Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2012

Science: Single Award (Modular)

Road Safety, Radioactivity and Earth in Space Module 6

Foundation Tier

[GSC61]

GSC61

WEDNESDAY 14 NOVEMBER 2012, 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.

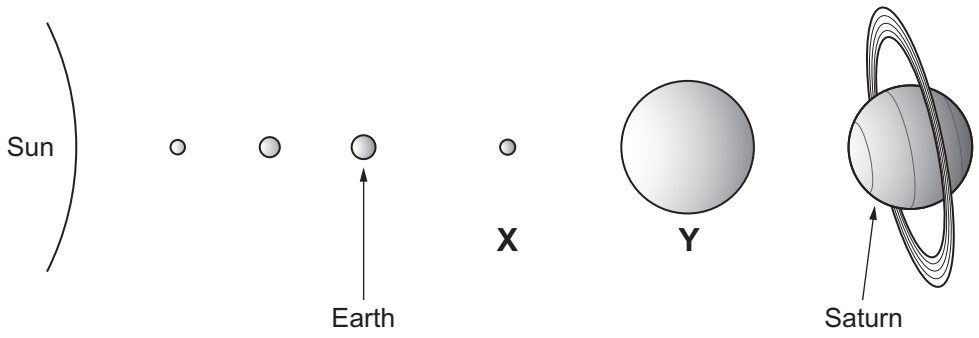
INFORMATION FOR CANDIDATES

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)** The diagram below shows part of our Solar System.



Name the **two** planets **X** and **Y** between the Earth and Saturn.

X _____

Y _____ [2]

(b) Complete the sentences below.

Choose from:

fission **pulled** **fusion**

pushed **nitrogen** **hydrogen**

Our Sun is a star. It is made of a gas called _____.

This gas is _____ together by gravity, producing

energy in a process called nuclear _____. [3]

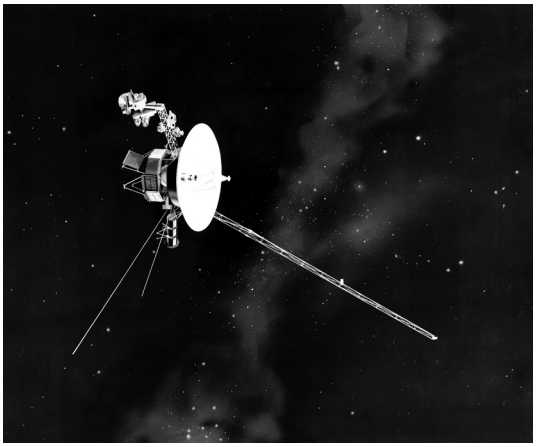
(c) The table below shows the strength of gravity on some planets from our Solar System.

Planet	Strength of gravity N/kg
A	4
B	9
C	10
D	4
E	26

On which planet **A**, **B**, **C**, **D** or **E** would your weight be the biggest?

_____ [1]

(d) The photograph below shows Voyager 1. It was launched in 1977 to search for life on other planets.



What name is given to life which may be found on other planets?

_____ [1]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

2 **(a)** Below are some statements. Which **two**, **A**, **B**, **C**, **D** or **E**, are correct for fossil fuels?

A They take hundreds of years to make.

B They do not increase global warming when burnt.

C They take millions of years to make.

D They are made from the remains of plants and animals.

E They will last forever.

_____ and _____ [2]

(b) Lignite is a fossil fuel found in Northern Ireland.
Suggest **one** advantage and **one** disadvantage of lignite mining for people who live in the local community.

Advantage

_____

_____

Disadvantage

_____

_____ [2]

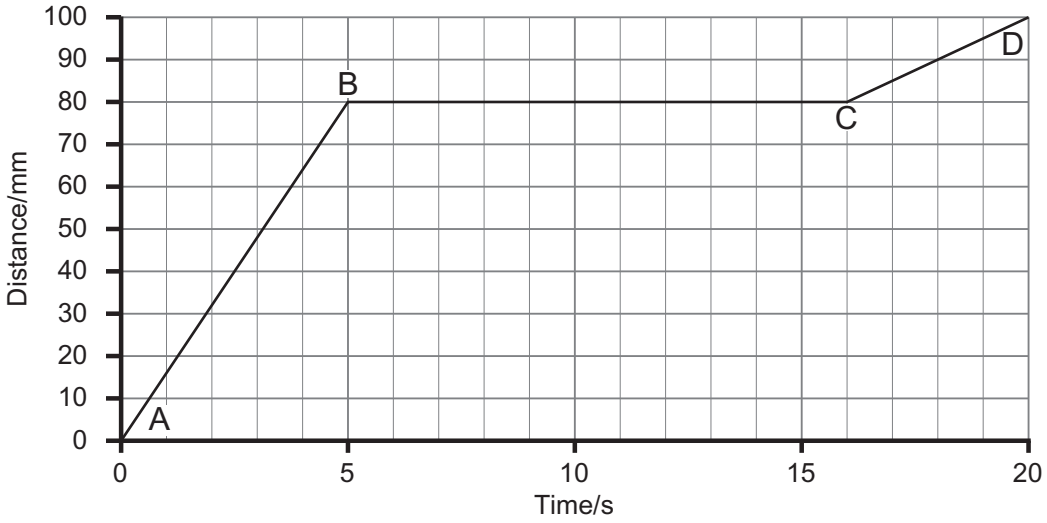
(c) Name **two** other fossil fuels apart from lignite.

1. _____

2. _____ [2]

Examiner Only	
Marks	Remark

3 **(a)** Shown below is a distance–time graph for a caterpillar crawling across a leaf.



(i) Describe the motion of the caterpillar from A to B.

Choose from:

stopped : steady speed : accelerating

_____ [1]

(ii) During which part of the journey is the caterpillar crawling at the fastest speed?

Choose from:

A to **B** : **B** to **C** : **C** to **D**

_____ [1]

(iii) Use the equation:

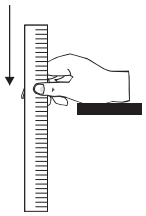
$$\textbf{average speed} = \frac{\textbf{total distance}}{\textbf{total time}}$$

to calculate the average speed of the caterpillar from **A** to **D**.
(Show your working out.)

_____ mm/s [2]

Examiner Only	
Marks	Remark

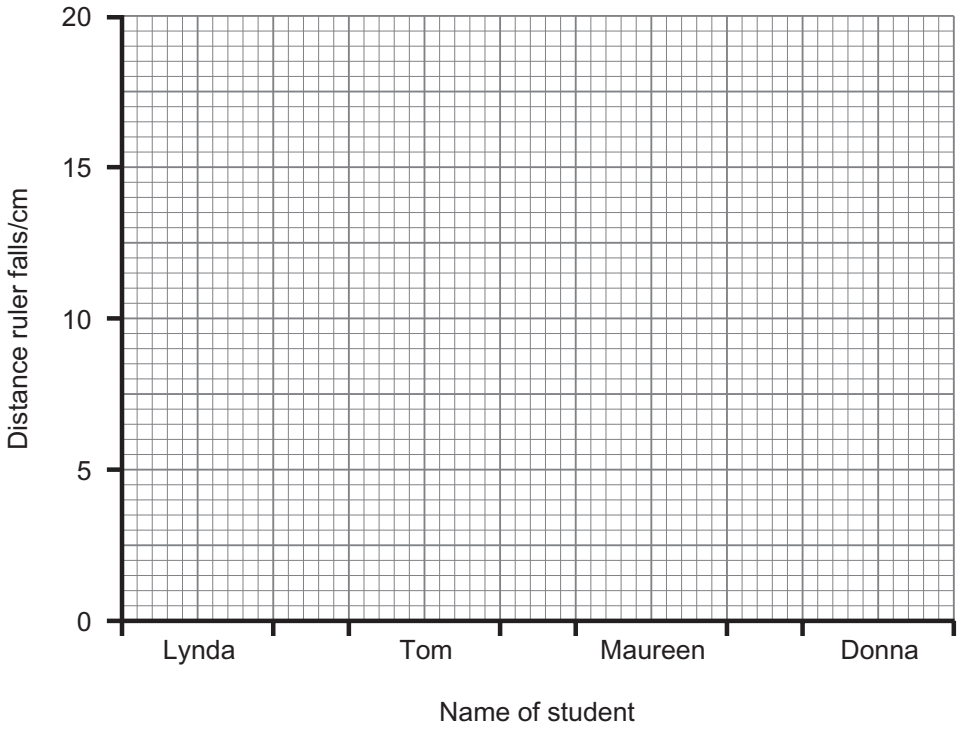
(b) Quick reactions are very important when driving a car. The simple experiment shown below can test reactions by catching a falling ruler.



The results for four students are shown below.

Name of student	Distance ruler falls/cm
Lynda	20
Tom	10
Maureen	14
Donna	8

(i) Draw a **bar graph** of their results on the grid below.



[2]

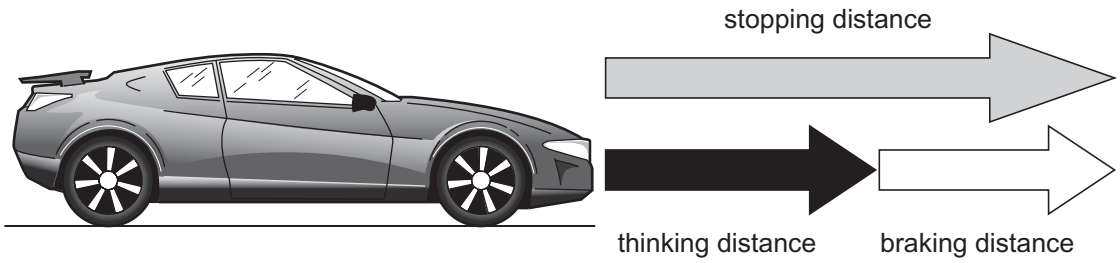
(ii) Name the student with the fastest reactions.

_____ [1]

Examiner Only

Marks	Remark

(c) The stopping distance of a car can be calculated by adding the thinking distance to the braking distance.



Use this information to complete the table below.

Speed/mph	Thinking distance/m	Braking distance/m	Stopping distance/m
20	6	6	12
30	9	14	
40		24	36
50	15	38	53

[2]

(d) The photograph below shows a brake from a car. Brakes rubbing against the wheel stop the car.

Source: Principal Examiner

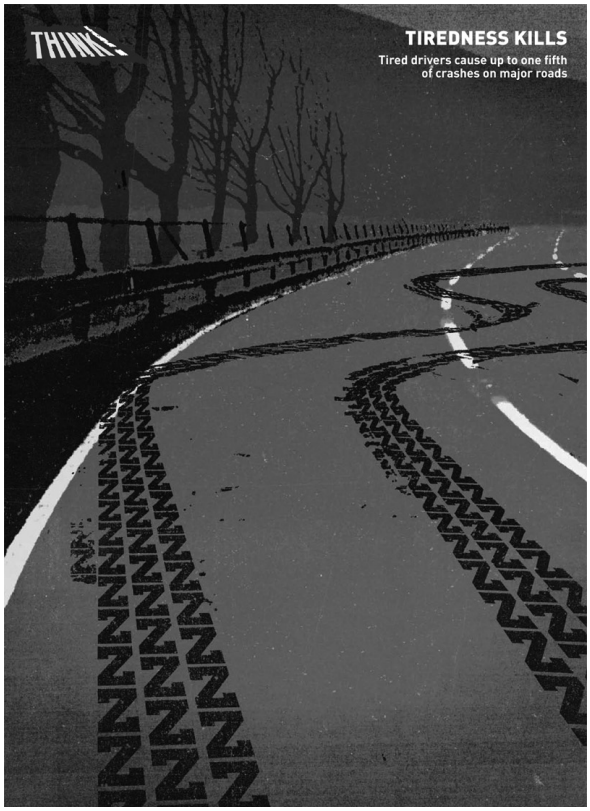
(i) Name the force between the brake and the wheel which causes the car to stop.

_____ [1]

(ii) Name the type of energy wasted during braking.

_____ [1]

(e) The poster below has been used to warn drivers of the dangers of driving when tired. Tiredness can slow a driver's reactions.



Complete the table below using a tick (✓) to show the effects tiredness will have.

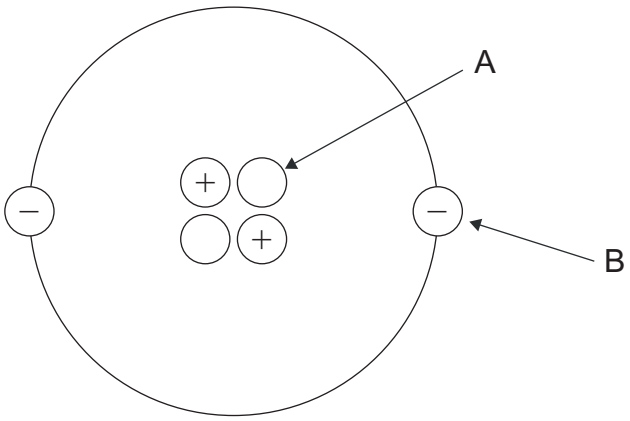
	Decrease	No change	Increase
Reaction time			
Thinking distance			
Braking distance			

[3]

Examiner Only

Marks	Remark

4 The diagram below shows the structure of an atom.

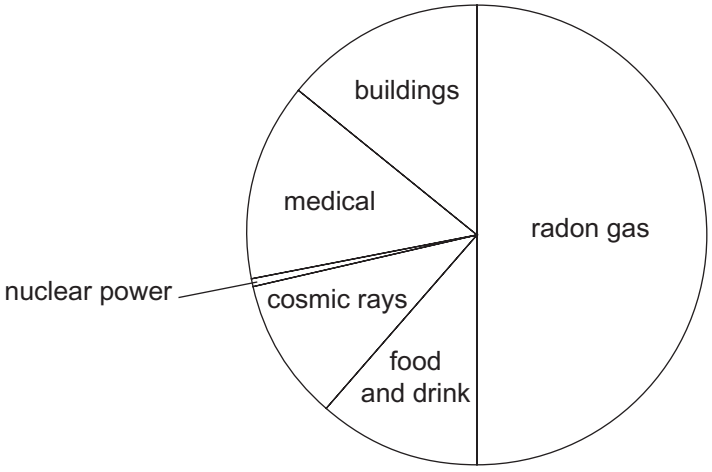


(a) Name the particles labelled A and B.

A _____

B _____ [2]

(b) The pie chart below shows sources of radiation.



(i) Use the pie chart to name **one** man-made source of radiation.

_____ [1]

(ii) What name is given to radiation which is always around us?

Circle the correct answer.

surround **background** **foreground** **underground**

[1]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

5 **(a)** The photograph below shows the Toyota Prius, a hybrid car which uses two energy sources.

© Toyota (GB) Plc, 2012 http://www.toyota.co.uk/bv/CC2/Prius/gallery/images/assets/prius-ext-1.jpg

(i) Name the **two** energy sources.

1. _____

2. _____ [2]

(ii) Explain fully why the manufacturer claims this is an environmentally friendly car.

_____

_____

_____

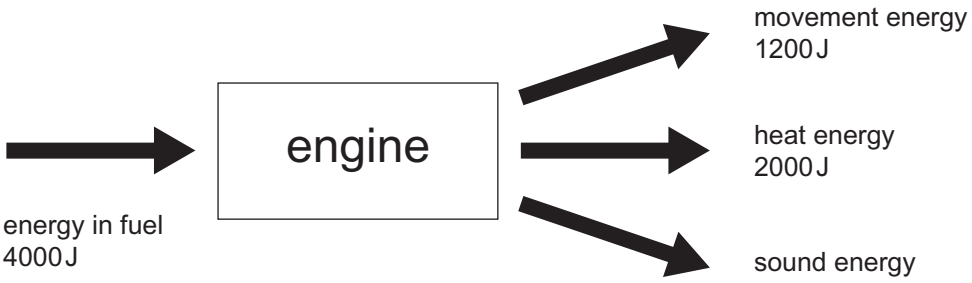
_____ [3]

(b) Manufacturers are always trying to improve the efficiency of their cars. What is meant by the term 'efficiency'?

_____

_____ [1]

(c) The diagram below shows the energy transfer in an engine.



(i) Calculate how much sound energy is produced.

_____ J [1]

(ii) Use the equation:

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

to calculate the efficiency of the engine.
(Show your working out.)

_____ [2]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

6 **(a)** Strontium-90 is radioactive and emits beta particles. Describe a simple experiment using a radiation counter, paper, aluminium and lead to show that beta particles are emitted.

[3]

(b) Strawberries are sometimes passed through a radioactive source.

© Ashley Jouhar / Science Photo Library

Explain fully how this radiation treatment is an advantage when storing strawberries.

[2]

THIS IS THE END OF THE QUESTION PAPER

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