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 25 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.

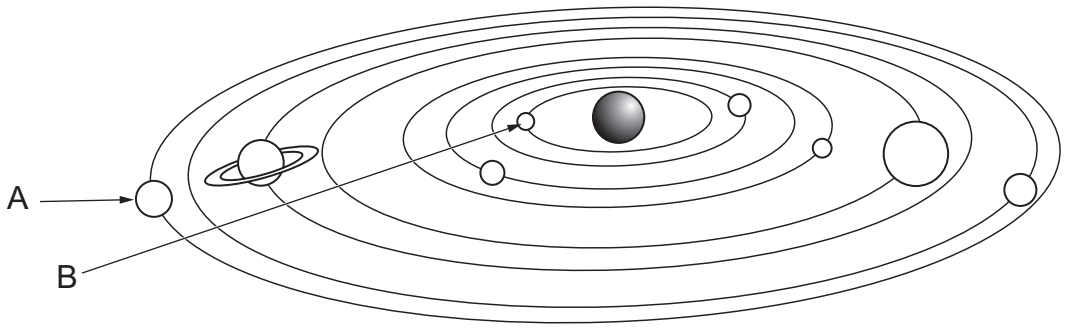
INFORMATION FOR CANDIDATES

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 diagram below shows the Sun and its eight planets.



(a) (i) What name is given to the Sun and its eight planets?

_____ [1]

(ii) Name the planets labelled A and B.

A is _____

B is _____ [2]

(b) Complete the following sentences.

Choose from:

Universe : Milky Way : Same

Opposite : Orbit : Square

Each planet moves in an _____ around the Sun. All the planets go round the Sun in the _____ direction. Our Sun and its planets are part of a galaxy called the _____. [3]

(c) The photograph below shows the Barringer crater in Arizona.

Examiner Only	
Marks	Remark

© NASA http://rst.gsfc.nasa.gov/Sect18/Barringercrater.jpg

(i) Name the type of object which collided with Earth to make a crater like this.

_____ [1]

(ii) What might happen to plants and animals if a similar object was to collide with the Earth in the future?

_____ [1]

Examiner Only

Marks	Remark

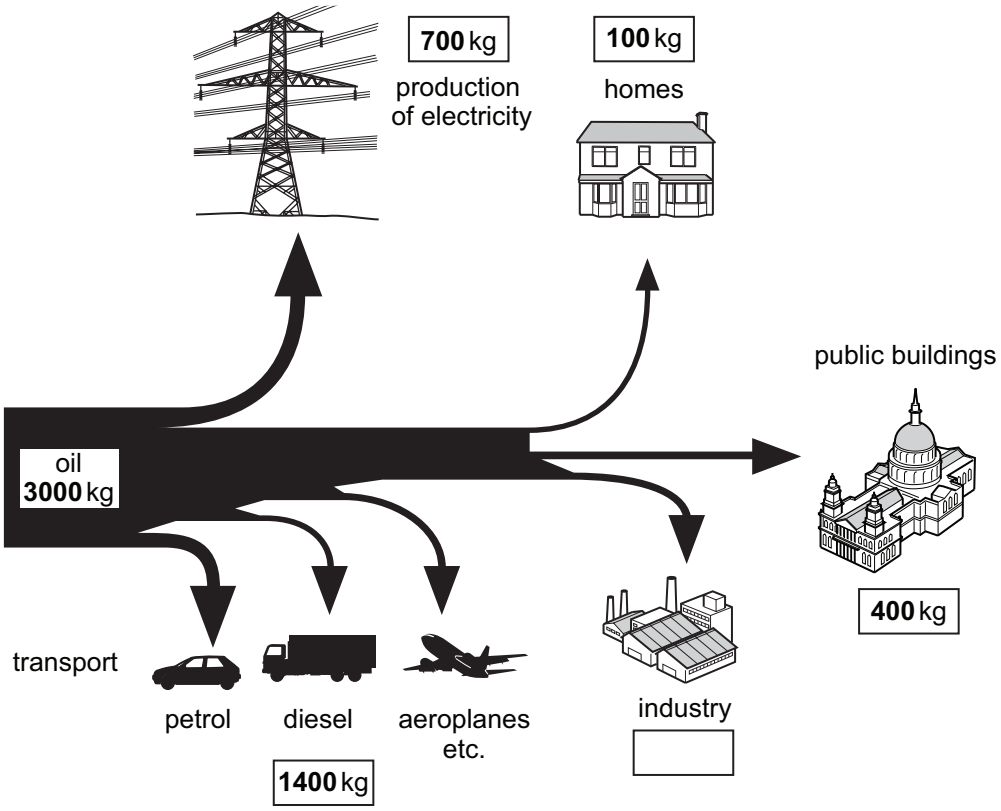
2 **(a)** The statements below describe how fossil fuels are made.

A	become buried by sediment
B	remain for millions of years
C	plants and animals die

Using the letters **A, B and C** put the statements in the correct order for producing fossil fuels.

_____ _____ _____ [1]

(b) The diagram shows how 3000 kg of oil is used in a small town.



Use the diagram to calculate how many kilograms of oil were used in industry.

Show your working out.

_____ kg [2]

(c) Oil is a fossil fuel. Name another fossil fuel.

_____ [1]

(d) Name a fossil fuel found in large amounts in Northern Ireland.

_____ [1]

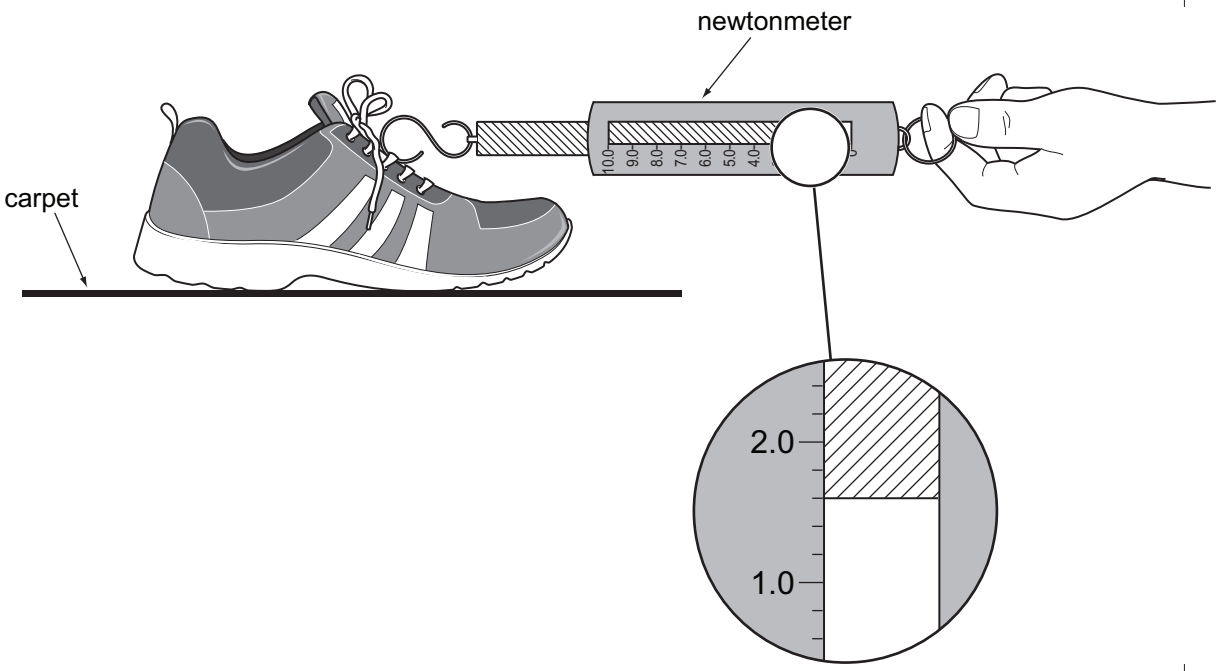
(e) Why is it important to develop alternatives for fossil fuels?

_____ [1]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

3 Lynda carried out an experiment to find out how the sole of a sports shoe affected its grip on different surfaces.



(a) (i) What is the reading on the newtonmeter?

_____ N [1]

(ii) Name the force which makes it difficult to move the shoes in this experiment.

_____ [1]

These are Lynda's results.

Type of shoe	Force needed to move shoe / N		
	Carpet	Wooden floor	Sand
Rugby boot	1.4	0.2	1.5
Running shoe	1.6	0.1	1.7
Tennis shoe	1.0	0.7	0.9
Trainers	0.9	0.6	0.8

(b) The game of squash is played on wooden floors and involves a lot of movement and changing direction. Suggest which shoe type would be best to wear when playing squash and explain your choice.

_____

_____

_____ [2]

Examiner Only	
Marks	Remark

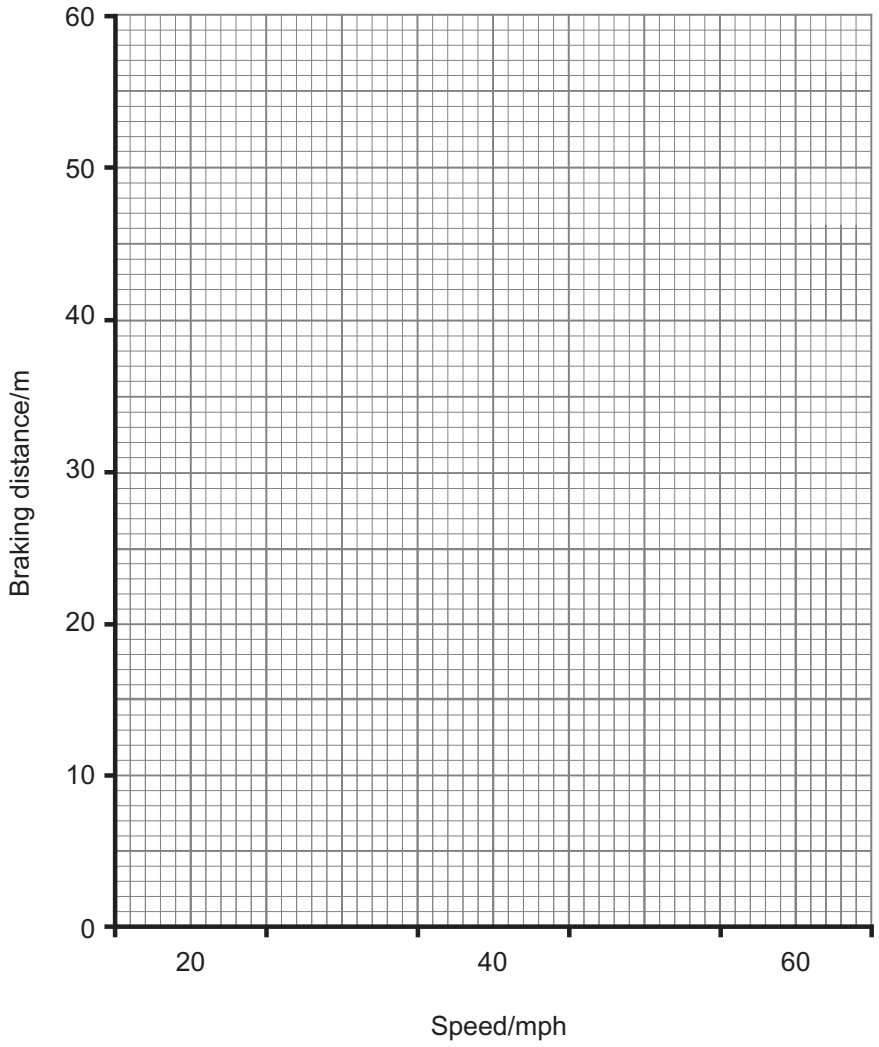
4 The table below shows both the thinking and braking distance at different speeds. The tests were carried out on a dry day.

Speed/mph	Thinking distance/m	Braking distance/m
60	18	55
40	12	24
20	6	6

(a) (i) Calculate the stopping distance at 40 mph.

_____ m [1]

(ii) Draw a bar chart for **braking distance** on the grid below.



[2]

Examiner Only

Marks	Remark

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Marks	Remark

(iii) What difference, if any, would you expect in the **thinking distance** if the test had been carried out on a wet day?

Choose from:

no effect : a decrease : an increase

_____ [1]

(b) The diagram below shows how crash test dummies are used to test the safety of cars.

Use the diagram and your knowledge to name two safety features in a car and explain why they reduce injury.

Name_____

Explanation _____ [2]

Name_____

Explanation _____ [2]

(c) State two ways in which pedestrians can reduce the risk of being knocked down by a car.

1. _____

2. _____ [2]

(d) Explain fully how speed-bumps can help improve road safety for pedestrians.

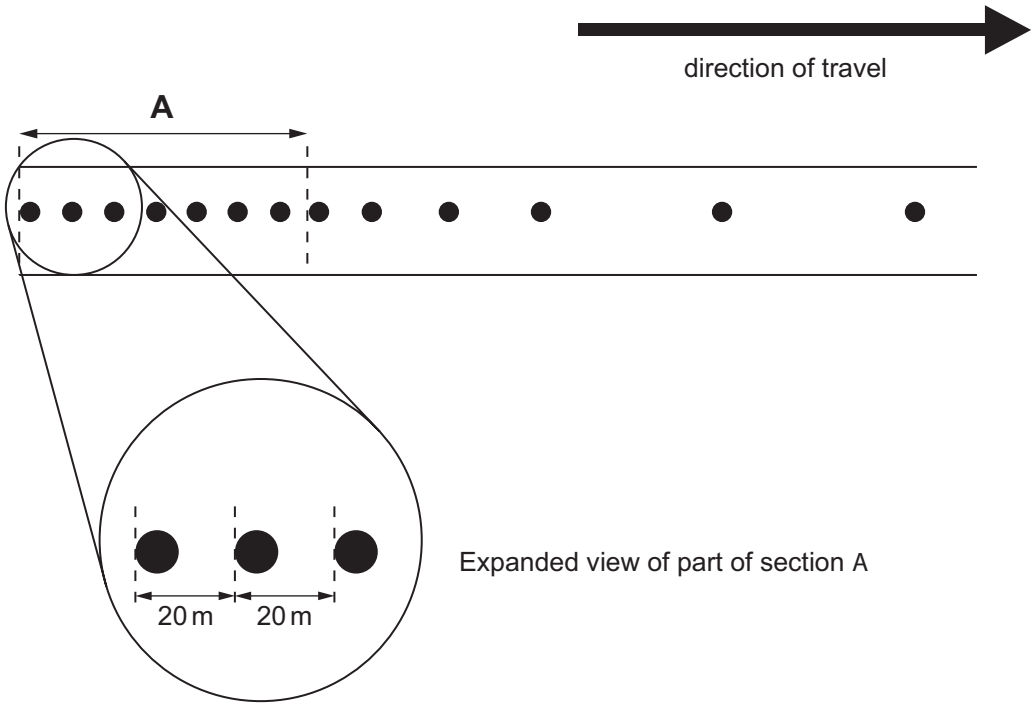
_____

_____

_____ [2]

Examiner Only	
Marks	Remark

5 An oil tanker is leaking oil. The drops of oil hit the ground at a regular time interval of 2 seconds as shown in the diagram below.



Expanded view of part of section A

(a) In section **A** all the oil drops are 20 m apart.

Use the equation:

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

to calculate the speed of the tanker in section **A**.

Speed = _____ m/s [2]

(b) Is the speed of the oil tanker increasing, decreasing, or staying the same over the entire journey? Explain your answer.

_____

_____

_____ [2]

Examiner Only

Marks	Remark

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Marks	Remark

6 Radon is a naturally occurring radioactive gas. The table below shows the levels of radon in different council areas.

Council area	Number of houses tested	Highest radon concentration level/ Bq/m^3
Carrickfergus	30	62
Down	3950	38
Derry	1343	4900
Newtownabbey	75	130
Fermanagh	549	3900

(a) Radon gas is a source of background radiation. What is meant by the term **background radiation**?

_____

_____ [1]

(b) Explain fully why a nucleus may be radioactive.

_____

_____ [2]

(c) **(i)** Use the information in the table to suggest how the results for Carrickfergus could be made more reliable.

_____ [1]

(ii) The government has set an action level of **200 Bq/m^3**. Below this level there is little harm done to humans. Name the council areas which have high enough levels of radon to damage humans.

_____ [1]

(iii) Explain fully how radioactive radon can harm humans.

_____

_____

_____ [2]

(d) You have been given a radioactive sample. You are provided with sheets of aluminium, paper and lead. You also have a radiation counter.

Describe a simple experiment to show which type of radiation (alpha, beta or gamma) is emitted. Include in your answer one way to keep your results valid.

_____

_____

_____

_____

_____

_____ [4]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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