OCR
RECOGNISING ACHIEVEMENT

H

GENERAL CERTIFICATE OF SECONDARY EDUCATION

GATEWAY SCIENCE

B632/02

BIOLOGY B

Unit 2 Modules B4 B5 B6
(Higher Tier)

CUP/T70859

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)

Wednesday 21 January 2009
Afternoon

Duration: 1 hour

B632/02

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**	

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Answer **all** the questions.

Section A – Module B4

1 Farmers may produce crops by intensive farming or by organic farming.

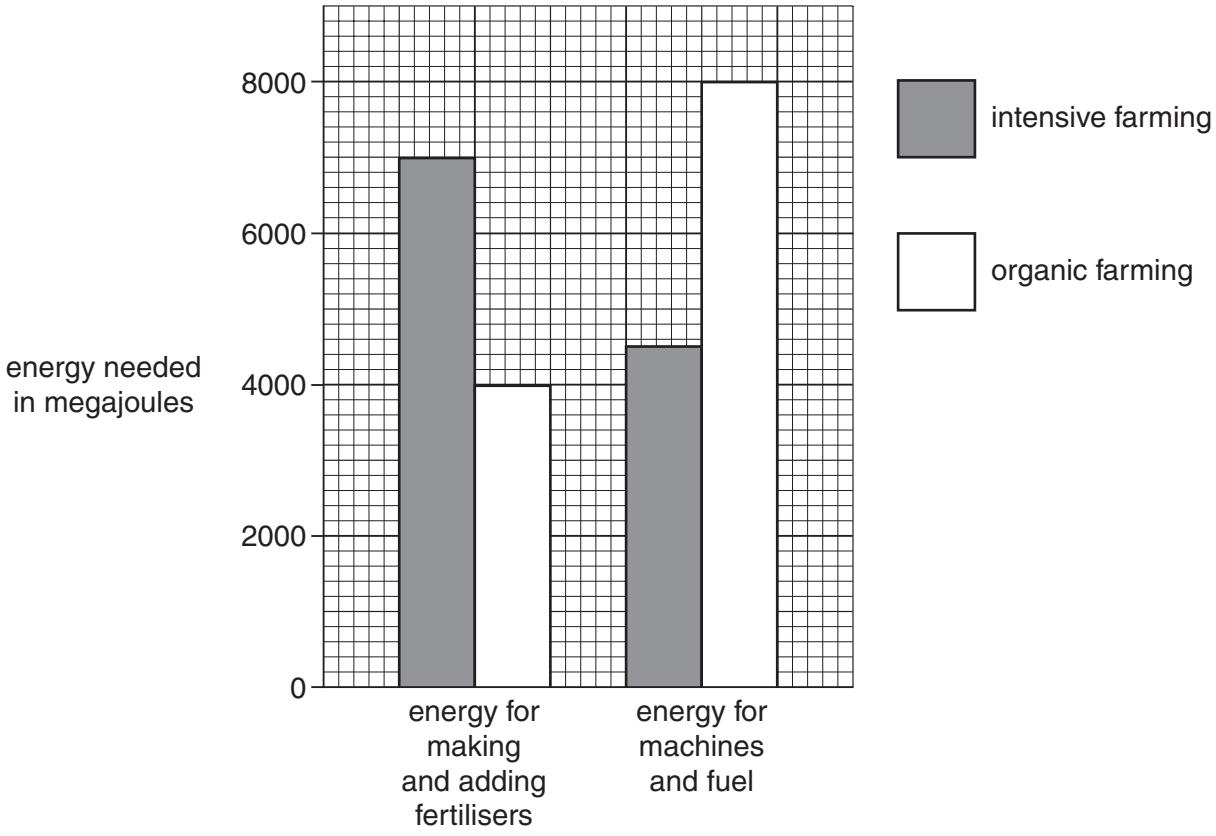
(a) Put a tick (✓) in the box next to the best definition of **intensive farming**.

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]

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

It shows the energy for intensive and organic farming.



Eric and Ernie have different views on the two methods of farming.

Eric

Ernie

(i) Use figures from the graph to support Eric's view about intensive farming.

.....

.....

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

(ii) Use **one** example to explain why Ernie might be correct about intensive farming damaging the environment.

.....

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

[Total: 4]

2 Food can be preserved in different ways.

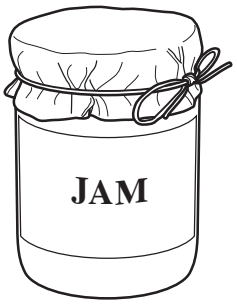
(a) Food goes bad because of the action of **saprophytes**.

How does a saprophyte feed?

.....

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

(b) One method of food preservation is by adding sugar to make jam.



How does adding sugar help to stop the action of saprophytes?

.....

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

[Total: 3]

3 The largest tree in the world lives in California.

It is called 'General Sherman'.

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

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

.....

.....

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

(b) Sugar is also transported in the tree.

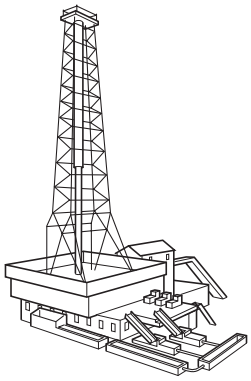
Name the tissue that transports sugar in the tree.

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

[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.

Minerals like magnesium are usually present in the ground in low concentrations.

Usually the company has to dig many holes to find out where the minerals are most concentrated. 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) What do plants use magnesium for?

.....

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

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

.....

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

(c) The minerals are in low concentrations in the soil.

Plants need oxygen to take up these minerals.

(i) Write down the name of the process they use to take up the minerals.

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

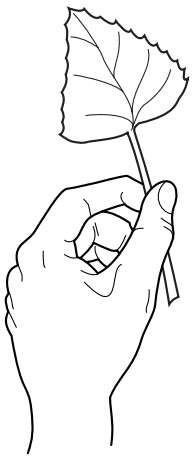
(ii) Explain why they need oxygen for this process.

.....

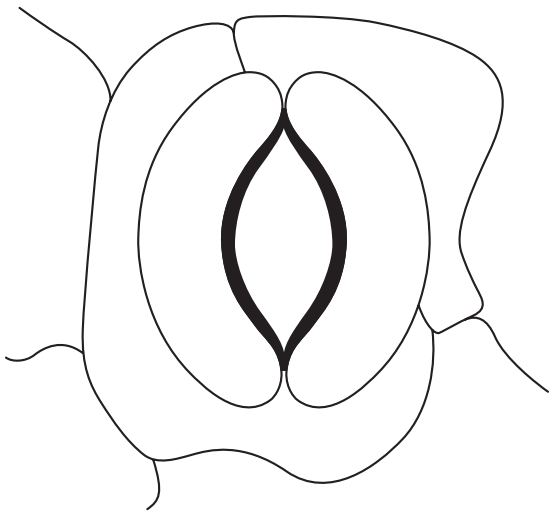
..... **[1]**

[Total: 4]

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) Write the letter **X** in one of the guard cells shown on Vera's leaf print. **[1]**

(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.

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

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

(ii) How do the differences between the top surface and bottom surface of a leaf help the plant to lose **less** water?

.....

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

Turn over for remainder of question 5

(c) The stomata (leaf pores) on a leaf can open and close.

(i) What causes stomata to **open**?

Put a tick (✓) in the box next to the correct explanation.

The waxy cuticle can grow back from the stomata.	☐
The guard cells take up water by osmosis and become turgid.	☐
The guard cells become replaced by cells of the lower epidermis.	☐
The guard cells lose water by osmosis and become flaccid.	☐

[1]

(ii) Stomata can close to reduce water loss.

It is important for the plant that stomata do not **stay** completely closed.

Explain **two** reasons why.

1 .....

.....

2 .....

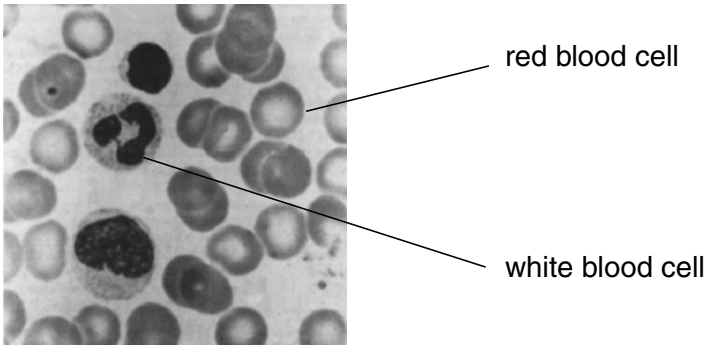
..... **[2]**

[Total: 6]

Section B – Module B5

6 Helen works in a laboratory that collects donated blood.

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



(i) Write down the job of red blood cells.

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

(ii) Explain how the shape of the red blood cell helps it do its job.

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

(b) Helen tests the blood to find out the blood group. The blood belongs to blood group A.

Finish the sentence.

Group A blood can be given to people with either blood group …… or blood group …… .
[1]

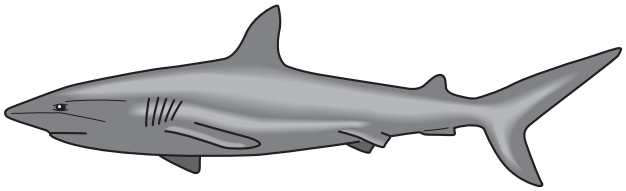
(c) Some people have an inherited condition which means that their blood does **not** clot as easily as it should.

Write down the name of this inherited condition.

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

[Total: 4]

7 Look at the picture of the shark.



(a) Sharks have an internal skeleton.

Describe **two** advantages of an internal skeleton compared to an external skeleton.

1 .....

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

(b) Sharks use their gills to take in oxygen from water.

Describe **one** way in which the gills are adapted for efficient gas exchange.

.....

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

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

What is meant by the term single circulatory system?

.....

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

(d) A scientist called William Harvey made important discoveries about blood circulation.

Describe **two** of William Harvey's ideas about blood circulation.

1 .....

.....

2 .....

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

[Total: 6]

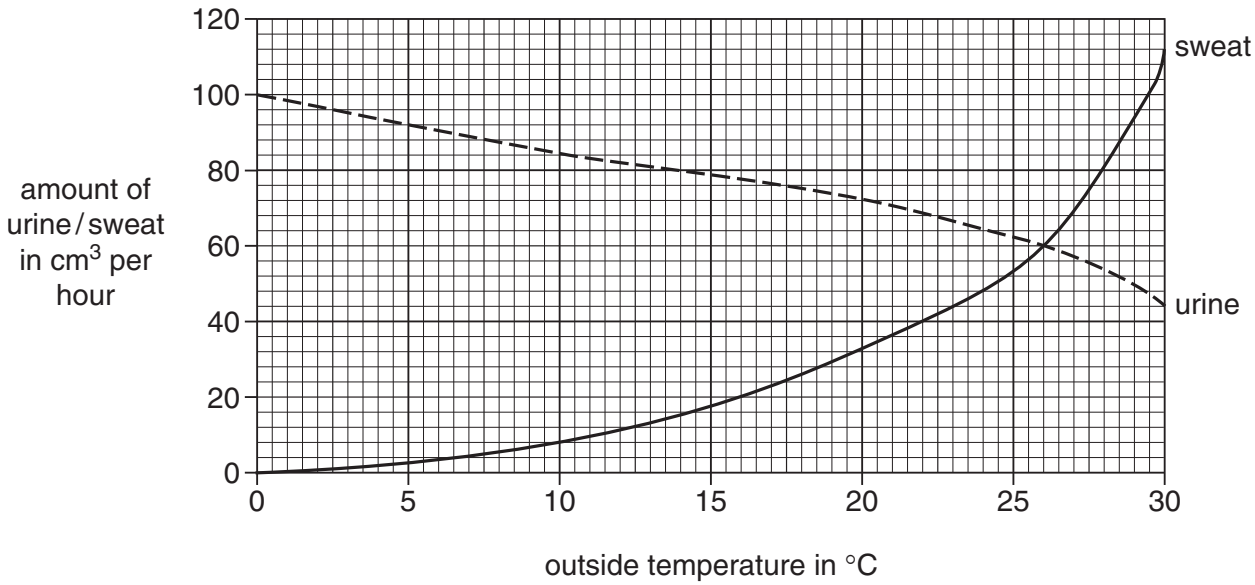
8 This question is about excretion.

(a) The kidneys excrete water and urea.

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) The concentration of the urine also changes as the temperature increases.

Explain how the body controls the concentration of urine as the temperature increases.

.....

.....

.....

..... **[3]**

(d) Describe how sweating cools down the skin.

.....

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

[Total: 7]

9 A couple are expecting a baby.

During the pregnancy they have the foetus screened for Down's syndrome.

(a) Write down the name of the process the doctors use to screen the foetus.

Choose from:

amniocentesis **echocardiogram** **immunisation** **X-ray**

answer ..... **[1]**

(b) The average life expectancy for people with Down's syndrome has increased from 25 years in 1983 to 49 years in 1997.

Suggest **one** reason why.

.....

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

(c) The result of the screening shows that the foetus probably has Down's syndrome.

The couple wish to continue the pregnancy.

One issue they need to consider is their child's life expectancy.

Write about **one** other issue that they need to consider.

.....

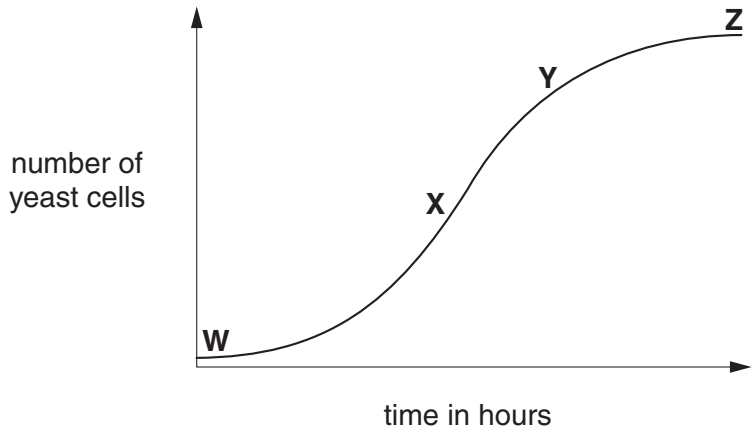
..... **[1]**

[Total: 3]

Section C – Module B6

10 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 respires 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 .....

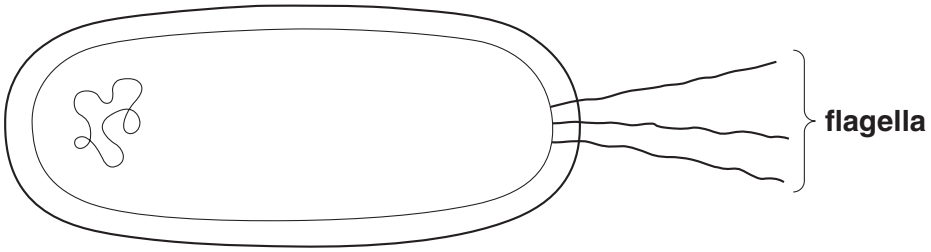
.....

2 .....

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

[Total: 6]

11 *E. coli* is a type of bacterium. The diagram shows an *E. coli* cell.



(a) Write down the job of the flagella.

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

(b) The list shows the four main shapes of bacteria.

curved rod

rod

spherical

spiral

What shape are *E. coli* bacteria?

Choose your answer from the list.

answer ..... **[1]**

(c) *E. coli* are normally found living in the intestine.

They can cause food poisoning.

Describe how *E. coli* bacteria can be transmitted from one person to another.

.....

.....

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

(d) *Salmonella* microorganisms can also cause food poisoning.

The list shows some different types of microorganisms.

bacteria

fungi

protozoa

viruses

What type of microorganism is *Salmonella*?

Choose your answer from the list.

answer ..... **[1]**

[Total: 5]

12 Salmon are a type of fish.

They live in the sea for most of their lives.

They return to fresh water rivers to breed.

(a) Look at the table. It compares the urine salmon produce in sea water and fresh water.

	amount of urine	**concentration of urine**
in sea water	small	high
in fresh water	large	low

In fresh water salmon produce large amounts of low concentration urine.

Explain why.

.....

.....

.....

..... **[3]**

(b) American scientists have genetically engineered salmon so they grow up to ten times faster than normal.

They plan to keep the salmon in fish farms.

(i) Use the information above, together with your own knowledge, to explain **one advantage** of growing these genetically engineered salmon rather than normal salmon.

.....

.....

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

(ii) Use the information above, together with your own knowledge, to explain **one disadvantage** of growing these genetically engineered salmon rather than normal salmon.

.....

.....

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

[Total: 5]

13 This question is about different types of sugar.

(a) The enzyme sucrase (invertase) breaks down sucrose into glucose and another sugar.

(i) Write down the name of the other sugar.

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

(ii) Glucose tastes sweeter than sucrose.

Food manufacturers often use glucose as a sweetener instead of using sucrose.

Explain why.

.....

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

(b) Lactose is a sugar found in milk.

Some people are lactose intolerant.

They can **not** break down lactose into glucose and galactose.

If lactose is **not** broken down it can cause pain and diarrhoea.

(i) Explain **one other** reason why lactose needs to be broken down.

.....

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

(ii) Suggest why lactose intolerant people can **not** break down lactose.

.....

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

[Total: 4]

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