

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

B632/01

Unit 2 Modules B4 B5 B6 (Foundation Tier)

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)

**Monday 24 January 2011
Afternoon**

Duration: 1 hour



Candidate forename		Candidate surname	
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Centre number						Candidate number				
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INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Answer **all** the questions.
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

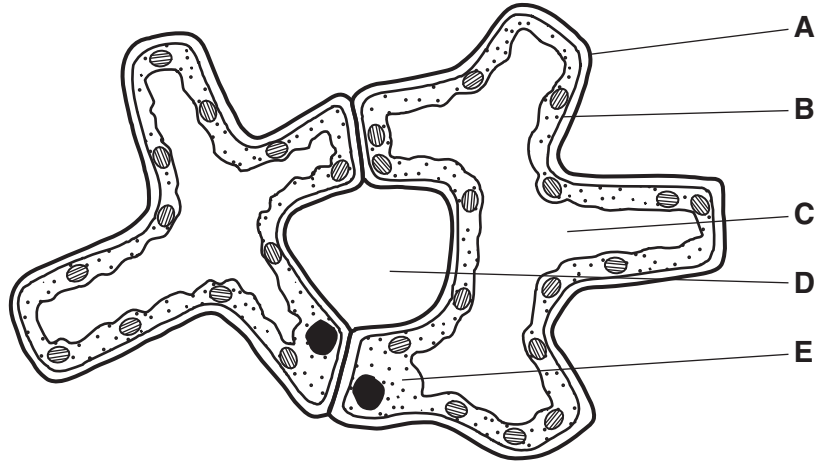
- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **60**.
- This document consists of **24** pages. Any blank pages are indicated.

Answer **all** the questions.

Section A – Module B4

1 Look at the diagram.

It shows two plant cells.



(a) Which labelled part is the vacuole?

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

answer

[1]

(b) Write down the job of part **A**.

.....

[1]

(c) Look at the picture.

It shows a bird standing on a giant water lily leaf.



Leaves make the food for the plant.

Finish the sentences.

Use the **best** words from this list.

- chloroplasts
- phloem
- photosynthesis

- pores
- reproduction
- respiration
- stalk

Leaves use light energy to make food by a process called

Light energy is absorbed by

Oxygen is lost through the leaf [3]

(d) Water lily plants take in minerals in the same way as other plants.

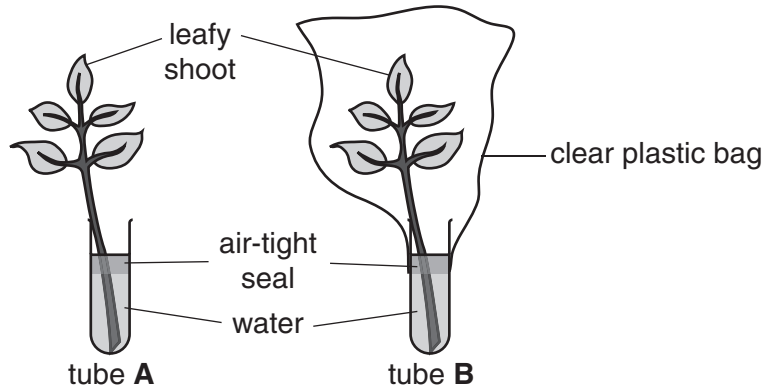
(i) Write down the name of the part of the plant that takes in minerals.
..... [1]

(ii) Fertilisers can be used to give the lily plant more minerals.
NPK fertilisers contain nitrates, phosphates and one **other** main mineral.
Write down the name of this mineral.
..... [1]

[Total: 7]

2 Carol is investigating the effect of humidity on water loss in plants.

Look at the diagram of the apparatus she uses.



(a) Carol records the mass of each tube and its contents.

She leaves the apparatus for three days in the same room.

She then records the mass again.

Which tube would you expect to lose **least** mass?

tube

Explain your answer.

.....

.....

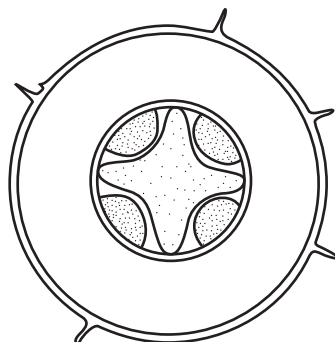
..... [2]

(b) Water moves through plants in xylem vessels.

Look at the diagram.

It shows a cross-section of a root.

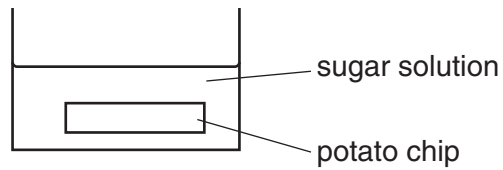
Put an **X** on the diagram to show the position of the xylem.



[1]

(c) Carol now investigates the effect of water loss on plant cells.

Look at the diagram of the apparatus she uses.



Carol records the mass of four different potato chips.

She puts potato chip **A** into water.

She puts chips **B**, **C** and **D** into different concentrations of sugar solution.

She leaves them for 24 hours.

Carol records the new mass of each chip.

The table shows some of her results.

potato chip	concentration of solution in g per dm ³	mass in g		
		before	after	difference
A	0	4.0	4.2	
B	30		4.1	+0.1
C	60	4.2	4.1	
D	90	4.1		-0.2

(i) Calculate the missing results.

Write your answers in the table.

[2]

(ii) Potato chip **D** lost mass.

Explain why.

Use ideas about osmosis.

.....

.....

..... [2]

[Total: 7]

3 Ricky is a gardener.

He has a problem with plants called Japanese knotweed.

Japanese knotweed grows very fast and competes with the plants Ricky wants to grow.

The picture shows some Japanese knotweed.



(a) Ricky could use a chemical to kill the Japanese knotweed.

Put a ring around the type of chemical he should use.

fungicide

herbicide

insecticide

[1]

(b) Ricky decides to use biological control instead.

He finds out that he can buy insects from Japan which eat Japanese knotweed.

Ricky decides to use insects to get rid of his Japanese knotweed.

Suggest **one** possible problem with using insects.

.....

..... [1]

(c) Japanese knotweed can be dug up and left to decay in plastic bags.

The decayed Japanese knotweed can then be put onto a compost heap.

Bacteria are needed to decay the Japanese knotweed.

The bacteria need to be kept warm.

Write down **two other** things that the bacteria need to help them decay the Japanese knotweed.

1

2 [2]

(d) Ricky grows raspberries in his garden.

He needs to preserve the raspberries to stop them decaying.

One way is to turn them into jam by adding sugar.

Write down **two other** ways to preserve fruit.

1

2 [2]

[Total: 6]

Section B – Module B5

4 (a) Different types of animals have different types of circulatory systems.

Draw straight lines to connect each **animal** to its **type of circulatory system**.

animal	type of circulatory system
amoeba	closed
human	open
insect	none

[2]

(b) (i) Cathy is playing hockey.

She feels hot and needs to cool down.

Her skin produces a substance to help her cool down.

Write down the name of this substance.

..... [1]

(ii) Cathy trips and badly grazes her knee.

Later she notices a clear, yellow liquid seeping from the damaged skin.

This liquid is a part of the blood.

Write down the name of this liquid.

..... [1]

(iii) Cathy visits the health clinic.

A nurse treats her wound.

Cathy sees her medical card.

The card has a box that shows her blood group.

Put ticks (✓) in the boxes next to the **two** possible blood groups.

A+

B-

C+

D-

[2]

[Total: 6]

10
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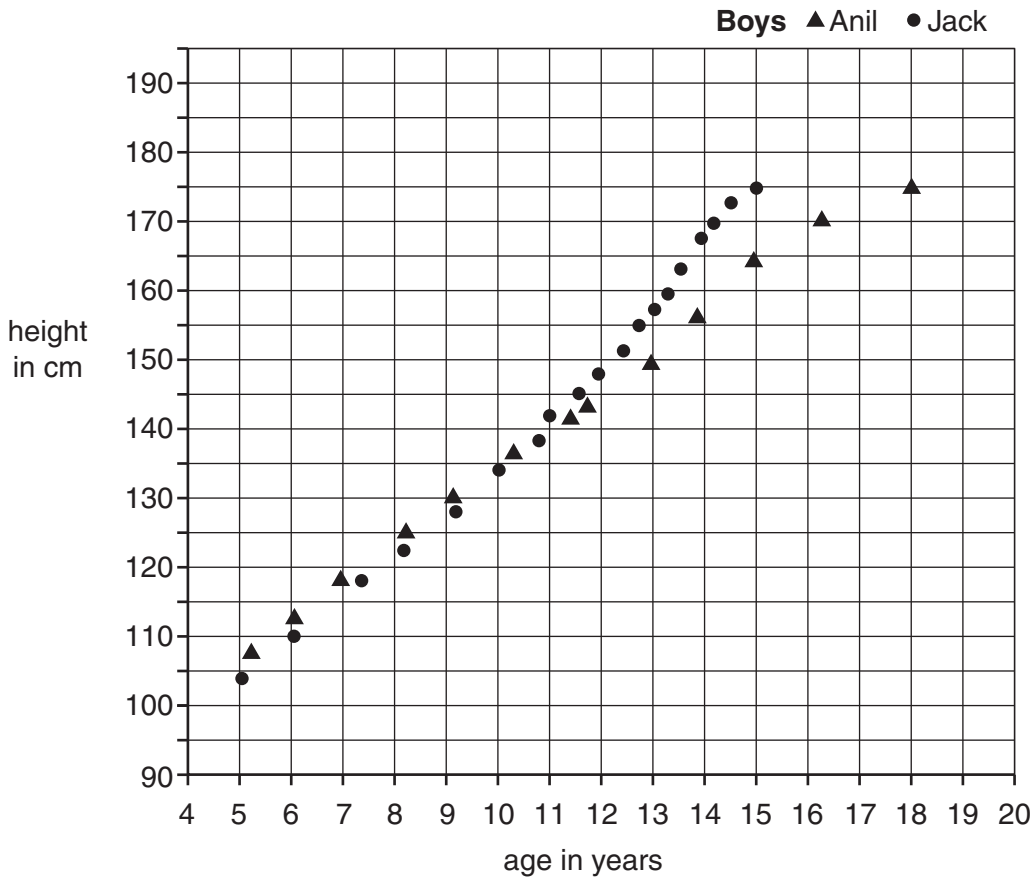
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5 Anil and Jack were born on the same day.

They had their heights measured.

Measurements were taken until each boy reached 175 cm.

The chart shows how their heights changed during these years.



(a) Jack reached 175 cm before Anil.

How many years before Anil did Jack reach 175 cm?

..... [1]

(b) The steepest part of the graph for Jack is between the ages of 11 and 15.

(i) Calculate Jack's average height increase per year between the ages of 11 and 15.

.....

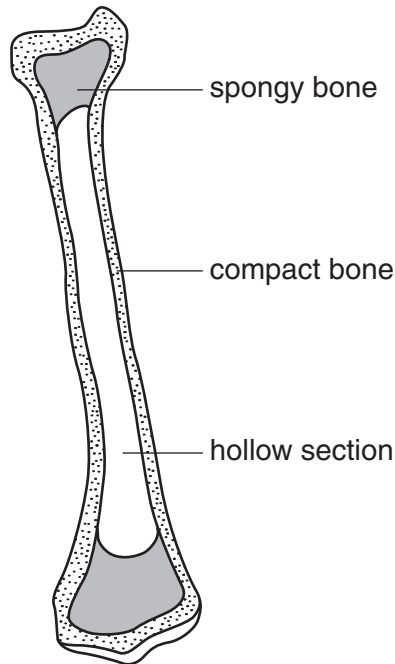
answer cm per year [2]

(ii) Write down the word that describes this period of Jack's life.

..... [1]

(c) The long bones in the body grow rapidly during growth spurts.

Look at the diagram of a long bone.



(i) Long bones are hollow. Other bones are solid.

Write down **one** advantage of hollow bones compared to solid bones.

..... [1]

(ii) Sometimes these bones fracture.

What is used to detect fractures?

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

- gamma rays
- infrared rays
- microwaves
- X-rays

[1]

(d) Bones in the hip sometimes become damaged.

They can be repaired using a replacement hip joint.

Most replacement hip joints are made with a metal ball and a plastic socket.

The replacement hip joint only lasts for about 20 years.

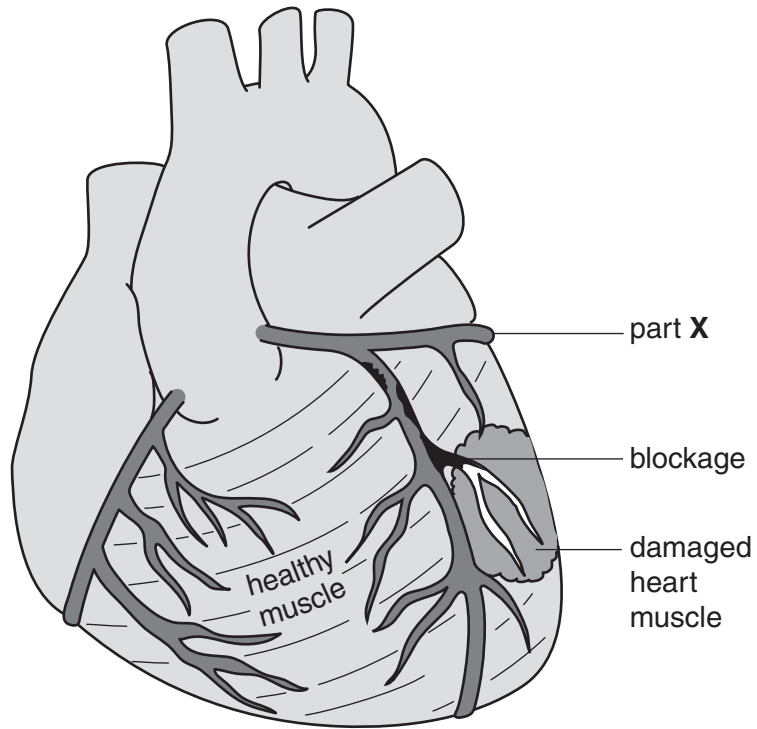
Suggest why.

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

[Total: 7]

6 Look at the diagram.

It shows the heart of a patient with heart disease.



(a) (i) Part X supplies blood to the heart muscle.

Write down the name of part X.

..... [1]

(ii) In this heart, part X has a **blockage**.

The heart muscle has been damaged by this blockage.

Write down **two** reasons why the blockage causes damage.

1

.....

2

..... [2]

(b) This patient is given **anti-coagulant** drugs.

How do these drugs affect the blood?

..... [1]

(c) Pulse rate can be measured to provide information on how well the heart is working.

Write about how pulse rate can be measured.

Your answer should include

- where the pulse can be found
- what equipment is needed to measure the pulse
- what units the pulse is measured in.

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

[Total: 7]

Section C – Module B6

- 7 (a) Growing tea plants is very important to farmers in India.



The tea plants get some of the elements that they need from minerals in the soil.

- (i) Write down the name of **one** element that is recycled in the soil and is used by plants.

..... [1]

- (ii) Apart from minerals, the plants also need the soil for other reasons.

Write down **one** of these reasons.

..... [1]

- (b) Scientists are trying to find ways to increase the yield of the tea plants.

They treat the soil in four fields in four different ways.

They then measure the yield of the tea plants.

The results are shown in the table.

treatment	digging the soil	digging the soil and adding compost	digging the soil and adding worms	digging the soil and adding compost and adding worms
yield in kg per field per year	3000	5200	5500	6500

- (i) Digging the soil and adding compost increases the yield more than just digging the soil.
Calculate by how much more it increases.

.....
.....
.....

answer kg per field per year [1]

- (ii) Adding compost increases the yield of the tea plants.

Write down **one** reason why.

..... [1]

- (iii) Adding compost and worms increases the yield more than just adding compost.

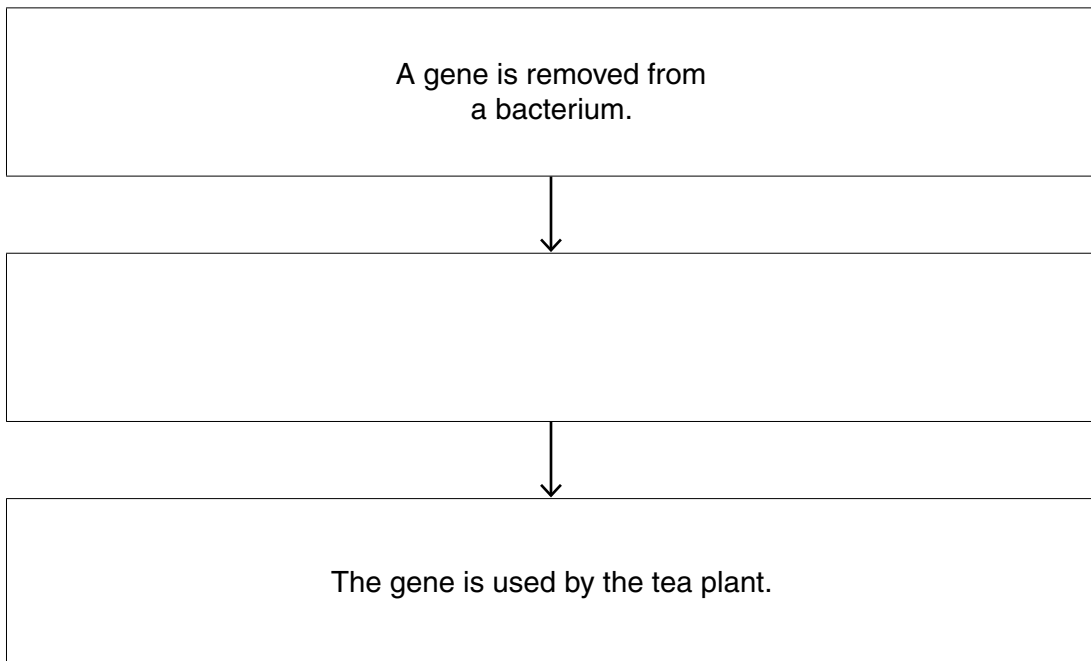
Suggest **one** reason why adding worms increases the yield.

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

- (c) Scientists are now trying to produce genetically engineered tea plants.

This involves three main steps.

Fill in the middle box to show the missing step.



[1]

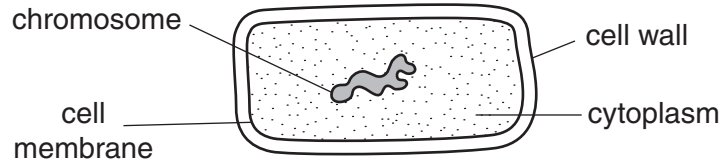
[Total: 6]

Turn over

8 (a) Bacteria are used in the production of yoghurt.

One of the bacteria used is *Lactobacillus*.

One of these bacteria is shown in the diagram.



(i) Bacteria cells are different from both plant and animal cells.

Write down **one** way in which bacterial cells are different from both plant and animal cells.

..... [1]

(ii) The boxes contain features of *Lactobacillus*.

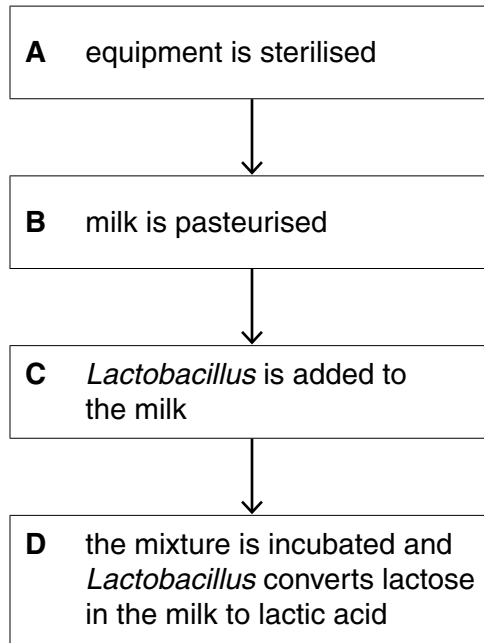
They also show reasons for these features.

Draw straight lines to join each **feature** to the correct **reason**.

feature	reason
<p><i>Lactobacillus</i> can increase in numbers rapidly.</p>	<p>It has a cell wall.</p>
<p><i>Lactobacillus</i> cannot move itself around.</p>	<p>It does not have a flagellum.</p>
<p><i>Lactobacillus</i> does not burst easily.</p>	<p>It can undergo binary fission.</p>

[1]

(b) Making yoghurt involves a number of stages.



Which stage shown in the flow diagram occurs at 78 °C?

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

answer

[1]

(c) Other **types** of food are also made using bacteria.

Write down the name of **one** of these foods.

..... [1]

[Total: 4]

9 (a) Different diseases are caused by different types of microorganism.

(i) Write down **two** ways that microorganisms can enter the body.

- 1
- 2 [2]

(ii) Cholera is a disease caused by bacteria.

Write down the name of **one type** of drug that can be used to treat people with cholera.
..... [1]

(b) Outbreaks of cholera can rapidly spread from country to country.

Scientists first thought that cholera can only be spread by people travelling.

Some scientists now think that it can be spread by zooplankton living in the oceans.

(i) What type of organism are **zooplankton**?

Put a tick (✓) in the box next to the correct type of organism.

- microscopic plants
- nematode worms
- microscopic animals
- bacteria

[1]

(ii) The number of zooplankton living in the oceans can vary through the year.

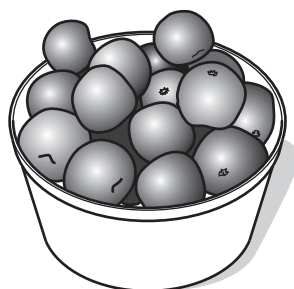
This is often due to changes in the temperature of the water.

Write down **one other** factor that can affect the number of zooplankton living in the oceans.

..... [1]

[Total: 5]

10 Lucinda collects lots of apples from her apple tree.



She crushes them to get out the apple juice.

(a) Lucinda wants to make cider from the apple juice.

Explain how she could do this.

In your answer include

- what she needs to add to the apple juice
- the name of the reaction that occurs
- what products are made.

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

(b) A friend has told Lucinda that she could turn her cider into a spirit.

(i) What process is used to turn cider into a spirit?

..... [1]

(ii) Lucinda should **not** turn her cider into a spirit.

Why is this?

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

[Total: 5]

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