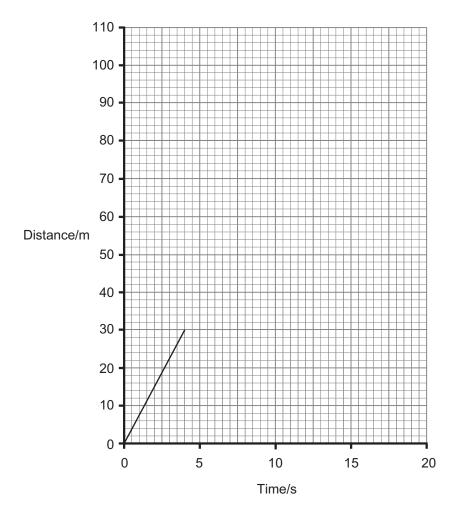
Marks Remark

Examiner Only

	(c)	A cyclist	travels	30 m	in	4	seconds
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He then stops for 6 seconds.

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



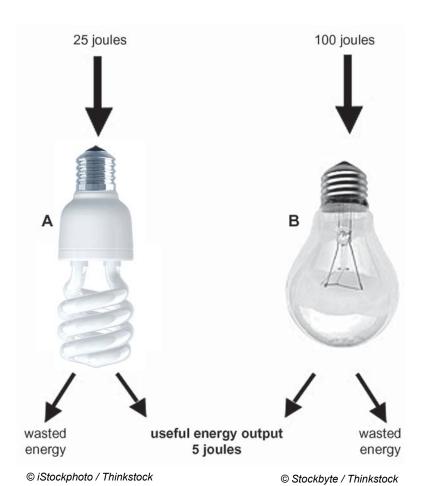
- (i) Complete the distance—time graph using the information above. [2]
- (ii) Calculate the speed of the cyclist over the first 4 seconds using the equation:

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

Show your working out.

m/s [2]

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.



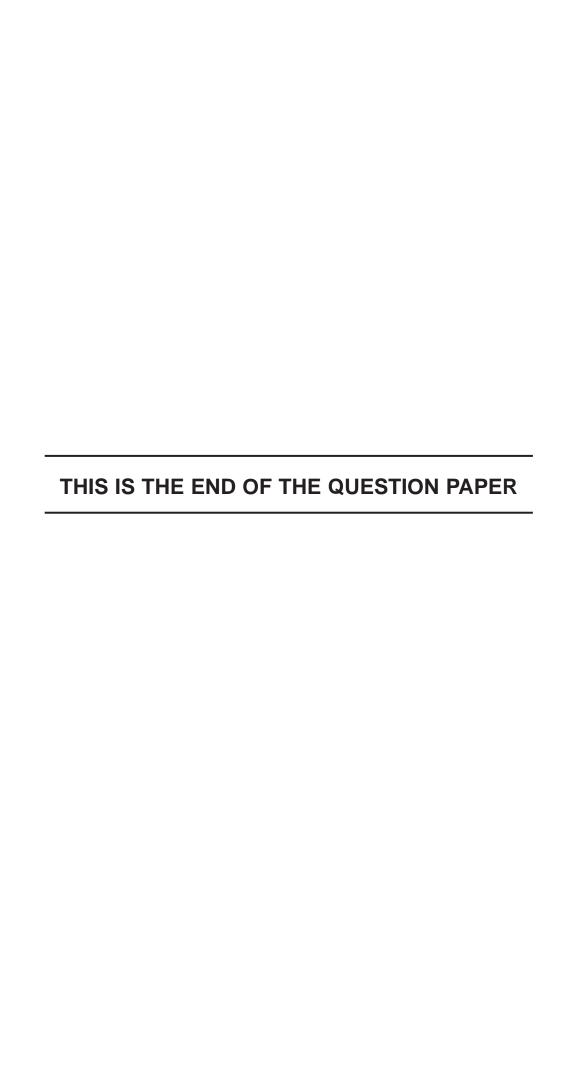
(a) Name the type of energy wasted by the lamps.

_____[1]

Examiner Only Marks Remark

(b)	(i)	What is meant by the term efficiency?	Examiner Only Marks Remar
			[1]
	(ii)	Use the equation:	
		$efficiency = \frac{useful \ energy \ output}{total \ energy \ input}$	
		to calculate the efficiency of lamp A.	
		Show your working out.	
		Efficiency =	[2]
(c)		e the information and your knowledge to explain fully how the us amp A compared to lamp B can help the environment.	e
			_
			_
			[3]

	ortant that scientists try to work out how much fossil fuel remains orld. Below are four statements about coal and oil reserves.	Examiner Only Marks Remark
☐ In 201☐ The w	0 there was estimated to be 181 billion tonnes of oil left 0 there was estimated to be 847 billion tonnes of coal left orld supply of coal will last for approximately 119 years orld supply of oil will last for approximately 47 years	
	Use the information to estimate in what year the world supply of coal will run out.	
		[1]
	Suggest two reasons why it is difficult to predict how long reserves of coal and oil will last.	
		-
		[2]
(b) In th	ne Ballymoney area there is estimated to be 700 million tonnes of te.	of
• • •	Suggest one reason why it might be an advantage to mine light in this area.	te
		_ [1]
(ii)	Give one disadvantage of mining lignite in the Ballymoney area	
		[1]
(c) Expl	lain fully how fossil fuels are formed.	
		_
		[2]



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