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Cambridge Checkpoint

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
Cambridge Checkpoint

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

* 3 2 1 8 1 5 4 7 *

SCIENCE **1113/01**

Paper 1 **April 2012**

45 minutes

Candidates answer on the Question Paper.

Additional Materials: Ruler

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
You should show all your working in the booklet.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total number of marks for this paper is 50.

For Examiner's Use	
1	
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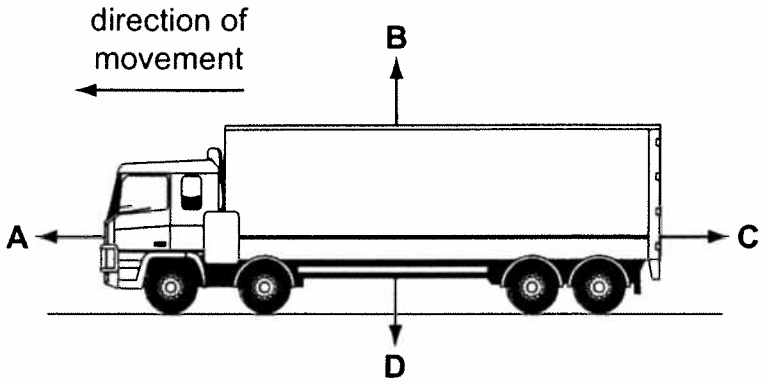
11	
Total	

This document consists of **17** printed pages and **3** blank pages.

UNIVERSITY of CAMBRIDGE International Examinations

1 The diagram shows a moving truck.

Forces **A, B, C** and **D** are acting on the truck.



(a) Draw a line from each **force** to its **name**. The first one has been done for you.

force	name
A	driving force
B	weight
C	mass
D	friction
	reaction

[2]

(b) The truck travels 45 metres in 10 seconds.

Calculate the average speed of the truck.

Show your working.

average speed = ... m/s [2]

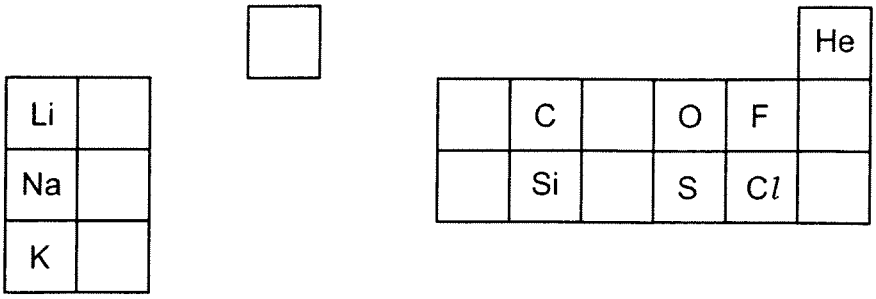
(c) The speed of the truck is increasing.

Complete the sentence.

The speed of the truck is increasing because force **A** is .....

than force **C**. [1]

2 This diagram shows part of the Periodic Table of elements.



(a) Name the elements shown in the table that are **metals**.

..... [1]

(b) Write the **symbol** for hydrogen in the appropriate empty box. [1]

(c) What is the **symbol** for silicon?

..... [1]

(d) Which is the **least** reactive metal shown in the table?

..... [1]

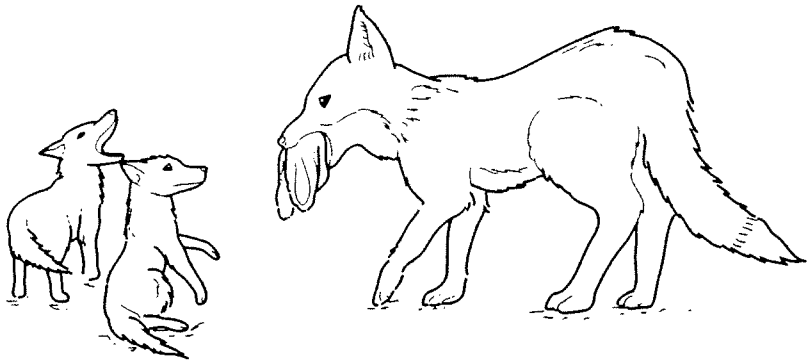
(e) Which element shown in the table could be used to kill bacteria in a swimming pool?

..... [1]

(f) Which element shown in the table has the highest atomic (proton) number?

..... [1]

3 The diagram shows a mother fox and her cubs.



There are seven characteristics that all living organisms show.

One of these is movement. The mother fox is moving towards the cubs.

(a) Explain how the diagram shows **two other** characteristics.

characteristic 1 .....

explanation .....

.....

characteristic 2 .....

explanation .....

..... [4]

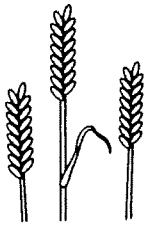
(b) A fox is a mammal.

How does the diagram show this?

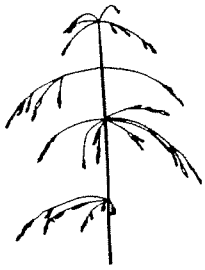
.....

..... [1]

4 (a) Modern wheat plants were developed from wild wheat by selective breeding.



modern wheat



wild wheat

Wild wheat has only a small number of small grains.

Modern wheat plants have a large number of large grains.

Read these sentences about selective breeding.

A	The two selected wheat plants were bred with each other.
B	The selection and breeding process was continued for many generations.
C	The offspring with the largest and most grains were selected. These plants were bred with each other again.
D	The two wild wheat plants with the largest and most grains were originally selected.

Write the letters of the sentences in order so that they describe the process of selective breeding.

[2]

(b) Giraffes have evolved by a process of natural selection.

They have evolved from leaf-eating animals that did not have long necks.

Read these sentences about natural selection.

A	These animals had an advantage because they get more food.
B	Animals with a longer neck were able to reach leaves higher up in trees.
C	After many generations most animals had longer necks.
D	Their offspring inherited the genes for longer necks.
E	These animals were more likely to survive and breed with each other.

Write the letters of these sentences in order so that they describe the process of natural selection.

One has been done for you.

		E		

[2]

(c) In which part of a cell is the genetic material found?

.....

[1]

5 Magnesium sulfate is a salt.

It can be prepared by the reaction between magnesium carbonate and dilute sulfuric acid.

Here are the instructions to prepare magnesium sulfate.

The instructions are **not** in the correct order.

A	Stir the reaction mixture of magnesium carbonate and dilute sulfuric acid until it stops bubbling.
B	Pour the hot filtrate into a crystallising dish.
C	Measure 25.0 cm^3 of dilute sulfuric acid using a measuring cylinder.
D	Measure out 3.0 g of magnesium carbonate powder.
E	Heat the filtrate in the beaker until the volume has decreased by half.
F	Leave the contents of the crystallising dish in a warm place until the magnesium sulfate has crystallised.
G	Pour the dilute sulfuric acid from the measuring cylinder into a beaker.
H	Slowly, add the magnesium carbonate powder to the beaker containing dilute sulfuric acid.
I	Filter the reaction mixture so that the filtrate drips into a clean glass beaker.

Write the letters of the instructions in the correct order.

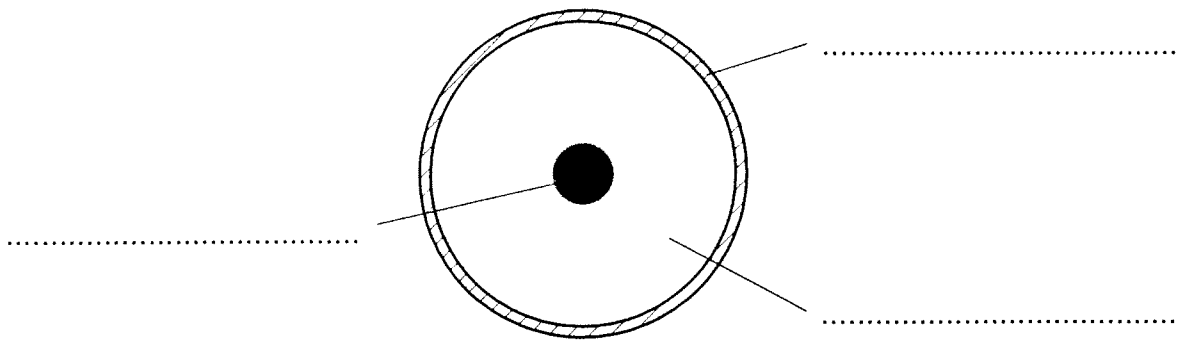
Three have been done for you.

D			**H**			**E**		

[3]

6 The Earth is made of different layers.

The diagram shows the structure of the Earth.



(a) Complete the labels of the diagram of the Earth. [3]

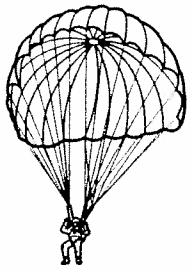
(b) The core contains some metal elements.

Name **one** of these metals.

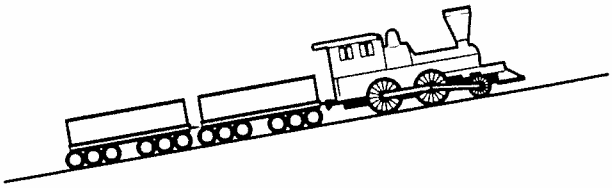
..... [1]

7 The diagrams show four objects.

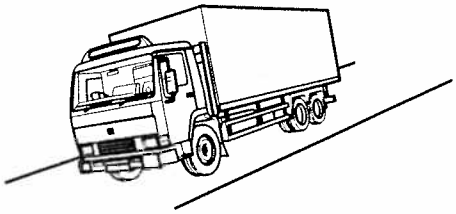
A
parachute falling at steady speed



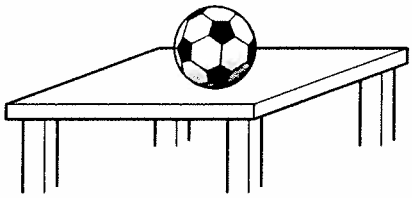
B
train climbing up a hill at steady speed



C
truck increasing speed downhill



D
football stationary on a table



(a) Complete the table about the type of energy each object has.

Put **one** tick (✓) in each row.

object	only kinetic energy	only gravitational potential energy	both kinetic energy and gravitational potential energy	neither kinetic energy or gravitational potential energy
A				
B				
C				
D				

[2]

(b) Which **two** objects are losing gravitational potential energy?

Choose from **A**, **B**, **C** or **D**.

..... [1]

(c) Which object is gaining kinetic energy?

Choose from **A**, **B**, **C** or **D**.

..... [1]

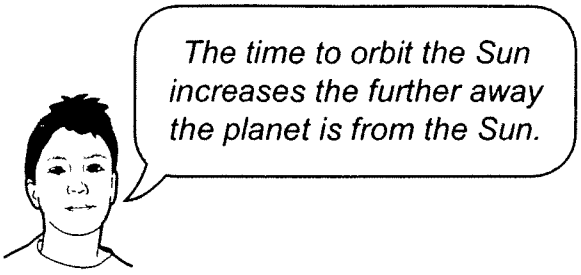
(d) The diagram shows a football rolling along level ground.

The football is losing kinetic energy.

What is happening to the speed of the football?

..... [1]

8 Usman makes a prediction about the planets in the Solar system.



Prediction 1

To find evidence to support his prediction he uses the internet.

The table shows the information he finds.

planet	relative mass compared to Earth	distance from the Sun in millions of km	average surface temperature in °C	strength of gravity in N/kg	time to orbit the Sun in Earth years
Mercury	0.05	58	169	3.7	0.2
Venus	0.81	108	460	8.9	0.6
Earth	1.00	150	14	9.8	1.0
Mars	0.11	228	63	3.7	1.9

(a) Does the information in the table support **Prediction 1**?

.....

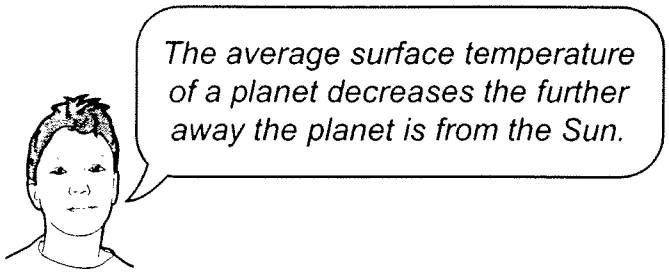
Explain your answer.

.....

.....

..... [1]

(b) Usman makes another prediction.



Prediction 2

(i) Does the information in the table support **Prediction 2**?

.....

Explain your answer.

.....

.....

..... [2]

(ii) Usman thinks he needs more evidence related to **Prediction 2.**

Suggest one **extra** piece of evidence he could use.

.....

..... [1]

(c) Usman correctly predicts he will weigh more on Earth than on Mars.

Explain how the information in the table supports his prediction.

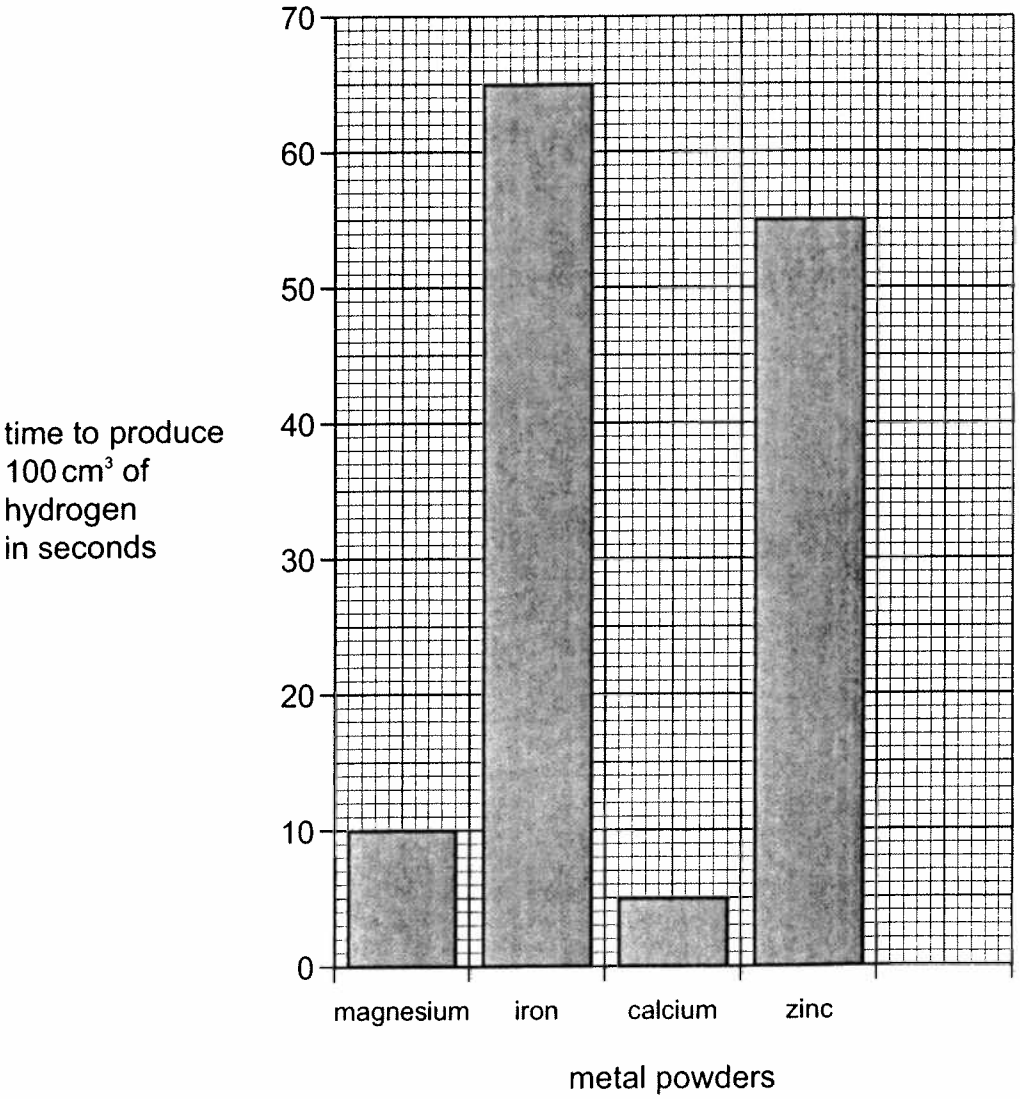
.....

..... [1]

9 Hassan investigates the reaction of four different metal powders with dilute sulfuric acid. Each reaction produces hydrogen gas.

Hassan measures the time it takes to produce 100 cm^3 of hydrogen.

The bar chart shows Hassan's results.



(a) How long did it take to produce 100 cm^3 of hydrogen using magnesium powder?

..... s [1]

(b) Which metal takes the **longest** time to produce 100 cm^3 of hydrogen?

..... [1]

(c) Put the metals in order of reactivity.

Use the results to help.

most reactive .....

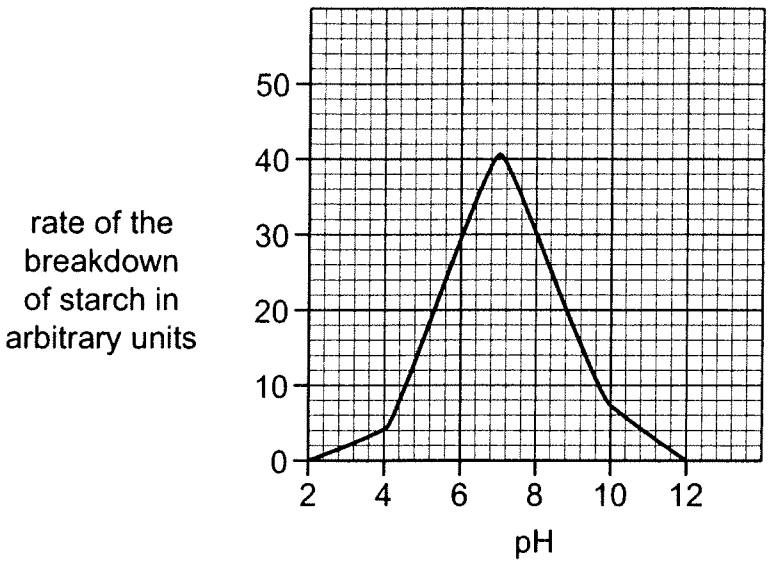
.....

.....

least reactive ..... [1]

10 Joe uses the enzyme amylase to break down starch into sugar.

(a) His graph shows how pH affects the rate of the breakdown of starch.



(i) Use information from his graph to complete the sentence.

As the pH increases the rate of the breakdown of starch .....

..... [2]

(ii) At what pH is the rate of the breakdown of starch the highest?

..... [1]

(b) State **one** variable that Joe has to keep constant in order to get the results shown in the graph.

..... [1]

(c) What is an enzyme?

..... [1]

11 The table shows how the population of people in the world has changed since the year 1300.

year	1300	1500	1700	1900	2000
population in millions	600	700	800	1700	5500

(a) The population figures are estimates.

Suggest why.

.....

..... [1]

(b) Describe how the population has changed since the year 1300.

..... [1]

(c) Write **one** factor that affects the size of the population.

..... [1]

(d) A scientist wants to predict the population of the world in one hundred years' time.

Write **one** reason why it will be difficult to make an accurate prediction.

.....

..... [1]

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