Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GENERAL CERTIFICATE OF SECONDARY EDUCATION

B632/01

GATEWAY SCIENCE
BIOLOGY B

Unit 2 Modules B4 B5 B6
(Foundation Tier)

MONDAY 25 JANUARY 2010: Afternoon
DURATION: 1 hour

SUITABLE FOR VISUALLY IMPAIRED CANDIDATES

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)

READ INSTRUCTIONS OVERLEAF

DC (NF/SW) MEP10230 24393/1

INSTRUCTIONS TO CANDIDATES

- **Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.**
- **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.**
- **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.**

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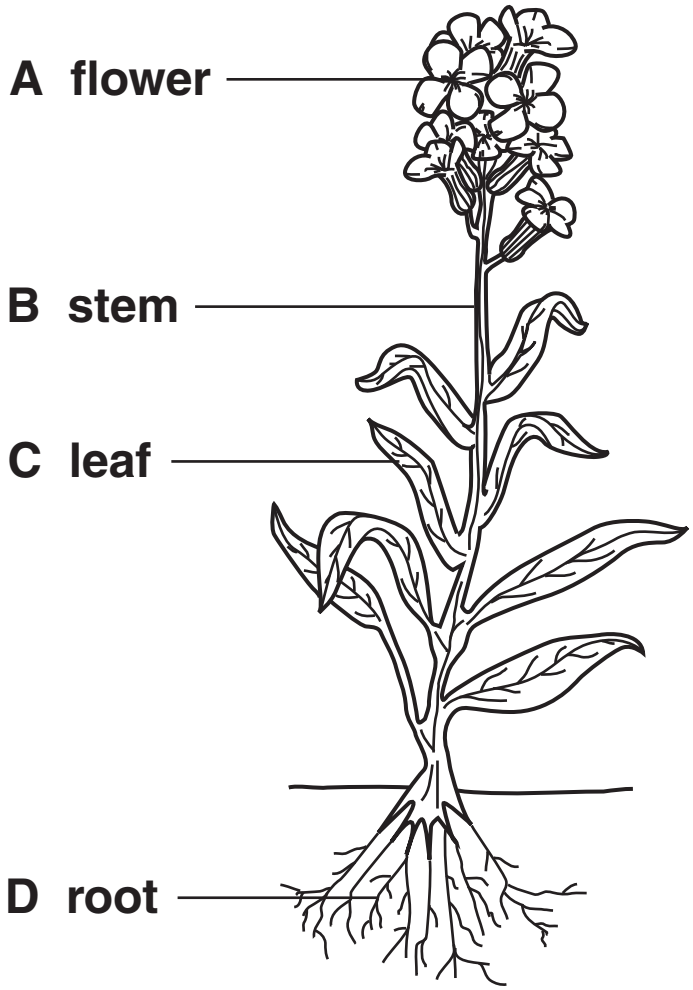
Answer ALL the questions.

SECTION A – MODULE B4

1 (a) Look at the diagram of a plant.



(i) Which part is where sexual reproduction happens in the plant?

Choose from A, B, C or D.

answer _____ **[1]**

(ii) What is the job of B?

_____ **[1]**

(b) Plants need minerals for healthy growth.

How does the plant get the minerals it needs?

_____ [1]

(c) The following was written on a bag of fertiliser.

Handle with care
Special CAMFERT fertiliser
Contents
N : P : K
25 : 15 : 10
50 kg

The contents written on the front of the fertiliser bag show the proportions of different elements in the fertiliser.

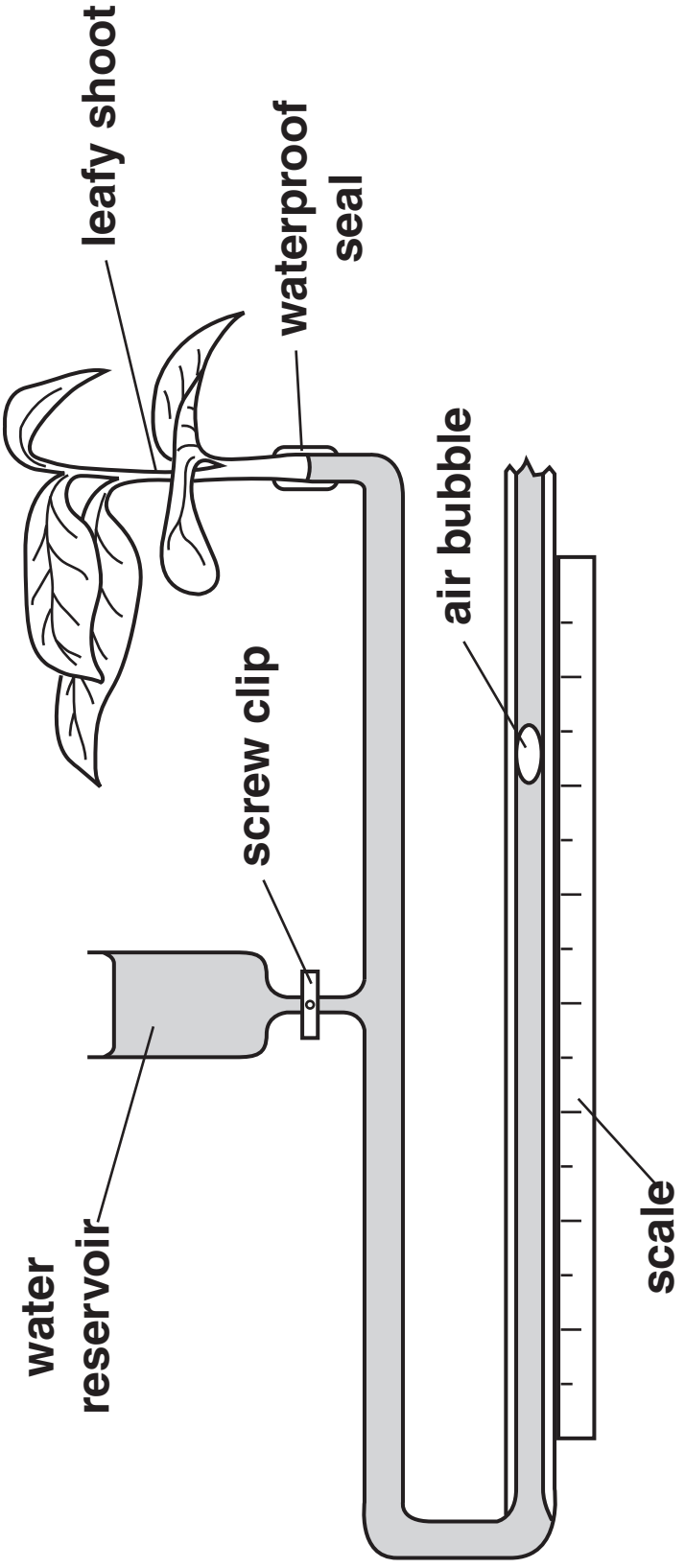
Write down the NAME of the chemical that makes up the largest amount of this fertiliser.

_____ [1]

[Total: 4]

2 **Mehmet uses this equipment to investigate water uptake in a leafy shoot.**

The distance moved by the air bubble shows the amount of water uptake.



Mehmet investigates how covering the leaf surfaces with grease affects water uptake.

Mehmet does three tests.

- In the first test he does NOT put grease on the leaves.
- In the second test he puts grease onto the TOP surface of the leaves.
- In the third test he puts grease onto the BOTTOM surface of the leaves.

For each test he measures the distance the air bubble moves.

(a) Mehmet's table of results is shown.

CONDITIONS	DISTANCE BUBBLE MOVED IN mm
no grease on the leaves	28
grease on top surface of the leaves	21
grease on bottom surface of the leaves	10

Covering the top surface reduces the distance the bubble moved by 7 mm.

Finish this sentence.

Covering the bottom surface reduces the distance the bubble moved by _____ mm. [1]

(b) The leafy shoot is taking up water because water is being lost from the leaves.

What is the name of the process by which plants lose water through their leaves?

_____ [1]

[Total: 2]

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3 Local Councils recycle household garden waste.

The Local Councils make large compost heaps.

(a) The list shows some items found in garden waste.

Which items will DECAY in a compost heap?

Put ticks (✔) in the boxes next to the TWO correct answers.

grass clippings	☐
plastic netting	☐
leaves from hedge trimming	☐
metal rings from plant supports	☐
broken stone pots	☐

[2]

(b) An activator can be added to the garden waste.

The activator contains living organisms which speed up decay.

Name a type of living organism that is needed for decay.

_____ [1]

(c) Local Councils turn over the waste several times as it decays.

This puts an important gas needed for decay into the compost heap.

Write down the name of this gas.

_____ [1]

[Total: 4]

4 **Sophie wants to be an ORGANIC cattle farmer.**

She knows she must keep her cattle on fields that are certified as organic by the Government.

(a) Describe what organic farming methods she must use on her fields.

In your answer write about

- **how Sophie could improve the growth of grass in her fields**
- **how Sophie can control weeds and pests in her fields.**

_____

_____

_____

_____

_____ **[3]**

(b) The animals and plants on Sophie's farm take in chemicals as they grow.

They build these into their bodies.

These chemicals contain two important elements that are recycled.

One of these elements is nitrogen.

What is the name of the other element?

Put a (ring) around the correct answer.

ARGON CARBON HELIUM URANIUM

[1]

[Total: 4]

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5 Graham grows tomatoes.

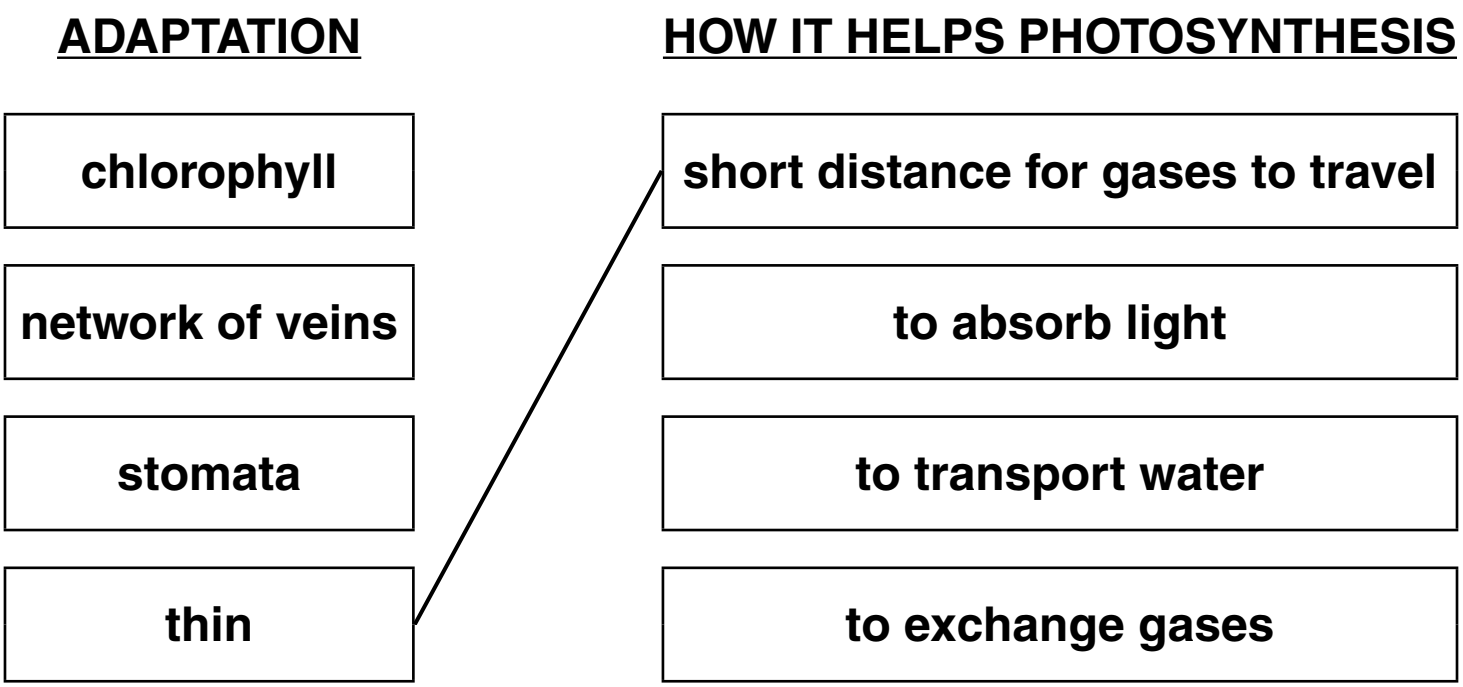
Tomato plants make food during a process called photosynthesis.

Photosynthesis occurs in plant leaves.

(a) Leaves are adapted for photosynthesis in several ways.

Draw straight lines to connect each ADAPTATION to HOW IT HELPS PHOTOSYNTHESIS.

One line has been drawn for you.



[2]

(b) Some of Graham's tomato crop has been damaged.

The damaged tomatoes are eaten by worms.

The worms are eaten by blackbirds.

The diagram (opposite) shows how energy flows through this food chain.

Look at the food chain.

(i) How much energy is lost from the food chain as energy is transferred from the tomato plants to the blackbirds?

_____ [1]

(ii) In this food chain the amount of energy transferred to the blackbirds when they feed on worms is less than the energy in the worms.

Explain why.

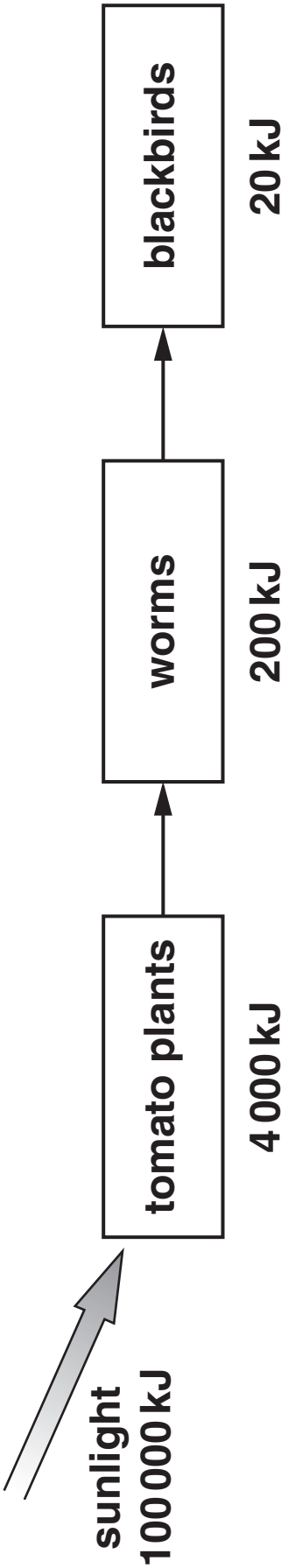
_____

_____ [1]

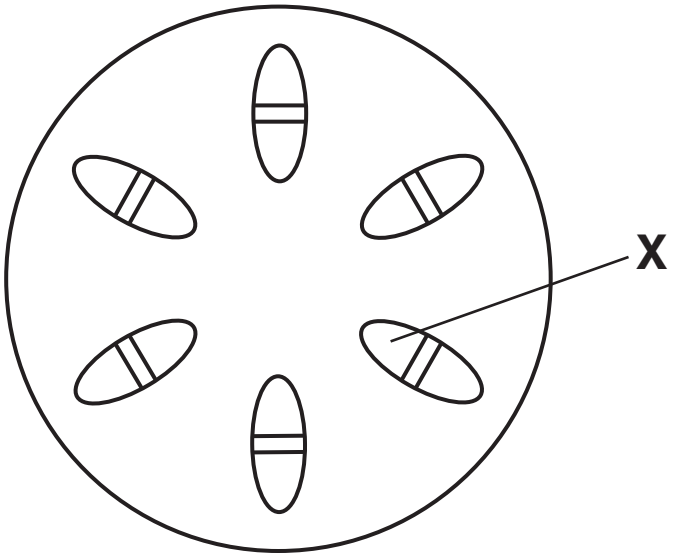
(c) Next year Graham plans to grow tomato plants using an intensive farming method called HYDROPONICS.

What is meant by the term hydroponics?

_____ [1]



(d) **The diagram shows a section through the stem of a tomato plant.**



Part X is the xylem.

Write down <u>ONE</u> job of the xylem in the tomato plant.

_____ **[1]**

[Total: 6]

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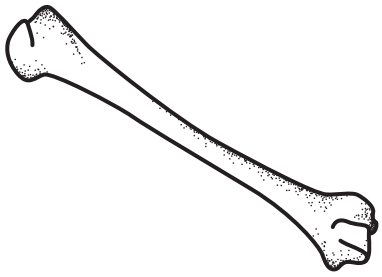
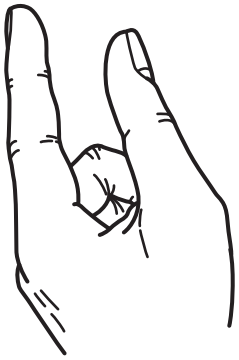
SECTION B – MODULE B5

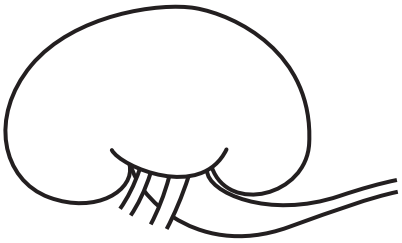
6 The diagrams show five organs from a human body.



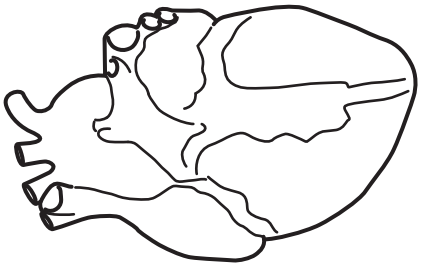
a bone



skin



kidney



heart

a muscle

(a) Answer the following questions.

Choose from the five organs.

(i) Which organ contains hair follicles?

_____ [1]

(ii) Which organ receives blood from the coronary artery?

_____ [1]

(iii) Which TWO organs may be joined together by a tendon?

_____

and _____ [1]

(b) Sometimes a person's heart does not work properly.

(i) Name ONE heart condition or heart disease.

_____ [1]

(ii) A person may need to wait a long time for a donor heart.

Write down <u>TWO</u> reasons why there is a shortage of suitable donor hearts.

_____

_____

_____

_____ **[2]**

[Total: 6]

7 Some women find it difficult to get pregnant.

(a) They may use IVF to try and get pregnant.

What is IVF short for?

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

intra vaginal fertilisation	☐
in vitro fertilisation	☐
in vivo fertilisation	☐
intravenous fertilisation	☐

[1]

(b) IVF involves taking eggs from the women just before ovulation happens.

(i) Write down the name of the organ in a woman's body that makes eggs.

_____ [1]

(ii) Write down what normally happens in a woman's body at ovulation.

_____ [1]

(c) The egg is then fertilised and put back into the woman to grow into a baby.

(i) What is added to the egg to fertilise it?

_____ [1]

(ii) **Write down the name of the type of cell division that takes place as the baby grows.**

_____ **[1]**

[Total: 5]

8 (a) The lungs are important organs in the body.

A gas from the air passes into the blood in the lungs.

This gas is needed for respiration.

(i) Write down the name of this gas.

_____ [1]

(ii) The lungs are also used for excretion.

Write down the name of the gas which is excreted by the lungs.

_____ [1]

(b) Sometimes the lungs do not work properly.

This happens when a person has an asthma attack.

(i) What treatment is available when a person has an asthma attack?

_____ [1]

(ii) **A new treatment is being tested that might help prevent asthma attacks (see opposite).**

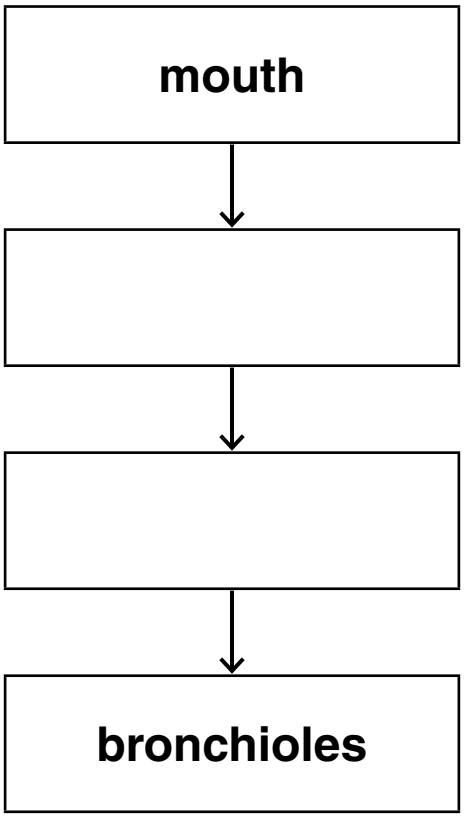
A tube is passed down the airways leading to the lungs.

The tip of the tube then heats up.

This weakens the muscles in the walls of the airways.

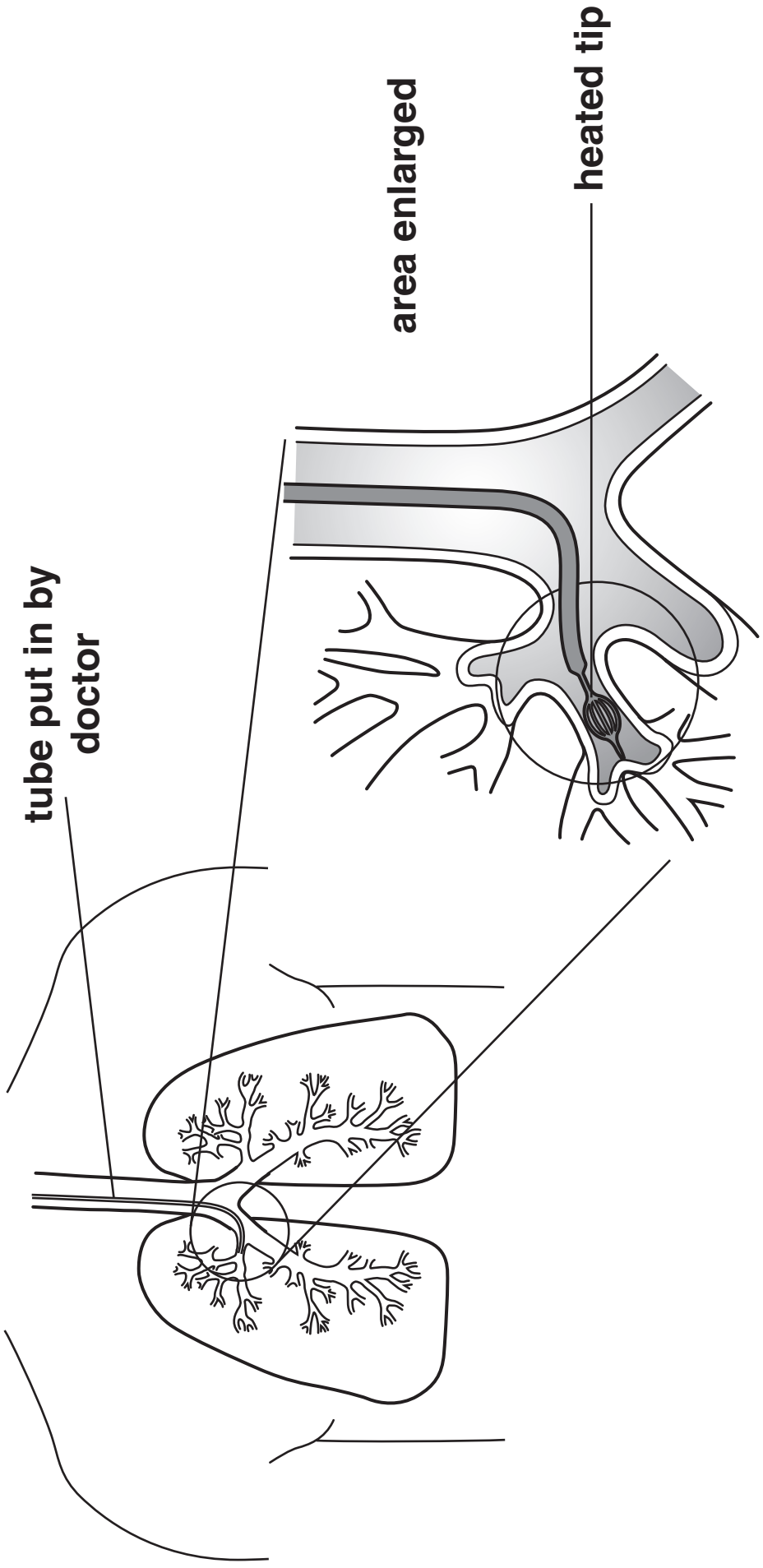
The flow chart shows the order of the airways that the tube passes through.

Write down the <u>TWO</u> missing names.



[2]

[Total: 5]



9 Read the following information about blood transfusions.

The first doctor to try a blood transfusion between two people was Dr Blundell in 1818.
He took blood from a person and injected it into his patient.
He did this quickly so that the platelets would not clot the blood.
Unfortunately he did not know about blood groups and so his transfusions often did not work.
He also carried out the first transfusion to try and cure haemophilia.

In 1901 Dr Landsteiner discovered blood groups.
He said that there were three, A, B and O.
This helped to make blood transfusions safer.

(a) Dr Blundell was worried that a part of the blood might cause it to clot.

Write down the name of this part of the blood.

_____ [1]

(b) What type of drug can be added to blood to stop it clotting?

_____ [1]

(c) Dr Landsteiner first thought that there were three main blood groups, A, B and O.

Write down the main group he missed out.

_____ [1]

(d) Dr Blundell tried to cure a case of haemophilia with a transfusion.

Put a tick (✔) in the box next to the <u>BEST</u> description of haemophilia.

A genetic condition that makes the blood clot easily.	☐
Blood clotting in blood vessels due to long aeroplane journeys.	☐
A bacterial infection that causes blood clots in arteries.	☐
An inherited condition that prevents blood clotting easily.	☐

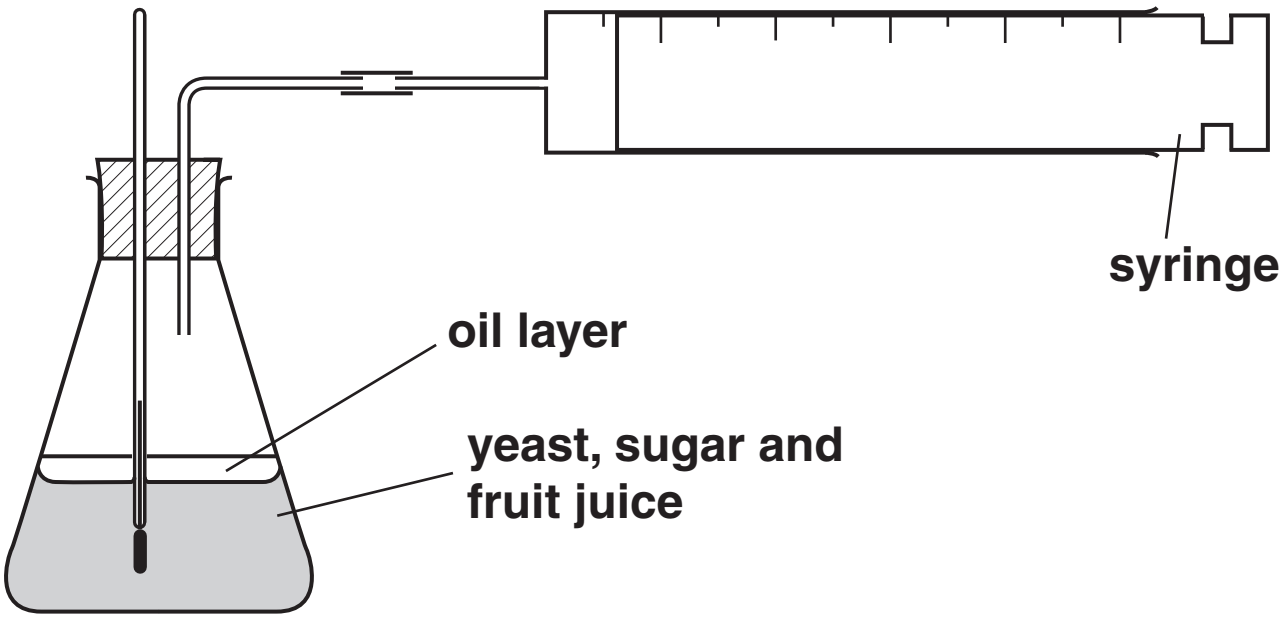
[1]

[Total: 4]

SECTION C – MODULE B6

10 Kevin and Sam investigate the best way to make cider.

The diagram shows the apparatus they use to collect the carbon dioxide.



(a) The yeast breaks down the sugar to make alcohol and carbon dioxide gas.

Write down the name of this process.

Choose from the list.

DIGESTION	**FERMENTATION**
PHOTOSYNTHESIS	**REPRODUCTION**

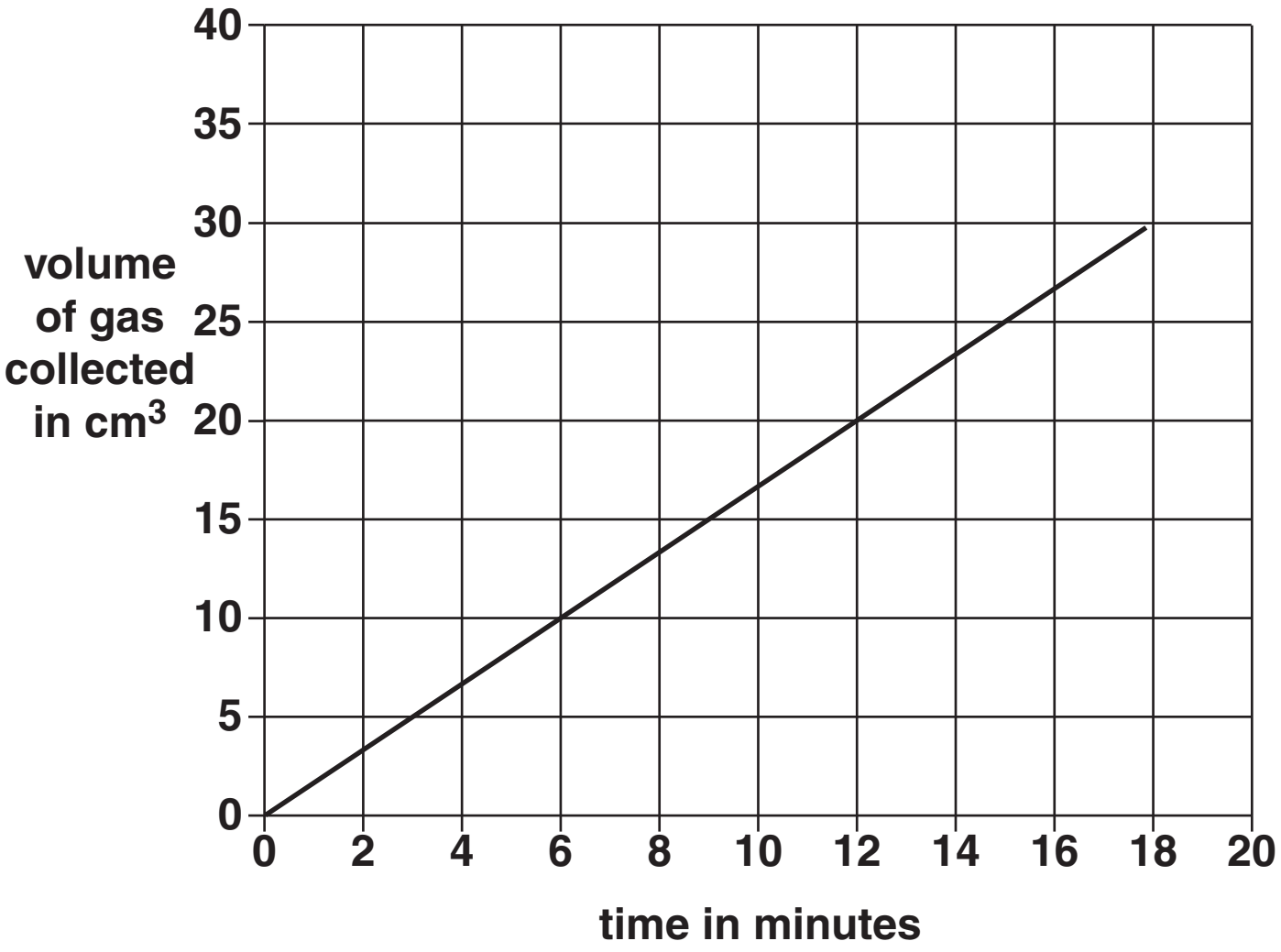
answer _____ **[1]**

(b) Write down the type of fruit used to make cider.

_____ [1]

(c) Look at the graph.

It shows their results when they collect the gas at 20 °C.



(i) How long did it take to collect 20 cm^3 of gas?

_____ minutes [1]

(ii) Kevin and Sam repeat the investigation at 30 °C.

Draw a line on the graph to predict their results. [1]

(d) Alcohol can be mixed with petrol and used as biofuel.

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

_____ [1]

(ii) Write down ONE advantage of using this biofuel instead of petrol.

_____

_____ [1]

[Total: 6]

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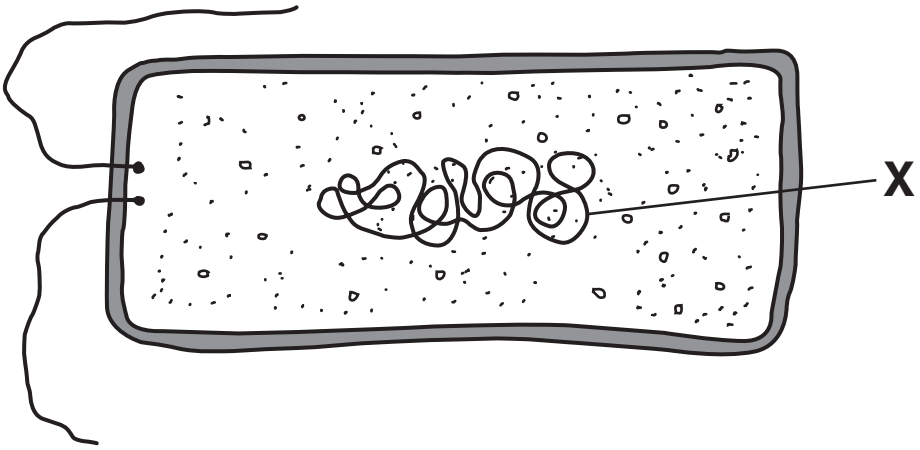
11 Look at the diagram of a bacterial cell.



(a) Write down the name of the part labelled X.

_____ **[1]**

(b) Bacteria can be used to make cheese.

Write down one <u>OTHER</u> use of bacteria.

Choose from the list.

<u>MAKING BEER</u> **<u>MAKING WINE</u>**

<u>MAKING YOGHURT</u>

answer _____ **[1]**

(c) Bacteria can cause disease.

Write down ONE disease caused by bacteria.

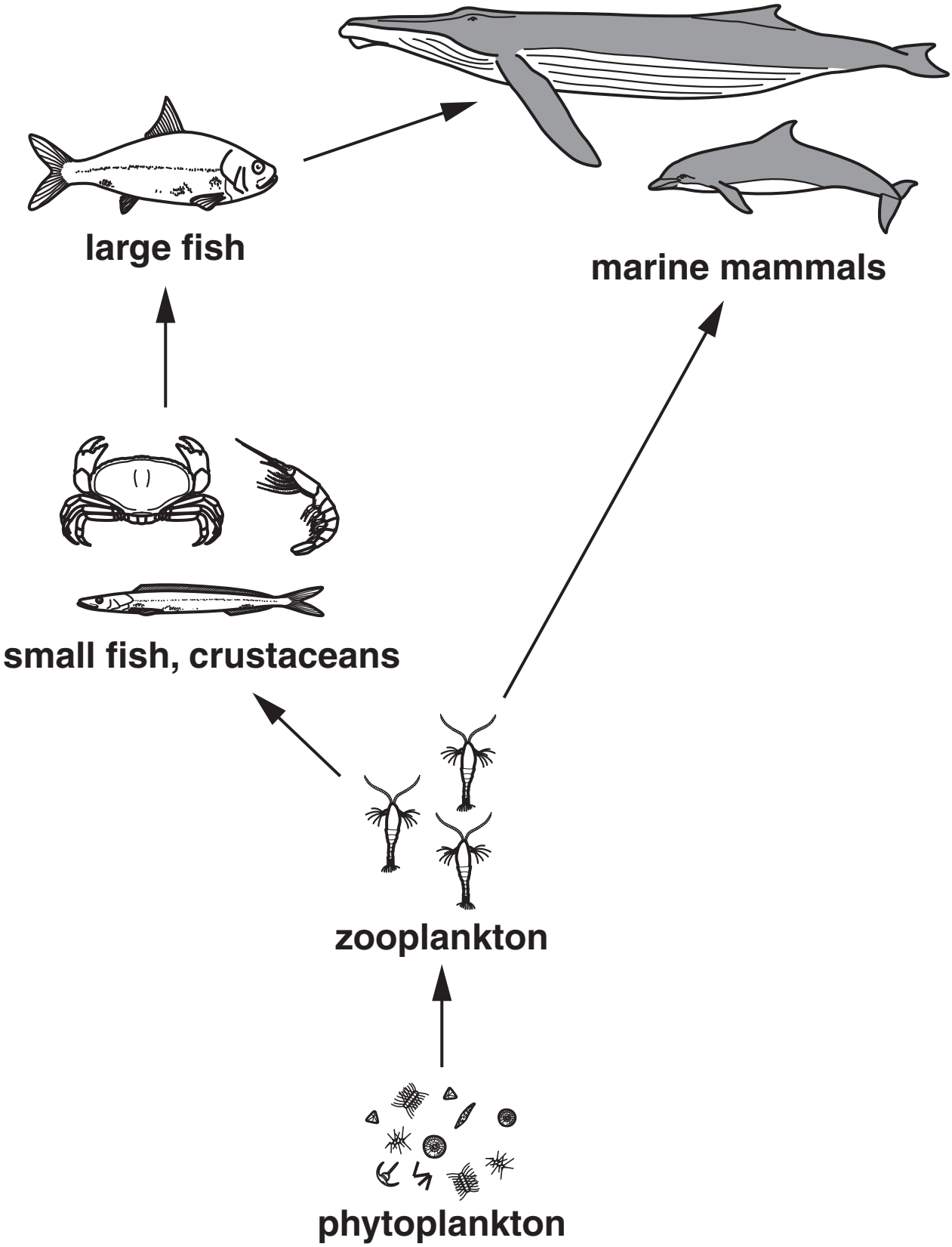
Choose from the list.

INFLUENZA FOOD POISONING MALARIA

answer _____ [1]

[Total: 3]

12 Look at the diagram of a seawater food web.



(a) Which organism is the PRODUCER in this food web?

Put a ring around the correct answer.

LARGE FISH MARINE MAMMAL

PHYTOPLANKTON ZOOPLANKTON

[1]

(b) Numbers of producers increase in the summer.

Explain why.

_____

_____

_____ [2]

(c) Large marine mammals sometimes get washed up on the beach.

They often die because they become crushed by their own weight.

Explain why living in water stops their weight crushing them.

_____

_____ [1]

[Total: 4]

13 This question is about enzymes.

(a) Enzymes have many uses.

(i) Enzymes are used in the food industry to make sugars sweeter.

Write down ONE OTHER use of enzymes in the food industry.

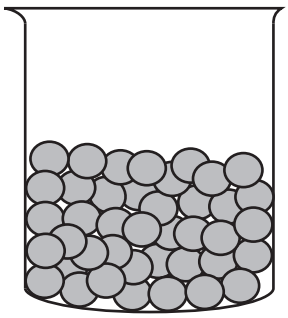
_____ [1]

(ii) Enzymes are present in diabetic reagent sticks.

Write down what people with diabetes use reagent sticks for.

_____ [1]

(b) Look at the picture. It shows beads of immobilised sucrase (invertase) enzyme.



(i) Which chemical can be used to make these beads?

Put a (ring) around the correct answer.

ALGINATE LIPASE PESTICIDE PCBs

[1]

(ii) The sucrase beads can be added to sucrose solution.

The sucrose is broken down into sweeter tasting sugars.

Write down <u>ONE</u> advantage of using <u>IMMOBILISED</u> sucrase instead of sucrase solution.

_____

_____ [1]

(c) Bacteria can be genetically engineered to make enzymes.

There are many other uses of genetic engineering.

Read the following information about genetic engineering.

Fireflies are insects that light up in the dark. They have a gene to make a chemical called Luciferin. Scientists have removed this gene from the firefly and added it to cancer cells. This changes the genetic code of the cells making them glow.

Light causes a reaction that then kills the cancer cells. Healthy cells do not have the gene so they are unharmed.

Use the information to finish the sentences.

Use ONE word to fill each space.

Genetic engineering alters the genetic _____ of the cancer cells.

This genetic engineering of the cancer cells involves removing a _____ from fireflies.

The cancer cells are killed because they make _____ . **[3]**

[Total: 7]

END OF QUESTION PAPER