OCR
RECOGNISING ACHIEVEMENT

F

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)

Friday 12 June 2009
Morning

Duration: 1 hour

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.

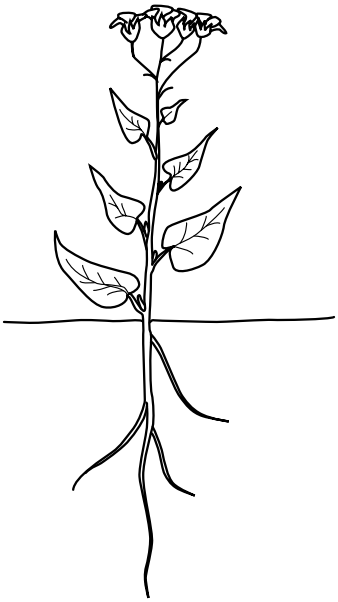
INFORMATION FOR CANDIDATES

- 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 **24** pages. Any blank pages are indicated.

Answer **all** the questions.

Section A – Module B4

1 Look at the picture of a plant.



Plants have different parts.

(a) The lists show three parts of the plant and the jobs they do.

Draw a **straight** line from each **part** to the **job** it does.

Draw **three** lines.

part	job
flowers	to reproduce
stem	to take in water
roots	for support

[2]

(b) Plants have chloroplasts so they are able to photosynthesise.

Write down the job of chloroplasts during photosynthesis.

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

(c) Plants need minerals to stay healthy.

Write down the name of the part of the plant that takes in minerals.

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

[Total: 4]

2 This question is about plants and water.

Plants lose water by transpiration.

(a) Describe how water is lost from plants.

.....

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

(b) Transpiration is important to plants because it provides water for photosynthesis.

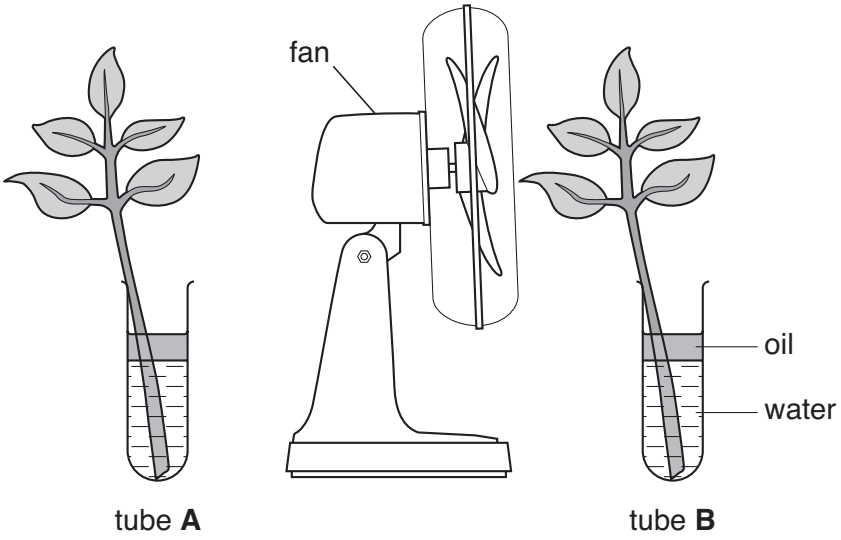
Write down **two other** things transpiration provides water for.

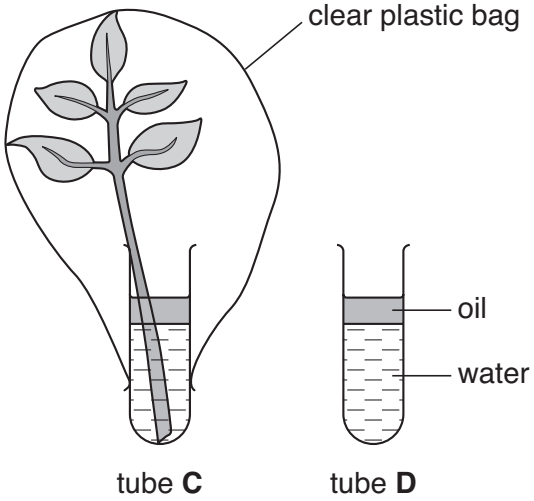
1 .....

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

(c) Jamie is investigating the effect of different factors on transpiration in plants.

Look at the diagram. It shows the apparatus he uses.





Jamie records the mass of each tube and its contents.

He leaves the apparatus for 5 days in the same room.

Tubes **B** and **C** are given **different** conditions. He then records the mass again.

The table shows Jamie's results.

tube	**A** – left at room temperature	**B** – left in room with a moving fan next to it	**C** – left in room with a clear plastic bag over it	**D** – left at room temperature
mass at start in g	42.4	43.3	41.2	31.9
mass at end in g	35.3	32.7	40.4	31.9
mass lost in g	7.1		0.8	0.0

(i) Calculate the mass lost by tube **B**.

mass lost = ... g **[1]**

(ii) Describe the effect increasing air movement has on transpiration in plants.

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

(d) Tube **C** is testing a different factor from tube **B**.

Put a (ring) around this factor.

humidity **light** **temperature** **wind**

[1]

(e) Explain why Jamie set up tube **D**.

.....

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

[Total: 8]

3 Australia produces a lot of sugar cane. Sugar cane can be used to fuel cars.

(a) This is an example of using biomass as a fuel.

Write down **one other** example.

Choose from this list.

kerosene **paraffin** **petrol** **wood**

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

(b) Insects eating the sugar cane affect the production of the crop.

(i) Write down the name of the type of chemical farmers could use to kill the insects.

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

(ii) Cane toads were introduced to feed on the insects.

Suggest **one** disadvantage of this type of biological control.

.....

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

[Total: 3]

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Question 4 begins on page 8.

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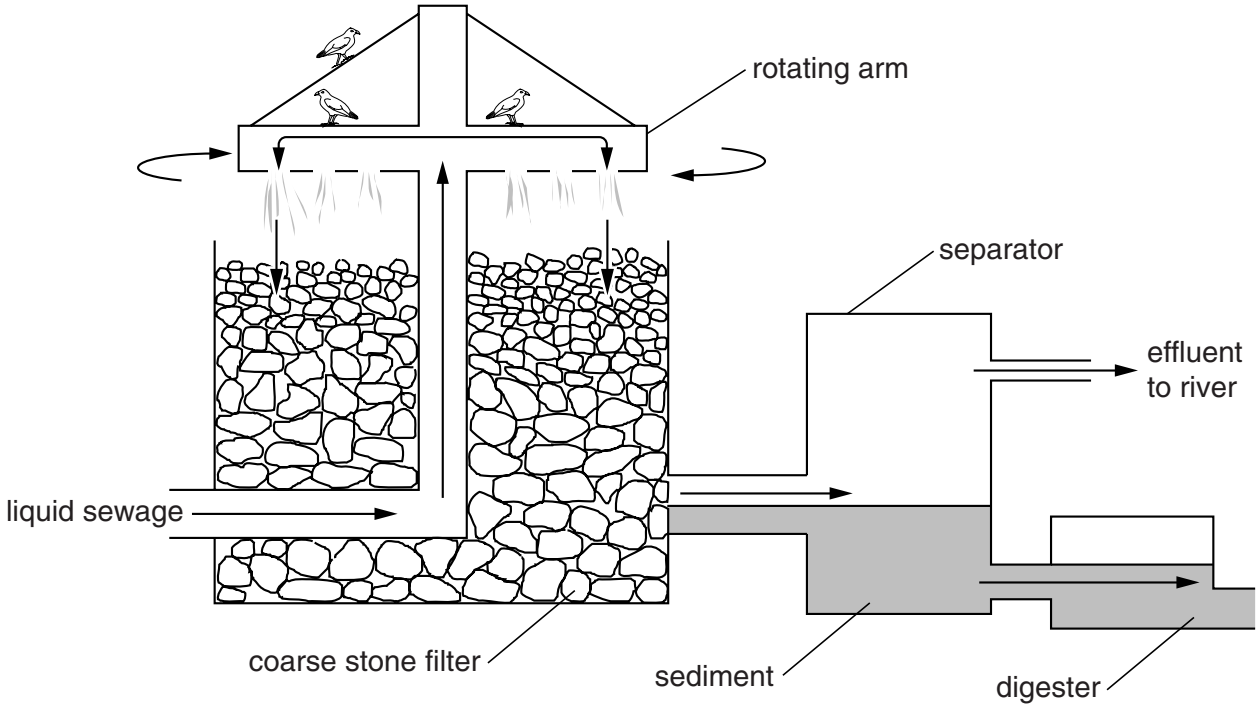
4 Look at the diagram. It shows part of a sewage works.



(a) Microorganisms called decomposers are used to break down the sewage.

Write down the name of **one** type of microorganism that is a decomposer.

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

(b) The microorganisms need a gas to help them break down the sewage.

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

carbon dioxide	☐
carbon monoxide	☐
nitrogen	☐
oxygen	☐

[1]

(ii) This gas is one factor that helps the microorganisms.

Write down **one other** factor that helps the microorganisms to break down sewage.

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

(c) After sewage has been treated it can be used as a fertiliser.

(i) Fertilisers contain minerals, such as nitrates, needed for healthy plant growth.

One sign of nitrate deficiency is poor growth.

Write down **one other** sign of nitrate deficiency in plants.

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

(ii) Plants also need other minerals in fertilisers.

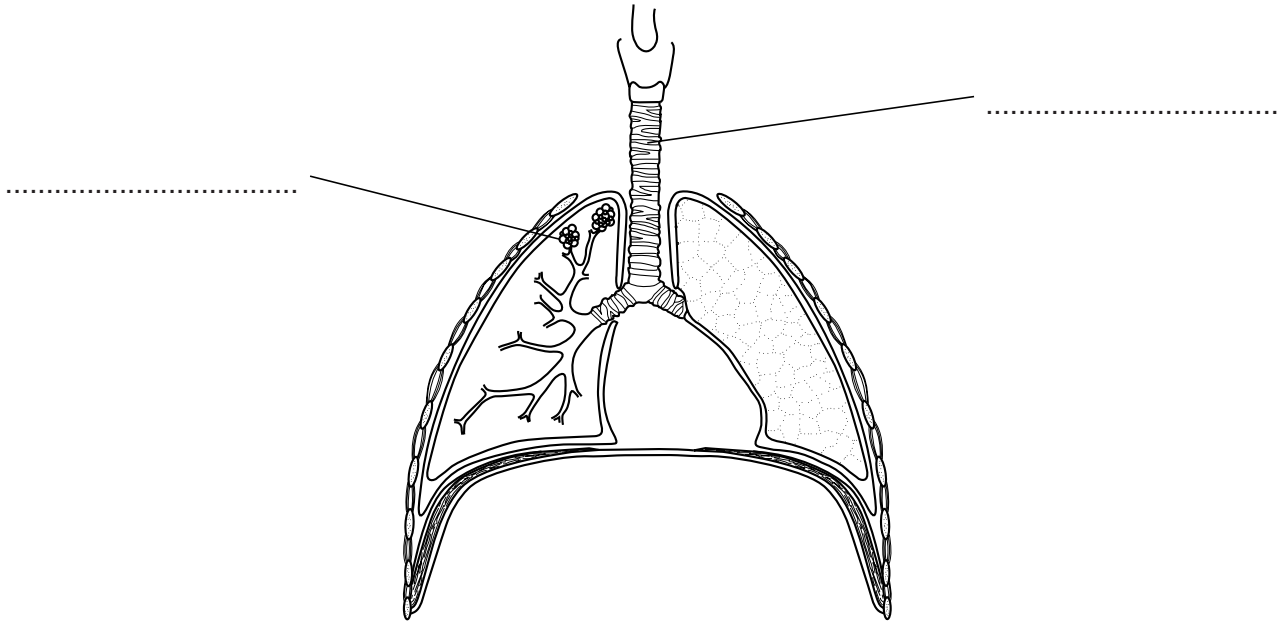
Write down the name of **one other** mineral in fertilisers needed for **photosynthesis**.

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

[Total: 5]

Section B – Module B5

5 The diagram shows the main parts of the human respiratory system.



(a) Finish the diagram by writing the correct part next to each label line.

Choose the parts from this list.

air sac

bronchus

diaphragm

intercostal muscle

trachea

[2]

(b) The respiratory system can be damaged by a number of different medical conditions.

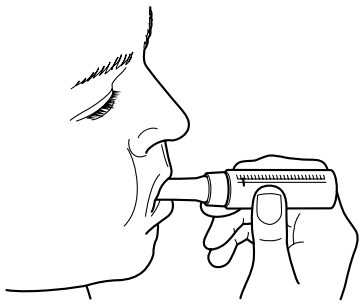
One of these conditions is asthma.

Write down the name of **one other** condition that can damage the respiratory system.

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

(c) John has asthma.

He tests himself using a peak flow meter.



(i) John blows into the meter.

It measures how quickly he blows air out of his lungs.

Explain how this can help to tell John how bad his asthma is.

.....

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

(ii) John uses an inhaler to treat his symptoms of asthma.

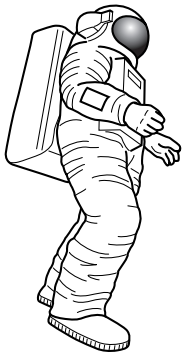
What effect do the drugs inside the inhaler have on John's respiratory system?

.....

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

[Total: 5]

6 Astronauts sometimes spend long periods of time in space.



When astronauts return to Earth a number of changes may have happened to their bodies.

These include:

- weakening of their muscles
- increased risk of blood clots
- decreased amount of haemoglobin
- weaker bones
- lower heart rate and blood pressure

(a) (i) Which of these changes could be treated with anti-coagulants?

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

(ii) Describe the function of haemoglobin.

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

(b) Scientists have used studies on astronauts to learn more about the disease osteoporosis.

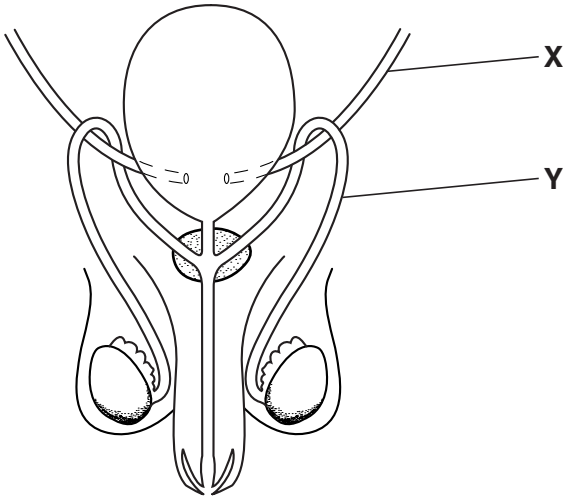
How can studying astronauts help scientists learn more about osteoporosis?

.....

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

[Total: 3]

7 The diagram shows the male reproductive system.



The two tubes **X** and **Y** carry different liquids.

Tube **X** carries a liquid produced by the kidneys for excretion.

Tube **Y** carries the male gametes.

(a) (i) Write down the name of the part where the male gametes are made.

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

(ii) Write down the name of tube **Y**.

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

(b) Write down the name of a substance usually found in the liquid in **X**.

Choose the correct answer from this list.

enzymes **haemoglobin** **protein** **sweat** **urea**

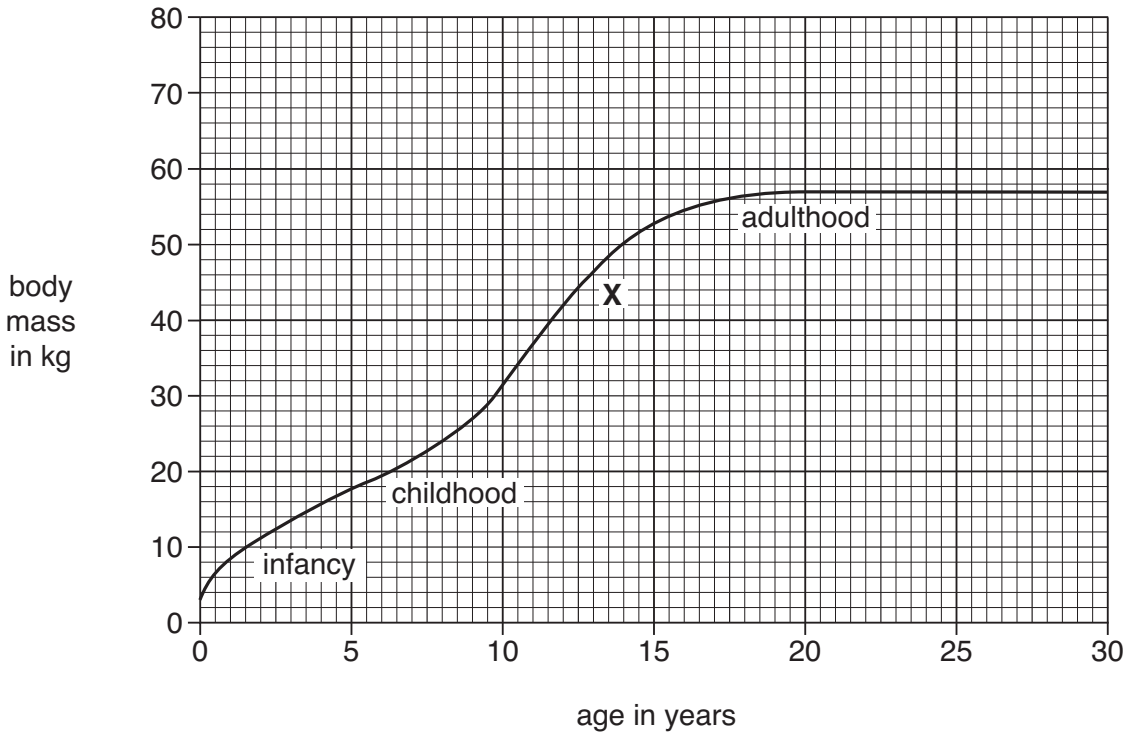
answer ..... **[1]**

[Total: 3]

8 Lucy has a record of her mass since she was born.

She is now 30 years old.

The graph shows her data.



(a) The graph shows how Lucy's mass has changed over the last thirty years.

At what age did Lucy stop growing?

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

(b) During the thirty years Lucy has gone through four different stages of growth.

Look at the graph.

Name the stage labelled with an **X**.

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

(c) Lucy's genes have had some control over how fast she has grown.

Write about **three other** factors that might have had an effect on how fast she has grown.

.....

.....

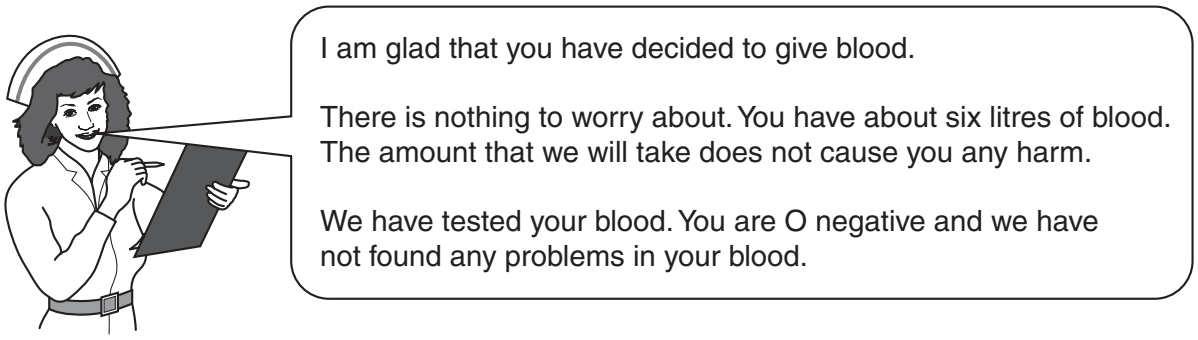
.....

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

[Total: 5]

9 Tony decides to donate blood.

The nurse in charge of the donation is talking to him.



(a) What might Tony's donated blood be used for?

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

(b) The nurse tells Tony that he is **O negative**.

What does this mean?

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

Tony is blood group O and free from disease.	☐
Tony is blood group O and Rhesus negative.	☐
Tony does not have a blood group and so can donate blood.	☐
Tony is blood group O and negative for platelets.	☐

[1]

(c) The nurse tells Tony that he has about six litres of blood.

How much is usually removed when blood is donated?

Put a (ring) around the correct amount in this list.

0.02 litres **0.5 litres** **2 litres** **4 litres**

[1]

(d) Tony's blood is tested for problems.

Suggest **one** problem that the blood might be tested for.

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

[Total: 4]

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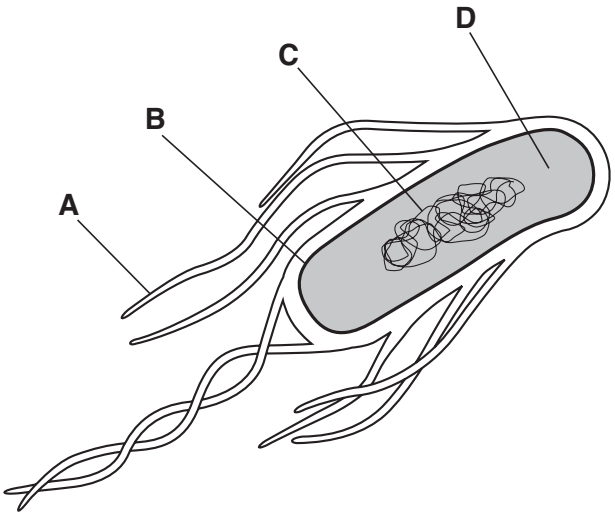
Section C – Module B6

10 (a) Sewage can contain bacteria called coliforms.

A coliform is shown in the diagram.



(i) Look at the diagram.

Which labelled part is a flagellum?

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

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

(ii) A coliform is 3 microns long in real life.

How long is a coliform in millimetres?

Put a (ring) around the correct size in this list.

3 thousandths of a millimetre (0.003 mm)

3 tenths of a millimetre (0.3 mm)

3 millimetres (3 mm)

300 millimetres (300 mm)

[1]

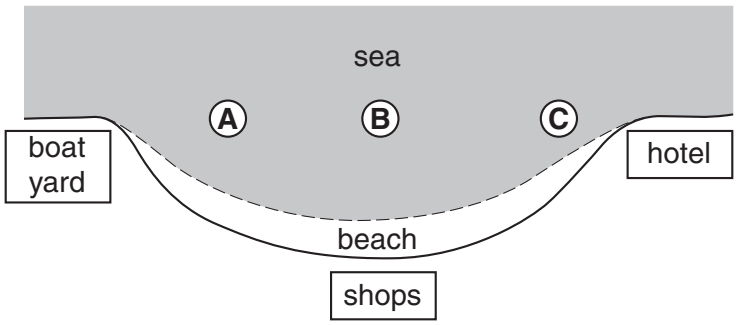
Turn over for the remainder of question 10

(b) Coliforms can be found in sea water if sewage is released into the sea.

The number of coliforms in the sea near beaches is measured.

This tells people if it is safe to swim.

The drawing shows an area around a beach.



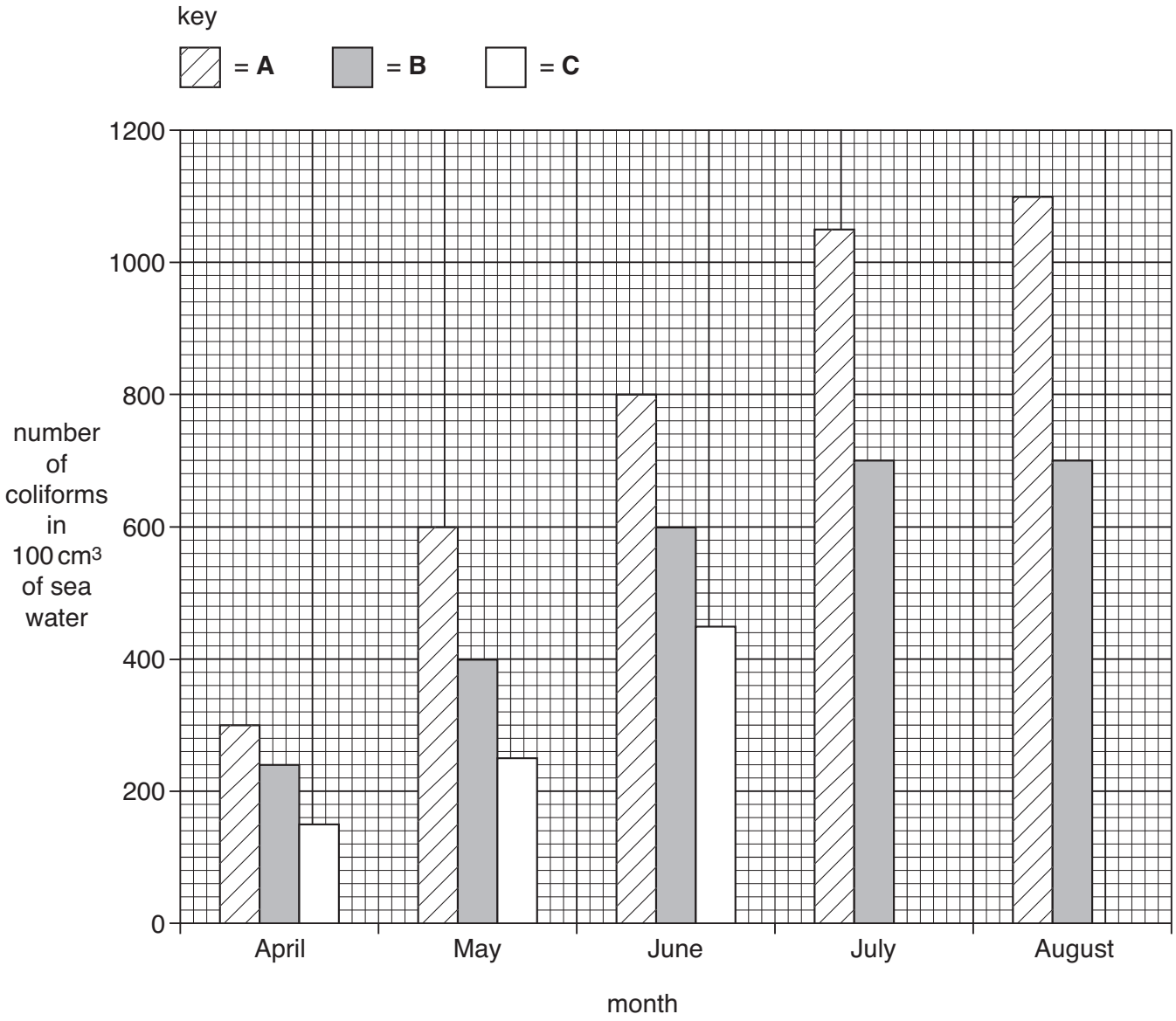
The sea water has been sampled at sites **A**, **B** and **C**.

The table shows the results for site **C**.

month	**number of coliforms at C in 100 cm^3 of water**
April	150
May	250
June	450
July	500
August	300

(i) The bar chart shows the number of coliforms found in the sea at sample sites **A**, **B** and **C**.

Use the information in the table to draw the **two** bars on the bar chart for site **C** in July and August. **[2]**



(ii) The beach is closed to people if the number of coliforms goes above 1000 in 100 cm^3 of water.

During which two months is the beach closed?

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

(iii) Scientists think that the sewage may be leaking from **one** of the three buildings near the beach.

Look at the graph and the drawing of the beach area.
Write down which building the sewage probably comes from.

Explain your answer.

building .....

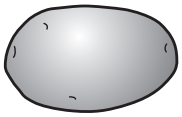
explanation .....

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

[Total: 6]

11 Read the article from a recent newspaper.

Fighting cholera with potatoes!



Cholera can spread very quickly from person to person.
It is a disease caused by bacteria.
It kills 200 000 people a year.

Scientists have used potato plants to make a new medicine.
They hope that this new medicine might stop people getting cholera.

The scientists put a gene into potato plants to make them produce the medicine.
They hope that just eating the potatoes will protect people from the disease.

(a) How are the bacteria which cause cholera spread?

.....

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

(b) What circumstances might make diseases such as cholera spread really quickly?

.....

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

(c) The scientists have put a gene from another species into the potato plant.

(i) Write down the name given to this type of process.

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

(ii) What name is given to an organism that has received a gene from another species?

Put a (ring) around the correct answer in this list.

clone

pathogen

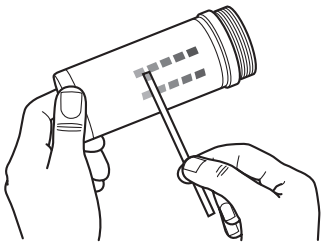
plasmid

transgenic

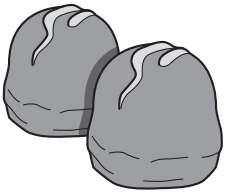
[1]

[Total: 4]

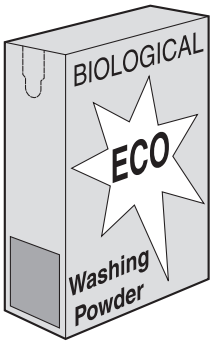
12 The diagrams show some products made using a type of biological molecule.



reagent testing strips for people with diabetes



chocolates low in sucrose



biological washing powder

(a) (i) The products all involve a type of biological molecule used to speed up reactions.

Write down the name of this type of biological molecule.

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

(ii) Explain what people with diabetes use reagent testing strips for.

.....

.....

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

(iii) The temperature and the pH of water in a washing machine may change.

Put a tick (✓) in the box next to the temperature **and** a tick (✓) in the box next to the pH at which the biological washing powder will work best.

low temperature (30 °C)	☐	acidic pH	☐
medium temperature (65 °C)	☐	neutral pH	☐
high temperature (100 °C)	☐	alkaline pH	☐

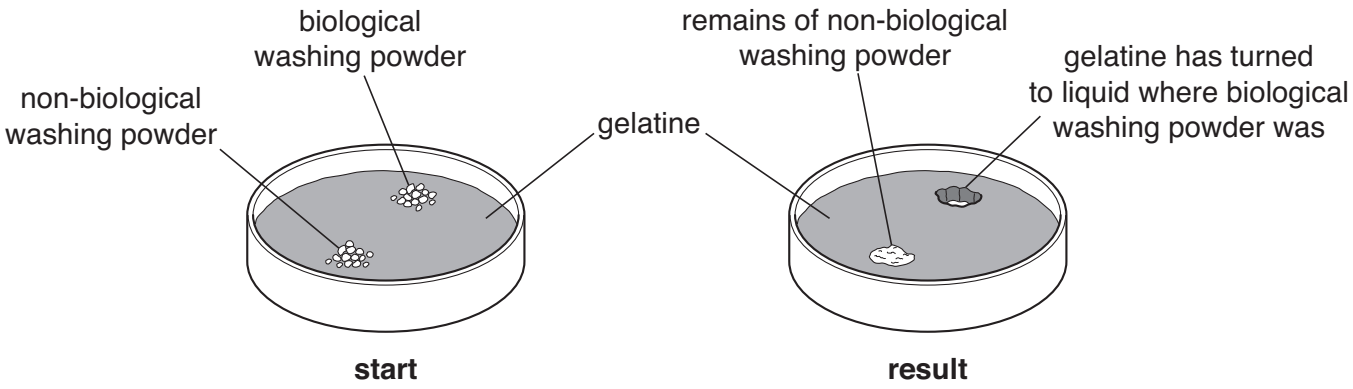
[1]

Turn over for the remainder of question 12

(b) Gerant decides to do an experiment to compare a biological washing powder with a non-biological powder.

He puts a small amount of each powder in a dish containing a jelly called gelatine.

Gelatine is a protein.



Explain the results of Gerant's experiment.

.....

.....

.....

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

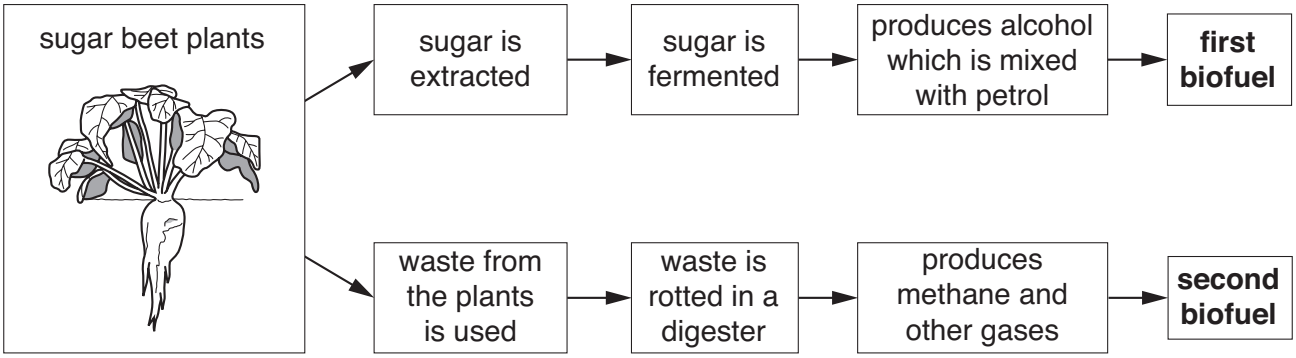
[Total: 6]

13 Sugar beet is a plant that is grown throughout Europe.

It is grown because it contains a high concentration of sugar.

Now a new factory is being built in Hungary.

It will use the plants to produce two different biofuels.



(a) To make the **first biofuel** a type of fungus will be used to ferment the sugar.

(i) Write down the name of this type of fungus.

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

(ii) What is the name of the first biofuel?

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

(b) The **second biofuel** containing methane will be used instead of natural gas to provide the energy to run the factory.

(i) What type of microorganism breaks down the sugar beet to make methane?

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

(ii) Write down **one** advantage of using this biofuel instead of natural gas.

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

[Total: 4]

END OF QUESTION PAPER

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