

GENERAL CERTIFICATE OF SECONDARY EDUCATION
GATEWAY SCIENCE
ADDITIONAL SCIENCE B
Unit 1 Modules B3 C3 P3
FOUNDATION TIER
THURSDAY 14 JUNE 2007

F B623/01

Afternoon
Time: 1 hour

Calculators may be used.
Additional materials: Pencil
Ruler (cm/mm)



* C U P / T 3 0 0 5 5 *

Candidate
Name

Centre
Number

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Candidate
Number

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INSTRUCTIONS TO CANDIDATES

- Write your name, Centre Number and Candidate Number in the boxes above.
- Answer **all** the questions.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- Do **not** write in the bar code.
- Do **not** write outside the box bordering each page.
- **WRITE YOUR ANSWER TO EACH QUESTION IN THE SPACE PROVIDED. ANSWERS WRITTEN ELSEWHERE WILL NOT BE MARKED.**

INFORMATION FOR CANDIDATES

- The number of marks for each question is given in brackets [] at the end of each question or part question.
- A list of physics equations is printed on page two.
- The Periodic Table is printed on the back page.

FOR EXAMINER'S USE

Section	Max.	Mark
A	20	
B	20	
C	20	
TOTAL	60	

This document consists of **20** printed pages.

2

EQUATIONS

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

$$\text{acceleration} = \frac{\text{change in speed}}{\text{time taken}}$$

$$\text{force} = \text{mass} \times \text{acceleration}$$

$$\text{work done} = \text{force} \times \text{distance}$$

$$\text{power} = \frac{\text{work done}}{\text{time}}$$

$$\text{resistance} = \frac{\text{voltage}}{\text{current}}$$

Answer **all** the questions.

Section A – Module B3

1 This question is about human growth.

(a) The list shows the main phases of human growth.

adolescence

childhood

infancy

maturity

old age

Write out the phases in order of age.

The last one has already been done for you.

1

2

3

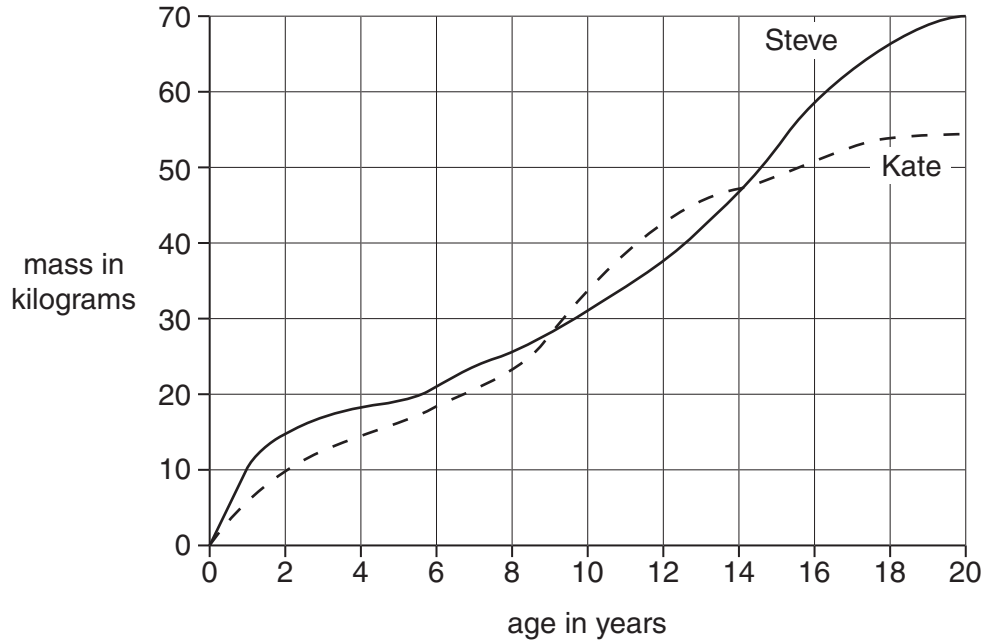
4

5 *old age*

[2]

(b) Kate and Steve are twins.

The graph shows how their mass changes as they grow.



(i) For how many years was Kate heavier than Steve?

..... [1]

(ii) Between which ages was Steve growing at the fastest rate?

..... [1]

[Total: 4]

2 Ann grows strawberry plants.

Strawberry plants can reproduce **sexually** or **asexually**.



(a) (i) The table shows some of the stages when a strawberry plant reproduces **asexually**.

Put the stages in the correct order.

Write numbers in the table to show your answer.

The first one has been done for you.

stage	order
Buds grow on the runners.	
The parent plant grows long stems called runners.	1
The runners die.	
The plantlets on the runners grow roots.	
The buds on the runners grow leaves and become plantlets.	

[2]

(ii) All of Ann’s strawberry plants have been produced by asexual reproduction.

They are **genetically identical**.

Why are they genetically identical?

.....
 [1]

(b) Ann’s neighbour Harry grows apple trees.

He has grown his apple trees from seeds. His trees are **not** genetically identical.

Describe **one** advantage of Harry’s apple trees **not** being genetically identical.

.....
 [1]

[Total: 4]

[Turn over

3 This question is about genes.

(a) The list shows some things found in cells.

amino acid

cytoplasm

DNA

membrane

nucleus

protein

Finish the sentences by choosing words from the list.

You may choose each word **once**, **more than once** or **not at all**.

(i) Genes are made of a chemical called [1]

(ii) The genes in a cell are found in the [1]

(iii) The movement of substances in and out of a cell is controlled by the
..... [1]

(b) Many genes tell cells to make enzymes.

Enzymes control different chemical processes in living things.

Look at the list.

diffusion

photosynthesis

protein synthesis

respiration

Write down **one** process that is **not** controlled by enzymes.

Choose your answer from the list.

..... [1]

[Total: 4]

4 This question is about the blood system.

Dominic has cut his arm in an accident.

He has gone to hospital because his arm is bleeding.

The doctor tells him he is lucky he has not cut an artery.

(a) A cut **artery** is more serious than a cut **vein**.

Why is a cut artery more serious than a cut vein?

Explain your answer.

.....
.....
..... [2]

(b) Dominic's arm stops bleeding **before** he has any treatment.

What makes the bleeding stop?

In your answer, include

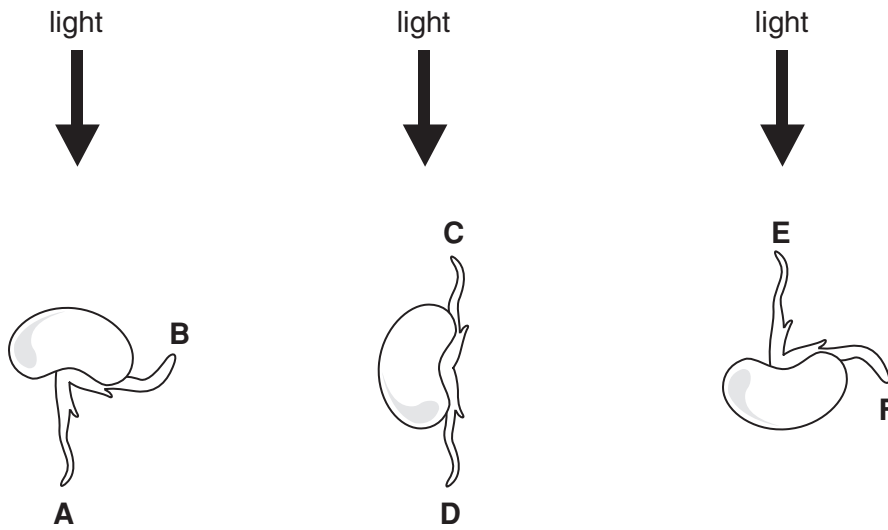
- what part of the blood is involved
- what it does.

.....
.....
..... [2]

[Total: 4]

5 This question is about plant growth.

(a) Niamh is growing some bean seeds in glass jars.



(i) Look at the diagrams.

Which **three** are the shoots?

Choose from **A, B, C, D, E** and **F**.

..... [1]

(ii) Explain your answer.

..... [1]

(b) The boxes show some uses of plant hormones and the effects of these hormones.

Draw lines to join each **use of hormone** with the **effect of the hormone**.

Draw only **three** lines.

use of hormone

used to grow new
begonia plants from
cuttings

used to remove weeds
from a lawn

used after transporting
green tomatoes from
Spain

effect of hormone

makes some plants
grow very quickly and
then die

makes roots grow
more quickly

makes fruit ripen
quickly

[2]

[Total: 4]

Section B – Module C3

6 This question is about the elements in the Periodic Table.

Look at the list of elements.

- boron
- carbon
- copper
- fluorine
- helium
- magnesium
- sodium
- sulfur

Answer the questions below.

Choose **all** your answers from the list.

Each element can be used **once, more than once** or **not at all**.

The Periodic Table on the back page may help you.

(a) Write down the **name** of an element in Group 7 (a halogen).

.....[1]

(b) In a flame test, one element gives a yellow / orange flame colour.

Write down the **name** of this element.

.....[1]

(c) Write down the **name** of an element in the same **Group** as aluminium.

.....[1]

(d) Write down the **name** of an element in the same **period** as aluminium.

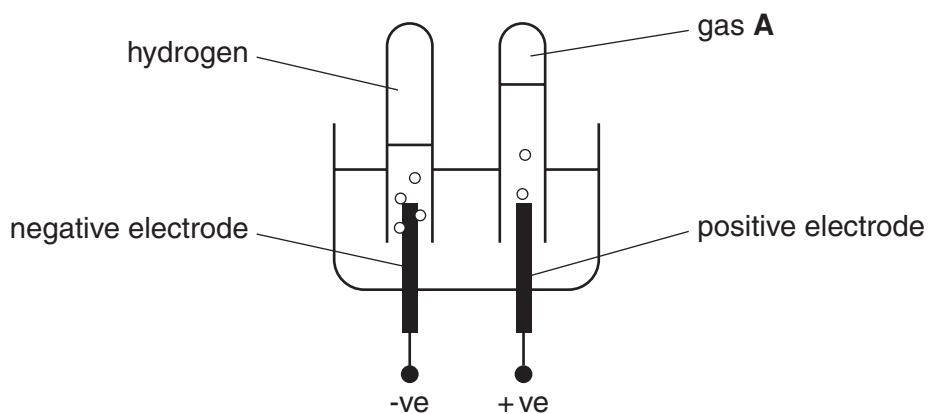
.....[1]

(e) Write down the **name** of a transition element.

.....[1]

[Total: 5]

7 Look at the diagram. It shows the electrolysis of dilute sulfuric acid.



(a) Hydrogen is made at the negative electrode.

(i) What is the name of the negative electrode?

Choose from:

anion

anode

cation

cathode

answer[1]

(ii) What is the test for hydrogen?

.....
[2]

(b) Gas **A** is made at the positive electrode.

What is the name of gas **A**?

.....[1]

[Total: 4]

8 This question is about the properties of metals.

(a) Most metals are shiny.

Put ticks (✓) in two boxes to show **two** other properties of most metals.

- good conductor of heat
- low density
- high melting point
- soft

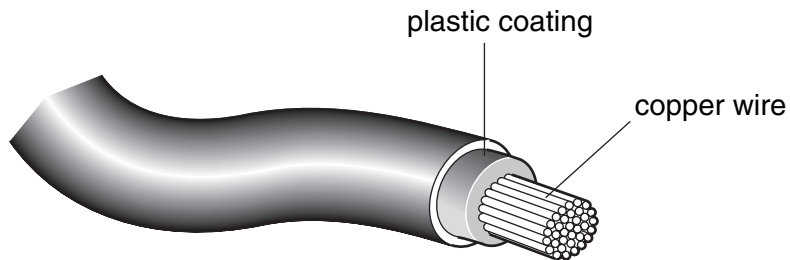
[2]

(b) At very low temperatures, some metals are **superconductors**.

What is meant by a superconductor?

.....
.....[1]

(c) Look at this electrical wire.



Copper is used to make the electrical wire.

Explain why copper is chosen to make electrical wires.

.....
.....
.....[2]

[Total: 5]

9 This question is about atoms, molecules and ions.

(a) Draw a straight line from each **particle** to an **example** of the particle.

Draw only three lines.

particle	example
atom	H ₂ O
ion	Na ⁺
molecule	He

[2]

(b) Magnesium, Mg, reacts with oxygen, O₂.
Magnesium oxide, MgO, is made.

Write a balanced symbol equation for this reaction.

.....[2]

[Total: 4]

10 Look at the table. It gives information about some particles found in atoms.

particle	charge	relative mass
A	positive	1
B	negative	0.0005
C	no charge	1

(a) Which particle is an electron?

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

answer[1]

(b) The nucleus of an atom is positively charged.

Which particle gives the nucleus its positive charge?

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

answer[1]

[Total: 2]

Section C – Module P3

11 Davinder does an experiment to find out the speeds of cars along a road.

She takes some measurements using some apparatus.

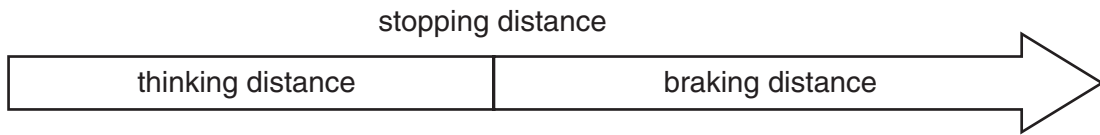
Complete the table about her experiment.

measurement	apparatus	units
distance	m
.....	stopwatch	s
speed	speedometer

[3]

[Total: 3]

12 Look at the information on the **stopping** distance for a car.



(a) What does **thinking** distance mean?

.....
.....[2]

(b) What does **braking** distance mean?

.....
.....[1]

(c) Write down two different factors that can increase **thinking** distance.

.....
.....[2]

(d) ABS brakes can make driving safer.

Suggest how.

.....
.....[1]

[Total: 6]

13 Look at the information on the fuel consumption of some vehicles.

vehicle	fuel consumption in kilometres per litre
car	15
minibus	10
motorbike	25
van	8

(a) Which vehicle has the **worst** fuel consumption?

Choose from:

car **minibus** **motorbike** **van**

.....[1]

(b) The car uses 30 litres of fuel.

Look at the table.

Suggest how many kilometres the car travelled using 30 litres of fuel.

.....[1]

[Total: 2]

14 Mike does weight training. He lifts the weights from the floor to above his head.

Look at the diagram.



(a) Mike does work when he lifts the weights.

He pushes up with a force of 500N.

He lifts the weights 2m.

Calculate the **work done** on the weights.

Select the correct equation from the list on page 2.

.....

answer J [2]

(b) Mike holds the weights **above** his head.

He holds them **still** so that they do not move.

(i) What type of energy have the weights got now?

.....[1]

(ii) **No work** is done on the weights when they are still.

Explain why no work is done.

.....
[1]

(c) Mike gets tired.

He drops the weights.

What type of energy **increases** as the weights fall?

.....[1]

(d) Mike is a very powerful weight lifter.

He develops a high power when lifting.

What does the word **power** mean?

.....
.....[1]

[Total: 6]

15 Cars have some safety features.

(a) Put a (ring) around a safety feature that absorbs energy in a crash.

Choose from:

airbag

cruise control

electric windows

safety cage

[1]

(b) Put a (ring) around one passive safety feature.

Choose from:

airbag

cruise control

electric windows

safety cage

[1]

(c) Seat belts must be replaced after a crash. Suggest why.

.....
.....[1]

[Total: 3]

END OF QUESTION PAPER

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