OCR
RECOGNISING ACHIEVEMENT

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**GENERAL CERTIFICATE OF SECONDARY EDUCATION** **B632/01**

**GATEWAY SCIENCE**

**BIOLOGY B**

Unit 2 Modules B4 B5 B6 (Foundation Tier)

**TUESDAY 17 JUNE 2008**

Morning
Time: 1 hour

*CUP/T52546*

Candidates answer on the question paper.
**Additional materials (enclosed):**
None

Calculators may be used.
**Additional materials:** Pencil
Ruler (cm/mm)

| Candidate Forename | | Candidate Surname | |
|---|---|---|---|

| Centre Number | | | | | | Candidate Number | | | | |
|---|---|---|---|---|---|---|---|---|---|---|

**INSTRUCTIONS TO CANDIDATES**

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or 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.

**INFORMATION FOR CANDIDATES**

- The number of marks for each question is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **60**.

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

This document consists of **19** printed pages and **1** blank page.

Answer **all** the questions.

## Section A – Module B4

**1** Matt has a compost heap in his garden.

He fills it with dead leaves and grass cuttings which decay to form compost.

**(a)** Write down the name of **one** type of microorganism that causes the dead leaves and grass cuttings to decay.

..... [1]

**(b)** Matt notices that the things in the compost heap decay faster at some times than at others.

**(i)** Why do things decay faster in the summer compared to the winter?

..... [1]

**(ii)** Matt regularly digs the compost heap over with a spade.

Why does this make things decay faster?

..... [1]

**(c)** Matt's neighbour tells him he should put kitchen waste, such as vegetable peelings, on the compost heap.

Matt is not sure whether to put other waste, such as plastic food containers, on the compost heap.

Should he put plastic food containers on the compost heap? .....

Explain your answer. .....

..... [1]

[Total: 4]

**2** Chris is a farmer.

**(a)** Chris has a problem because insects are eating her plant crops.

She is thinking about using a chemical to kill these insects.

Which type of chemical should she use?

Put a (ring) around the correct answer.

**fungicide** **herbicide** **pesticide**

[1]

**(b)** Chris decides to use organic farming methods to stop the insects.

She decides to use **biological control**.

What is biological control?

.....

..... [1]

**(c)** Chris also uses fertilisers. These help her crops grow.

Choose **two** substances you would expect to find in fertiliser.

Put (rings) around the **two** correct answers.

**carbon dioxide**

**chlorophyll**

**phosphate**

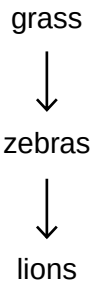
**potassium**

**sugar**

[2]

[Total: 4]

**3** Look at the food chain found in Africa.




**(a)** **(i)** Grass is the producer in this food chain.

What does the word **producer** mean?

.....

..... [1]

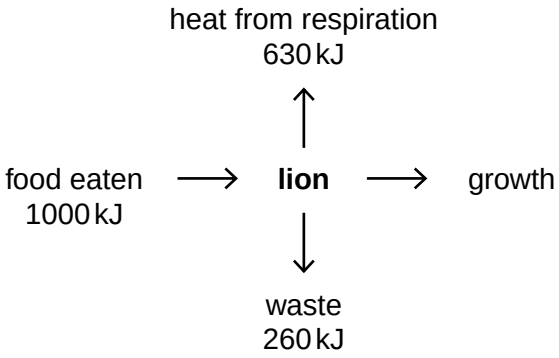
**(ii)** The zebras and lions are consumers in this food chain.

What does the word **consumer** mean?

.....

..... [1]

**(b)** The diagram shows how a lion transfers energy.




**(i)** For every 1000 kJ of food energy, how much energy does the lion use for growth?

..... kJ [1]

**(ii)** For every 1000 kJ of food energy, the amounts of energy that a lion cub transfers as heat, growth and waste are different from an adult lion.

Suggest **one** way that the amounts of energy a lion cub transfers would be different from an adult lion.

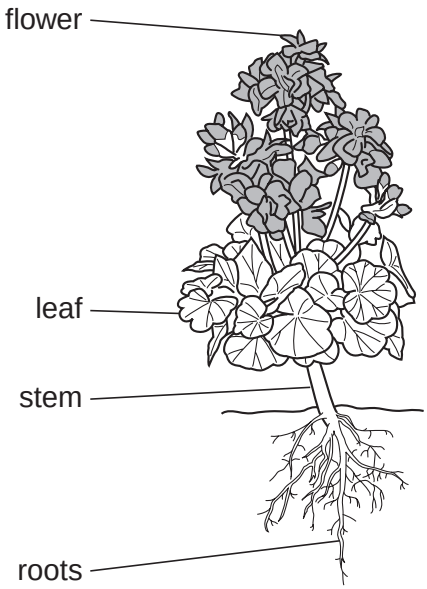
.....

Explain your answer. .....

..... [1]

[Total: 4]

**4** Kate is growing geraniums in her garden.




**(a)** Draw a straight line to match each **part of a plant** with its **job**.

One has been done for you.

| part of plant | job |
|---|---|
| flower | anchorage |
| leaf | photosynthesis |
| root | reproduction |
| stem | support |

[2]

**(b)** Geranium leaves are adapted for efficient photosynthesis.

Describe **two** ways leaves are adapted for efficient photosynthesis.

1 .....

.....

2 .....

..... [2]

**(c)** Plants lose water from their leaves. This is called transpiration.

Describe how transpiration happens.

.....

.....

..... [2]

**(d)** Kate wants to put one of her geraniums in a pot.
She digs up one of them.
Unfortunately many of the roots break off.
She plants the geranium in a pot.
However, even though she waters it regularly, the geranium wilts (droops).

Explain why it wilts.

.....

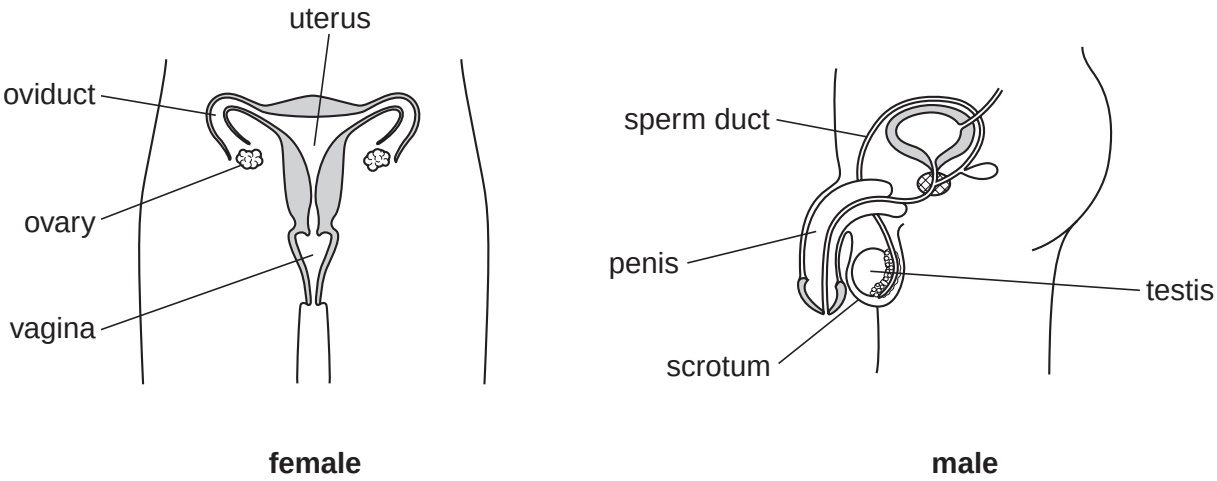
.....

..... [2]

[Total: 8]

## Section B – Module B5

**5** The diagram shows the female and male reproductive systems.




**female** **male**

**(a)** Bob and Mary want to have children.
However, they have not been able to have any yet.
They go to see their doctor for fertility advice.

The doctor says that perhaps Mary's eggs are not being fertilised.

What does **fertilisation** mean?

.....

..... [2]

**(b)** The doctor says that perhaps Bob is not producing enough healthy sperm cells.

Which part of his reproductive system may not be producing enough healthy sperm cells?

Choose your answer from the diagram.

..... [1]

**(c)** Mary is given a hormone to make her produce more eggs.

Which part of her reproductive system will the hormone affect so she can produce more eggs?

Choose your answer from the diagram.

..... [1]

[Total: 4]

**6** This question is about the blood system.

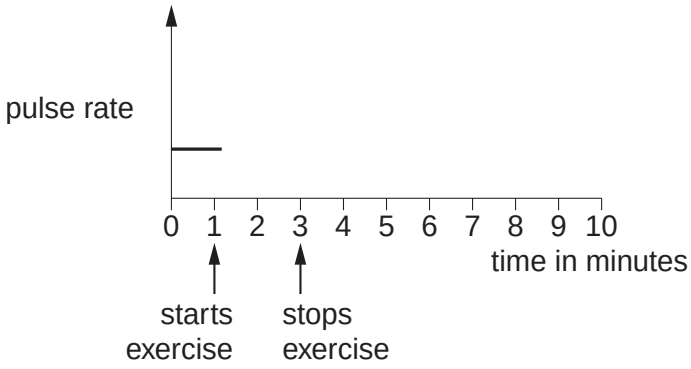
**(a)** Paul is investigating his pulse rate.
He waits until he has been sitting still for 10 minutes.
He then counts the pulse in his wrist.
He counts 17 pulses in 15 seconds.

What is his pulse rate per minute?

..... per minute [1]

**(b)** Paul then exercises for two minutes by running around the school field.
He then sits down again and measures his pulse rate every minute.
After another five minutes his pulse rate returns to normal.

How would you expect Paul's pulse rate to change when he exercises and then sits down?
Show your answer by completing the line on the graph.




[2]

**(c)** Your pulse is caused by your heart beating.
Sometimes the heart does not work properly and has to be treated.

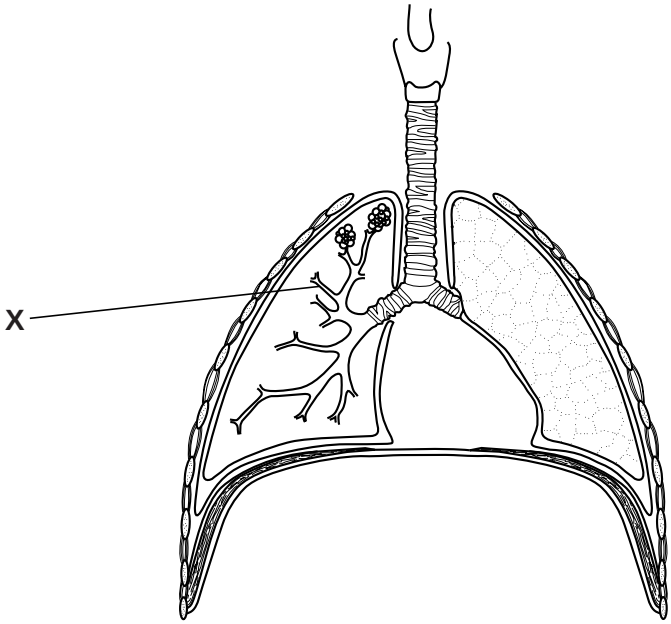
Draw a straight line to match each **heart condition** with its correct **treatment**.
Draw **two** lines only.

| heart condition | treatment |
|---|---|
| blocked coronary artery | artificial replacement |
| damaged valves | bypass surgery |
| | pacemaker |

[2]

[Total: 5]

**7** **(a)** Look at the diagram of the breathing system.




What is the name of part **X**?

Put a ring around the correct answer.

**air sac** **bronchiole** **bronchus** **trachea**

[1]

**(b)** The breathing system is sometimes called the respiratory system.

However, breathing and respiration are **not** the same thing.

**(i)** What does **breathing** mean?

.....

..... [1]

**(ii)** What does **respiration** mean?

.....

..... [1]

**(c)** The breathing system is also involved in excretion.

Write down **one** substance that is excreted by the breathing system.

..... [1]

[Total: 4]

**8** This question is about skeletons.

**(a)** Look at the list.

**cartilage** **external** **internal** **ligaments** **tendons**

Finish the following sentences by choosing the best words from the list.

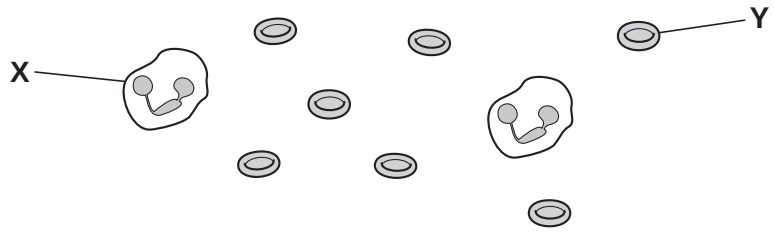
Human skeletons are made of bone and …… .

At joints, bones are held together by …… .

The type of skeleton humans have is called an …… skeleton. [3]

**(b)** Blood cells are made in bone marrow.

Look at the diagram of some blood cells.




**(i)** What type of cell is cell **X**?

..... [1]

**(ii)** What type of cell is cell **Y**?

..... [1]

**(c)** Lynne is ill.

She needs a bone marrow transplant from a donor.

Write down **two** things that would make someone a suitable donor.

1 .....

.....

2 .....

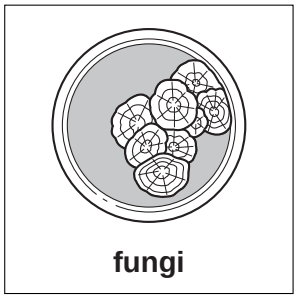
..... [2]

[Total: 7]

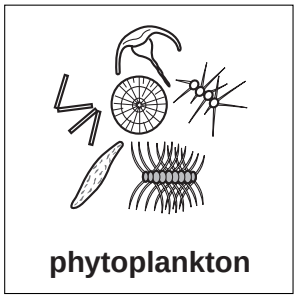
## Section C – Module B6

**9** The diagrams show different types of organisms.

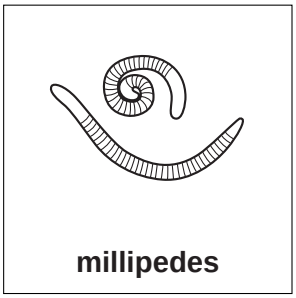
They are not drawn to the same scale.



**fungi**

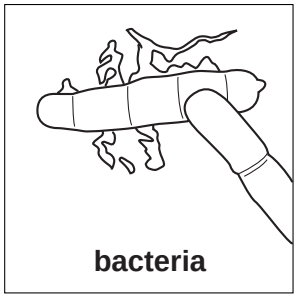


**phytoplankton**

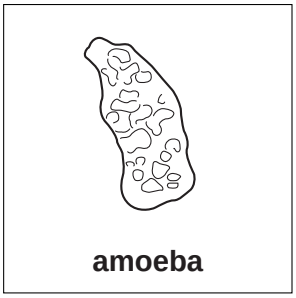


**millipedes**

**zooplankton**



**bacteria**



**amoeba**

**(a)** Answer the questions by choosing from the organisms in the diagrams.

**(i)** Write down the name of the organism which is a producer in seas and lakes.

..... [1]

**(ii)** Write down the name of the organism which causes athlete's foot.

..... [1]

**(iii)** Write down the name of the organism which is used to make yoghurt.

..... [1]

**(b)** Sir Alexander Fleming made an important discovery involving two of these types of organisms.

Describe Alexander Fleming's discovery.

.....

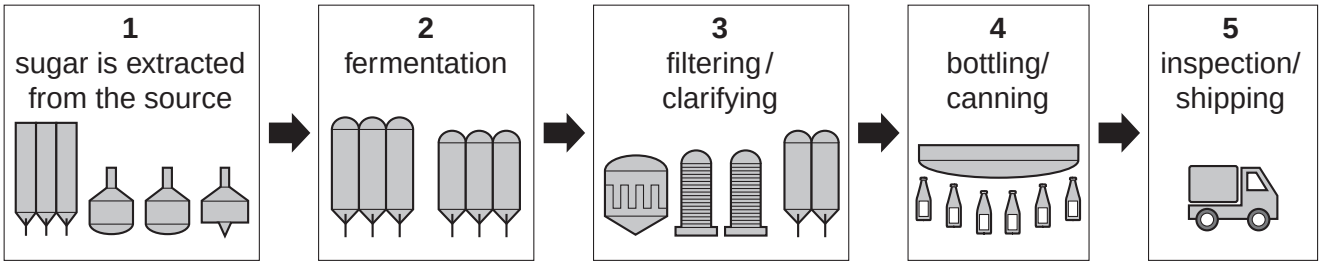
.....

.....

..... [2]

[Total: 5]

**10** The diagram shows some steps in beer making.




**(a)** In step **1**, sugar is extracted from the source material.

What is the source material in beer making?

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

**apples** **cane sugar** **grapes** **malted barley**

[1]

**(b)** In step **2**, a gas is produced.

Write down the name of this gas.

..... [1]

**(c)** In step **2**, the fermentation is caused by yeast.

What type of microorganism is yeast?

..... [1]

**(d)** In which step, **1**, **2**, **3**, **4** or **5**, is the yeast removed from the beer?

..... [1]

[Total: 4]

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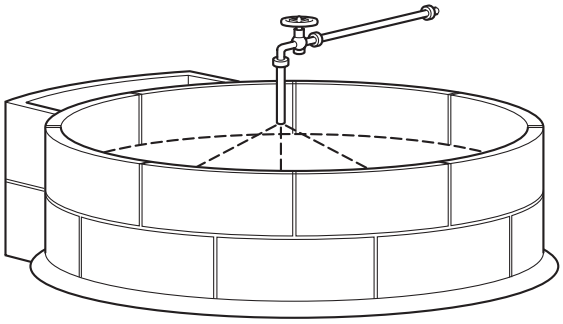
**11** Biogas is a mixture of gases that can be used as a fuel.

It is often used in remote parts of the world.

The diagram shows a container that is used to make biogas.



**(a)** What is this type of container usually called?

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

**digester** **food processor** **incubator** **pasteuriser**

[1]

**(b)** Write down **one** material that could be put in the container to produce biogas.

..... [1]

**(c)** Biogas is particularly important to people living in the remote parts of the world.

Write down **one** reason why.

.....

..... [1]

**(d)** Biogas contains a mixture of gases.

Write down the name of the main gas in biogas.

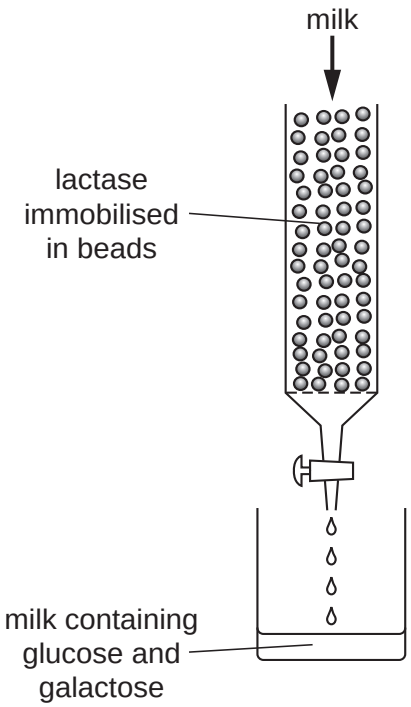
..... [1]

[Total: 4]

**12** Enzymes have many uses.

Some enzymes can be immobilised (trapped) in beads.

One type of immobilised enzyme is used to break down the sugar in milk.




**(a)** What chemical can be used to make the beads?

Put a (ring) around the correct answer.

**alginate** **antibiotic** **detergent** **PCBs**

[1]

**(b)** The sugar in milk can be broken down by adding the enzyme to a beaker of milk.

Write down **one** reason why it might be better to use the immobilised enzyme.

.....

..... [1]

**(c)** People with diabetes might use immobilised enzymes.

What do they use them for?

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

| | |
|---|---|
| to digest all starch before they eat it | ☐ |
| to measure the level of protein in their urine | ☐ |
| to measure the level of glucose in their blood | ☐ |
| to alter the flavour of their food | ☐ |

[1]

[Total: 3]

**13** Read the article that appeared in a recent newspaper.

## Chickens with valuable eggs

A group of scientists have produced chickens that lay eggs containing an anti-cancer protein.
This was done using **genetic engineering**.

The scientists looked at the human **genetic code** and found a human gene that makes an anti-cancer protein.
They 'cut' this gene out of a human **chromosome** and put it into a male chick.

The chick grew up, mated and produced many chickens.
Some of these laid eggs containing the anti-cancer protein.

**(a)** The article uses some terms used in genetics.

Draw straight lines to link each **term** to its **meaning**.

| term | meaning |
|---|---|
| chromosome | the pattern of information that is carried on DNA |
| genetic code | a structure in a cell that contains DNA |
| genetic engineering | a process that changes the genes of an organism |

[2]

**(b)** The chickens had their genes altered to make the anti-cancer protein.

**(i)** What is the name given to an organism that has had a new gene put into it?

..... [1]

**(ii)** One use of organisms that have had their genes changed is to make medicines.

Write down **one other** use of organisms that have had their genes changed.

..... [1]

[Total: 4]

**END OF QUESTION PAPER**

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