

**GENERAL CERTIFICATE OF SECONDARY EDUCATION
GATEWAY SCIENCE
BIOLOGY B**

B632/01

Unit 2 Modules B4 B5 B6
(Foundation Tier)

**Wednesday 21 January 2009
Afternoon**

Duration: 1 hour

Candidates answer on the question paper
A calculator may be used for this paper

OCR Supplied Materials:
None

Other Materials Required:

- Pencil
- Ruler (cm/mm)



Candidate Forename		Candidate Surname	
Centre Number		Candidate Number	

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

INFORMATION FOR CANDIDATES

- 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 **60**.
- This document consists of **20** pages. Any blank pages are indicated.

FOR EXAMINER'S USE		
Section	Max.	Mark
A	20	
B	20	
C	20	
TOTAL	60	

Answer **all** the questions.

Section A – Module B4

1 Eric is a farmer.

He grows tomato plants.



(a) The list shows parts of Eric's tomato plants.

flower leaves root stem

Choose words from the list to answer the following questions.

(i) What is the part used for reproduction? [1]

(ii) Which part contains the most chloroplasts? [1]

(b) Eric uses intensive farming methods to grow his tomatoes.

Put a tick (✓) in the box next to the best definition of **intensive farming**.

A method that produces as much food as possible without
damaging the environment.

A method that uses living organisms to control pests.

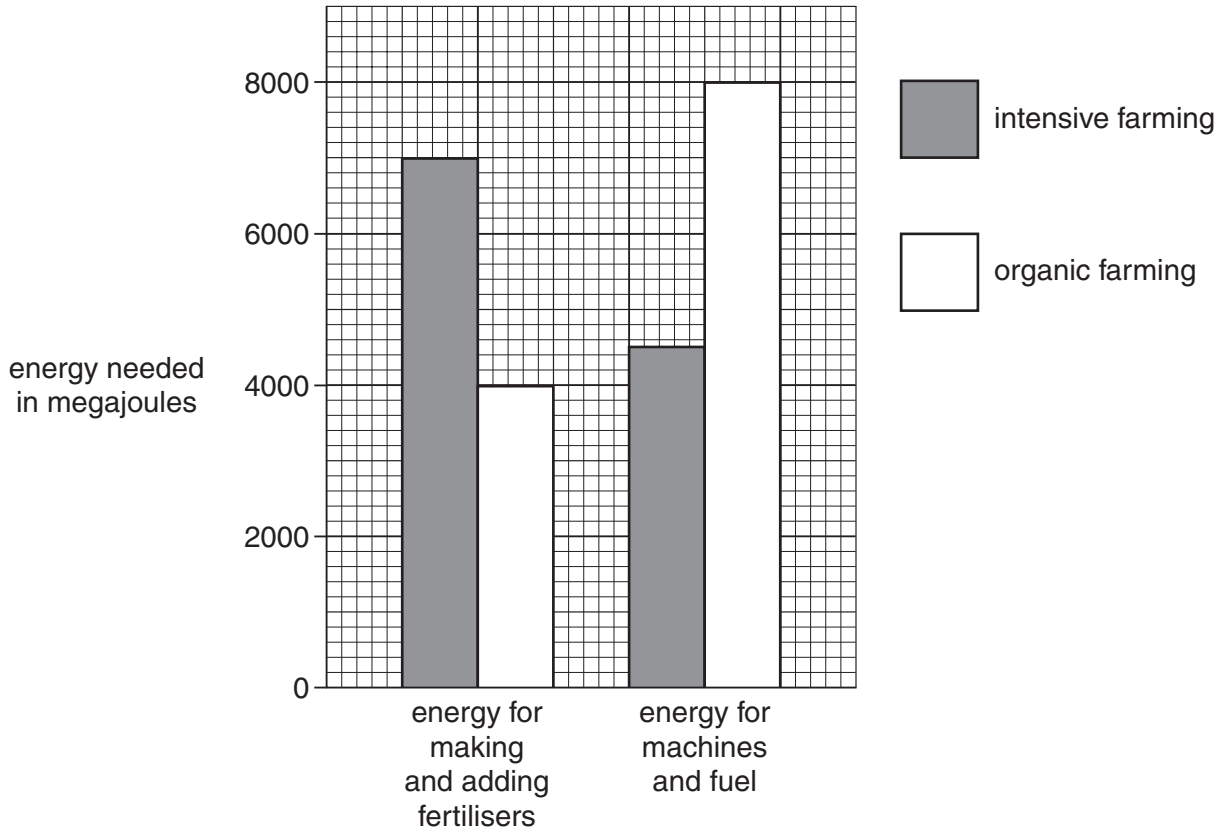
A method that uses crop rotation.

A method that produces as much food as possible from
the land available.

[1]

(c) The graph shows some of the energy needed to produce one tonne of tomatoes.

It shows the energy for intensive and organic farming.



(i) Eric uses this data to give an opinion about intensive farming.

Use the data in the graph to finish his sentences.



I think that intensive farming needs **less** energy overall than organic farming.

Although intensive farming needs **more** energy for it only uses megajoules for machines and fuel.

[2]

(ii) Although intensive farming may use less energy to produce tomatoes, it has disadvantages compared to organic farming.

Write down **one** disadvantage of intensive farming.

..... [1]

[Total: 6]

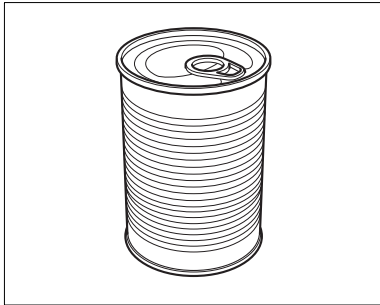
Turn over

2 Food can be preserved in different ways.

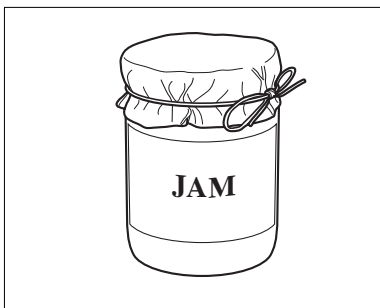
(a) Draw straight lines to join the **example** of food preservation to the **name** of the technique.

example

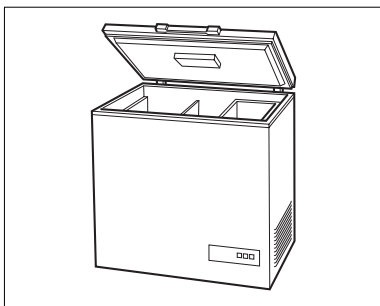
name



freezing



canning



adding sugar

[2]

(b) Finish the following sentences about preserving food.

Food goes bad because it is decomposed by microorganisms such as
..... and bacteria.

To decay food these microorganisms need a suitable temperature, moisture and a supply of
the gas [2]

(c) Why are microorganisms important in a gardener's compost heap?

..... [1]

[Total: 5]

3 The largest tree in the world grows in California.

It is called 'General Sherman'.



© Vanessa Vick / Science Photo Library

(a) All trees are **producers**.

What is meant by the term producer?

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

(b) The 'General Sherman' tree is nearly 84 metres tall.

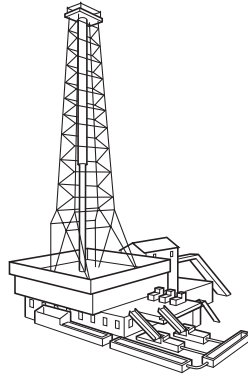
Explain how water is transported from the roots up to the leaves.

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

[Total: 3]

4 This article appeared in a recent newspaper.

Plants help mining company



A mining company that digs up minerals, such as magnesium, is looking to plants for help.

Usually the company has to dig many holes to find out where the minerals are. Now they are accurately measuring the minerals in plant leaves.

The plants have taken up the minerals from underground. The mining company can therefore tell exactly where to dig for each mineral.

(a) Which part of the plant absorbs minerals from underground?

..... [1]

(b) What do plants use magnesium for?

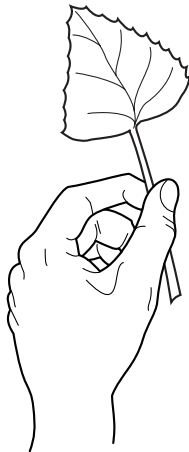
.....
..... [1]

(c) Describe what plants look like if there is a **lack** of magnesium in the soil.

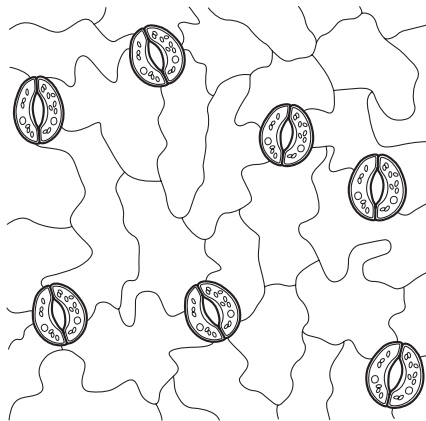
.....
..... [1]

[Total: 3]

5 Vera wants to look at a plant leaf using a microscope.



She makes a leaf print and looks at it with a microscope.



(a) Vera can see leaf pores (stomata) on her slide.

Why do plants need leaf pores (stomata)?

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

(b) Vera makes the leaf print from the **bottom** surface of her leaf.

The **top** surface of a leaf is adapted to reduce water loss.

Write down **one** way that the top surface is adapted to reduce water loss from the leaf.

..... [1]

[Total: 3]

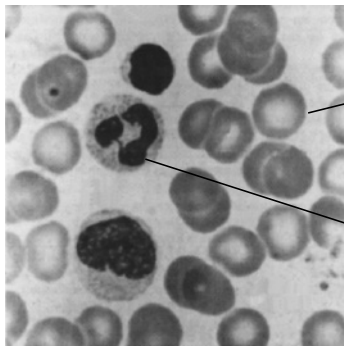
Section B – Module B5

6 Helen works in a laboratory that collects donated blood.



(a) She looks at some blood under the microscope.

Label the cells in the photograph.



.....

.....

[2]

(b) Helen tests the blood to find out which group it is.

Write down the name of **two** blood groups.

..... [1]

(c) Blood clots when it comes into contact with the air.

Put a ring around the chemical Helen can use to **stop** the blood clotting.

- antibiotic antibody anti-coagulant**

[1]

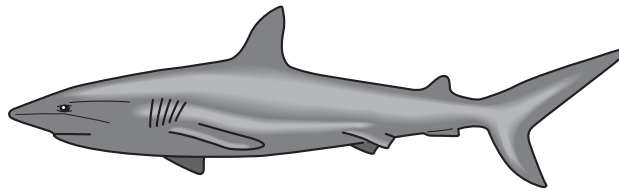
(d) Some people have an inherited condition which means that their blood does **not** clot as easily as it should.

Write down the name of this inherited condition.

..... [1]

[Total: 5]

7 Look at the picture of the shark.



(a) Sharks have an internal skeleton.

What substance is the skeleton made from?

..... [1]

(b) Sharks take in oxygen from the water.

(i) Write down the name of the **organ** they use.

..... [1]

(ii) Describe what sharks use the oxygen for.

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

(c) Sharks pump blood around their body using a **single circulatory system**.

What is meant by the term single circulatory system?

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

(d) Finish the sentence about circulatory systems.

Choose words from this list.

bronchioles capillaries closed double open ventricles

The blood of the shark flows around the body in vessels.

The smallest vessels are called

Insects are different from sharks. Their blood does not always flow in vessels.

The circulatory system of insects is [2]

[Total: 7]

8 This question is about excretion.

(a) The kidneys excrete water and urea.

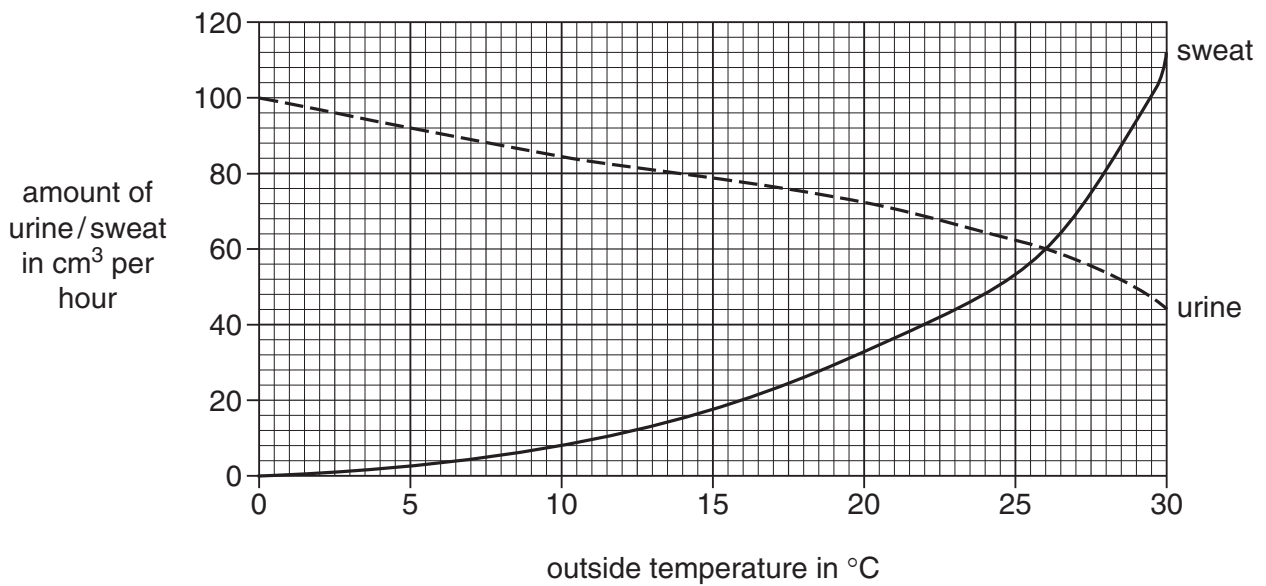
(i) Write down the name of **another** organ that excretes water.

..... [1]

(ii) Which organ **makes** urea?

..... [1]

(b) A student investigates the amount of sweat and urine produced at different temperatures. The graph shows his results.



(i) Describe how the amount of urine produced changes as the temperature increases.

..... [1]

(ii) At what temperature is the amount of urine and sweat the same?

..... [1]

(c) Describe how sweating cools down the skin.

..... [1]

[Total: 5]

9 This question is about reproduction and growth.

(a) Finish the table by writing in the name of the part of the reproductive system next to the job it does.

Choose words from this list.

ovary oviduct penis scrotum testis uterus

job	part of reproductive system
makes sperm	
makes eggs	

[2]

(b) An egg and a sperm join during fertilisation.

The fertilised egg then divides to make new cells.

Write down the name of this type of cell division.

..... [1]

[Total: 3]

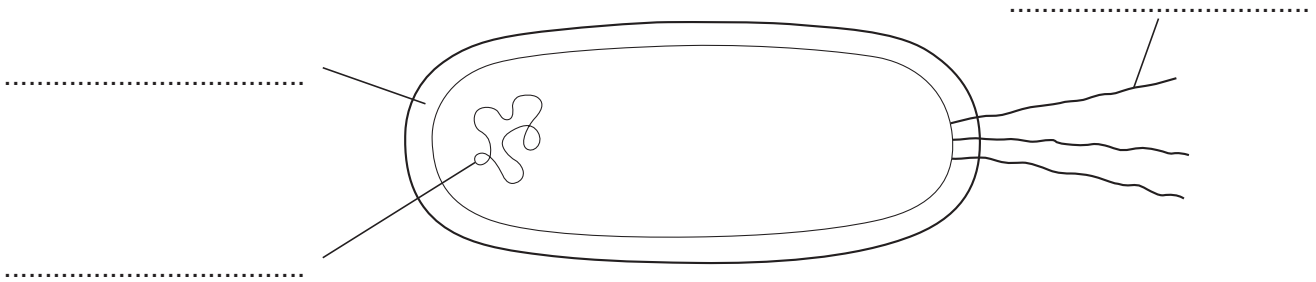
Section C – Module B6

10 This question is about bacteria.

(a) Some bacteria cause disease.

(i) *E. coli* bacteria can cause food poisoning.

Look at the diagram of an *E. coli* cell.



Complete the labels on the diagram.

Use the words from this list.

- cell wall
- DNA
- flagellum

[2]

(ii) *E. coli* bacteria get into the body through the mouth when we eat contaminated food.

Write down **one other** way bacteria can get into the body.

.....

..... [1]

(iii) Look at the list of some other diseases.

- chickenpox
- malaria
- smallpox
- tuberculosis

Write down **one** disease caused by bacteria.

Choose from the list.

answer [1]

(b) Some bacteria are useful.

For example, some bacteria have been **genetically engineered** to make human insulin.

The insulin is used to treat people who have diabetes.

(i) Describe what happens in genetic engineering.

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

(ii) The genetically engineered bacteria are grown in a fermenter.

When the bacteria grow quickly they reproduce every 20 minutes.

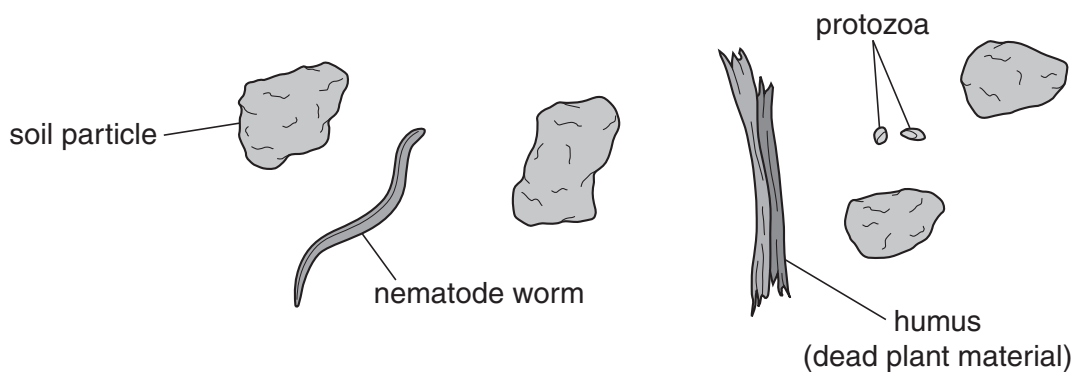
If there is 1 bacterial cell at the start, how many cells will there be after 1 hour?

answer [1]

(c) Some bacteria live in soil.

Mary uses a microscope to look at some soil.

The picture shows some of the things she sees.



Mary's teacher says that the soil contains bacteria but she will **not** be able to see them.

Why will Mary **not** be able to see any bacteria?

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

[Total: 8]

Turn over

11 This question is about the sea.

(a) Look at the food chain found in the sea.



Look at the list.

detritivores

herbivores

pathogens

phytoplankton

zooplankton

Which word describes the microscopic plants in the food chain?

Choose your answer from the list.

answer [1]

(b) Plants that live on land usually live in soil.

Land plants get many of the same things from soil that the microscopic plants get from sea water.

Look at the list.

anchorage

light

minerals

water

What do plants living in soil need that microscopic plants living in sea water do **not** need?

Choose your answer from the list.

answer [1]

(c) Sea water can be polluted by oil spills.

Scientists are investigating different ways of getting rid of the oil from oil spills.

One way is to use enzymes to break down the oil.

Enzymes can be put in alginate beads to keep them together.

What is the method of keeping enzymes together called?

..... [1]

(d) Sea water can also be polluted by artificial fertilisers.

Suggest how artificial fertilisers can get into sea water.

In your answer include

- where the fertilisers come from
- how they get into the sea.

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

(e) Fertiliser pollution in the sea can cause the number of microscopic plants to increase.

The number of microscopic plants can increase for other reasons.

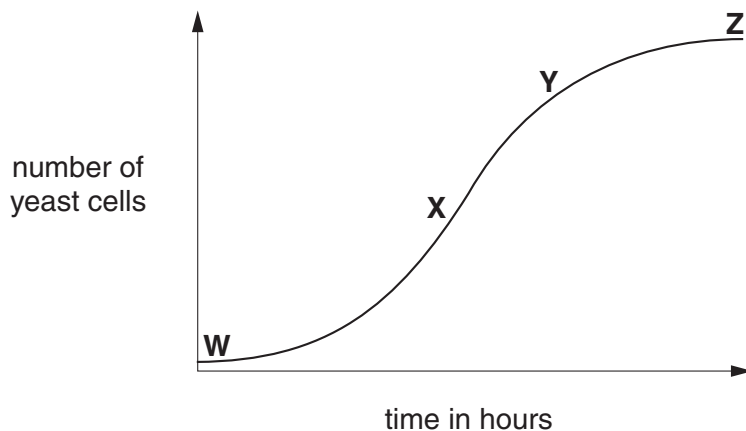
Write down **one other** reason why the number of microscopic plants could increase.

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

[Total: 6]

12 This question is about yeast.

(a) Look at the graph. It shows how the number of yeast cells changes over time as yeast grows.



(i) When is the yeast growing at its fastest rate?

Choose from **W**, **X**, **Y** or **Z**.

answer [1]

(ii) The graph is for yeast cells kept at 30 °C.

How would the number of yeast cells change if they had been kept at 10 °C?

Show your answer by drawing another line on the graph. [1]

(b) Yeast respire anaerobically to produce ethanol (alcohol).

Complete the word equation.

..... → ethanol + (+ energy) [2]

(c) Ethanol can be mixed with petrol to make a biofuel called gasohol.

Gasohol is cheaper than ordinary petrol.

Write down **two other** advantages of gasohol compared with ordinary petrol.

1

.....

2

..... [2]

[Total: 6]

END OF QUESTION PAPER

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