Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

2540457564

BIOLOGY **0610/33**

Paper 3 Theory (Core) **May/June 2019**

1 hour 15 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

This syllabus is regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **18** printed pages and **2** blank pages.

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[Turn over

1 **(a)** Several processes occur in the alimentary canal.

(i) The boxes on the left show the names of processes that occur in the alimentary canal.

The boxes on the right show descriptions of processes that occur in the alimentary canal.

Draw **five** straight lines to link each process with its description.

process	description
	breakdown of food into smaller pieces
absorption	
	breakdown of large, insoluble molecules into small, soluble molecules
chemical digestion	
	movement of digested food molecules into cells
egestion	
	movement of small food molecules and ions into the blood
ingestion	
	passing out of food that has not been digested or absorbed
mechanical digestion	
	taking of substances into the body

[5]

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(ii) State the name of **one** type of digested food molecule that is absorbed.

..... [1]

(b) The cholera pathogen produces a toxin which affects part of the alimentary canal.

(i) State the type of pathogen that causes cholera.

..... [1]

(ii) One of the symptoms of cholera is diarrhoea.

Describe what is meant by the term *diarrhoea*.

.....

.....

..... [1]

(iii) Outline the treatment for diarrhoea.

.....

.....

.....

.....

..... [2]

[Total: 10]

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[Turn over

2 **(a)** Transpiration is the loss of water from plant leaves.

Complete the sentences using the words and phrases from the list.

Each word or phrase may be used once, more than once or not at all.

active transport **condenses** **cortex** **diffusion**

evaporates **flows** **gas** **guard**

liquid **osmosis** **root hair**

stomata **spongy mesophyll** **water vapour**

Water on the surface of ..... cells

..... .

The water vapour moves out of the leaf by ..... into the

atmosphere through openings in the leaf called ..... .

[4]

(b) A student compared the mass of water lost from four leaves.

Four similarly-sized leaves were collected from the same plant.

Some of the surfaces of the leaves were covered with a waterproof substance. The mass of each leaf was measured.

The leaves were hung on a piece of string, as shown in Fig. 2.1. The leaves were left for several hours and the mass of each leaf was measured again.

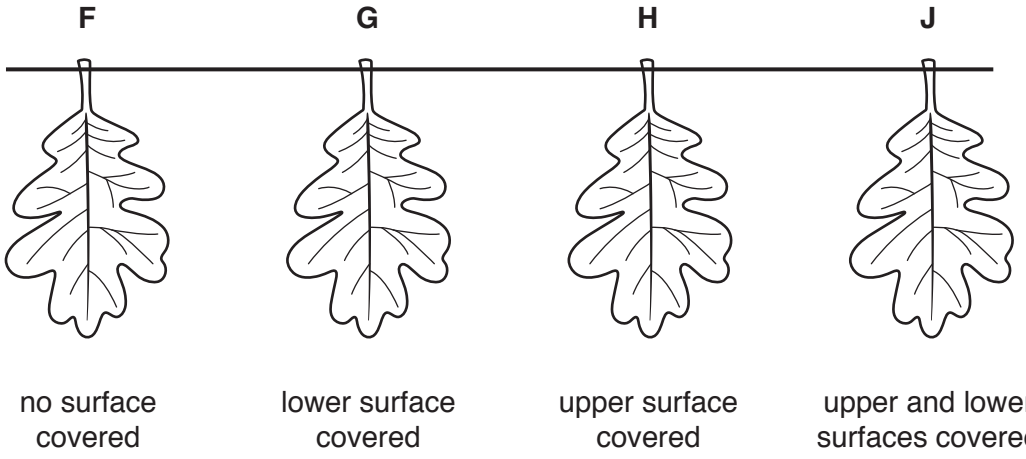


Fig. 2.1

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The results from the experiment are shown in Table 2.1.

Table 2.1

leaf	mass at the start/g	mass at the end/g	difference in mass/g
F	0.67	0.40	
G	0.70	0.67	0.03
H	0.69	0.44	0.25
J	0.73	0.73	0.00

(i) Calculate the difference in mass for leaf **F** and write your answer in Table 2.1. [1]

(ii) Describe how the different treatments of the leaves affected their loss of mass.

Use the information in Fig. 2.1 and Table 2.1 to support your answer.

.....

.....

.....

.....

.....

.....

..... [3]

(iii) Suggest a reason for the difference in mass lost between leaves **G** and **H**.

.....

.....

..... [1]

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[Turn over

(c) Fig. 2.2 is a photomicrograph of a cross-section of part of a leaf.

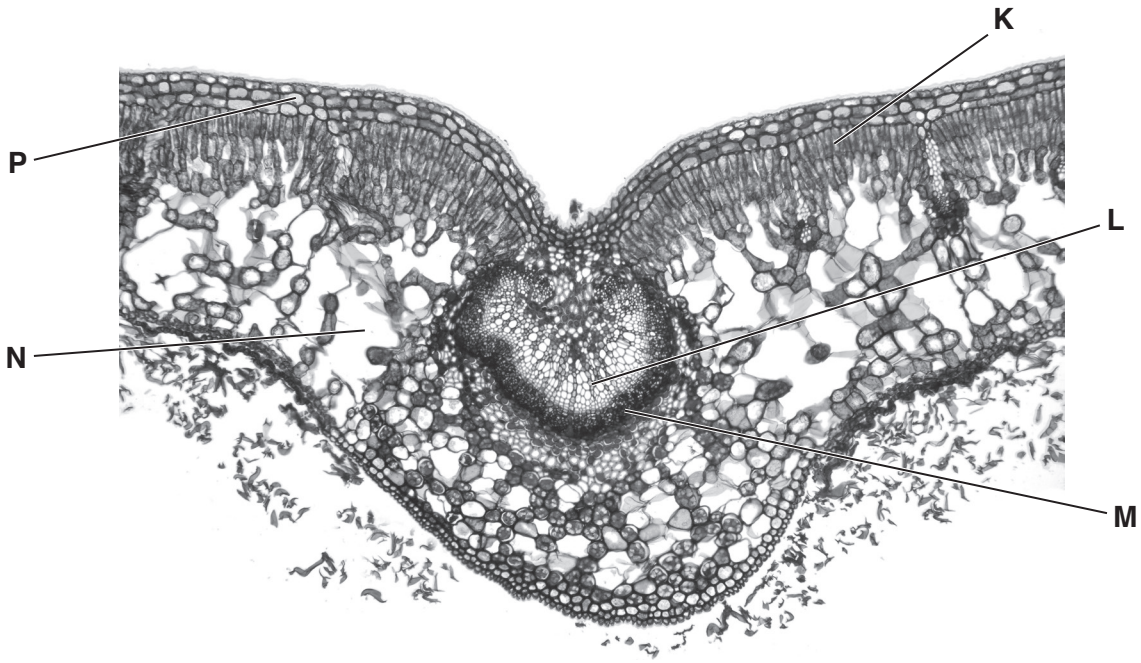


Fig. 2.2

(i) State the letter on Fig. 2.2 which identifies a cell where photosynthesis occurs.

..... [1]

(ii) State the letter on Fig. 2.2 that identifies the part of the plant that transports water from the roots to the leaves **and** state its name.

.....

name ..... [2]

[Total: 12]

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[Turn over

3 Some bacteria are pathogens.

Bacteria were grown in a Petri dish on agar jelly which contained nutrients. The bacteria covered the whole surface of the agar jelly.

Three paper discs were placed on the agar jelly. Each paper disc contained a different antibiotic. The bacteria were left to grow for 24 hours at 35 °C.

Fig. 3.1 shows the growth of the bacteria on the agar jelly at the start and after 24 hours.

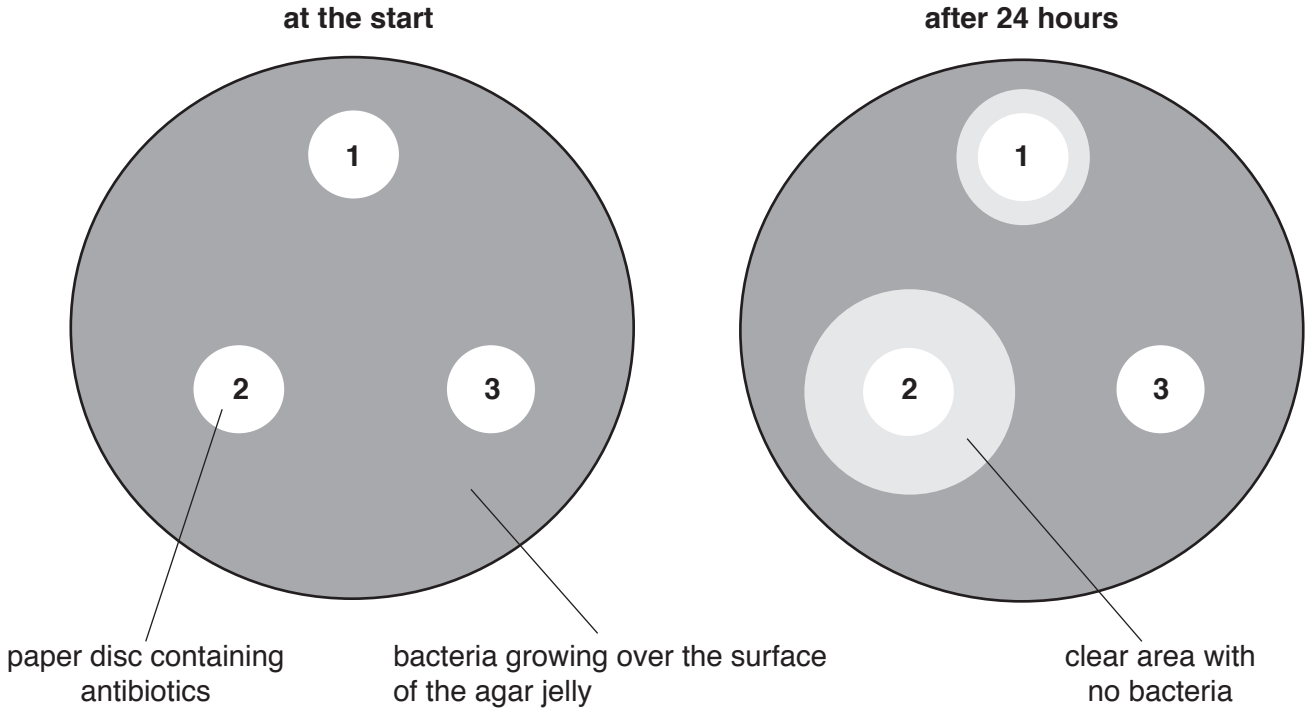


Fig. 3.1

(a) (i) Suggest why there are clear areas around some of the paper discs after 24 hours.

.....

.....

..... [1]

(ii) List the numbers of the antibiotics in order from most effective to least effective.

Give a reason for your choice.

most effective .... least effective

reason .....

.....

.....

[2]

(b) Fig. 3.2 is a drawing of a bacterial cell.

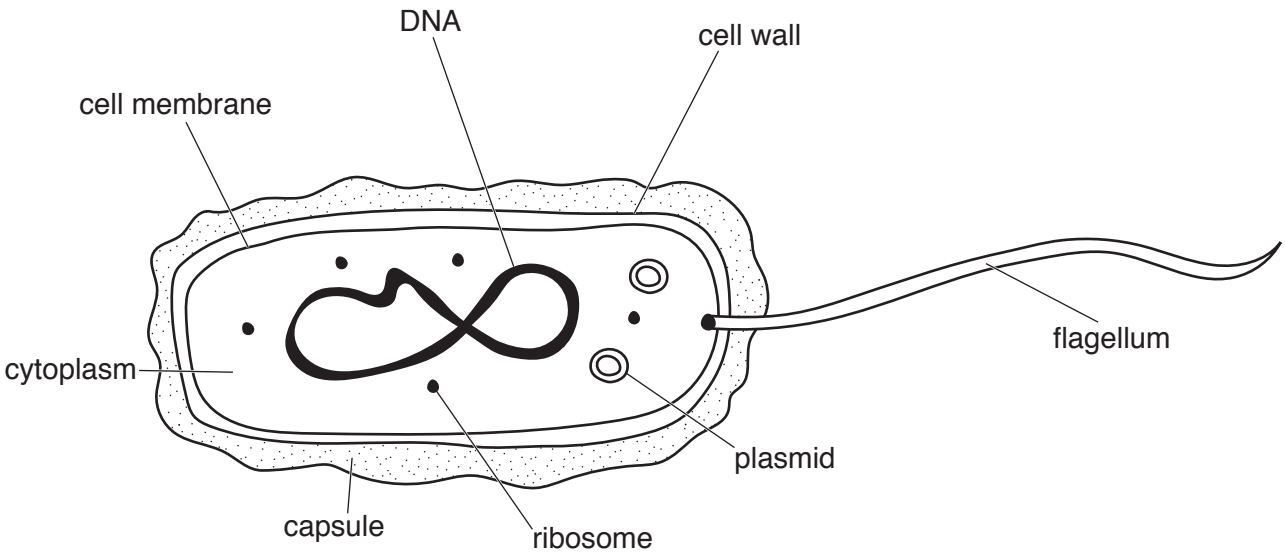


Fig. 3.2

State **three** ways in which a plant cell is similar to the bacterial cell shown in Fig. 3.2.

1 .....

2 .....

3 .....

[3]

(c) Pathogens for transmissible diseases can be transmitted either through direct contact or indirect contact.

Table 3.1 gives examples of ways in which pathogens can be transmitted.

Identify the examples of **direct** contact by placing a tick (✓) in the correct boxes in Table 3.1.

Table 3.1

example	direct contact
air	
blood	
body fluids	
contaminated food	
contaminated surfaces	

[2]

[Total: 8]

4 Fig. 4.1 is a photograph of a zedonk.

A zedonk is the offspring of a male zebra and a female donkey.



Fig. 4.1

(a) (i) State the name of the group within the animal kingdom to which zebras, donkeys and zedonks belong.

..... [1]

(ii) State **one** feature of the group identified in **4(a)(i)** that is visible in Fig. 4.1.

..... [1]

(b) The zedonk was produced by *sexual reproduction*.

Define the term *sexual reproduction*.

.....

.....

..... [3]

(c) Fig. 4.2 shows a plant.

This plant reproduces asexually by producing plantlets on side shoots.

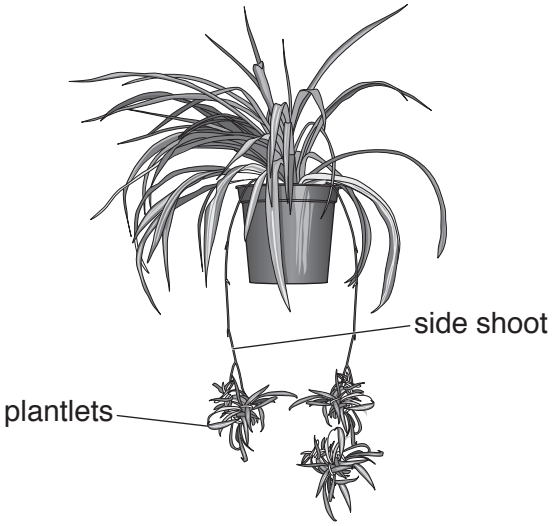


Fig. 4.2

The box on the left contains the term asexual reproduction. The boxes on the right show some sentence endings.

Draw **two** straight lines from the asexual reproduction box to the boxes on the right to make two correct sentences.

	needs male and female gametes.
	needs two parents.
	only needs one parent.
Asexual reproduction	
	produces offspring that are a different species.
	produces offspring that are genetically different to the parents.
	produces offspring that are genetically identical to the parent.

[2]

[Total: 7]

5 **(a)** List **two** features of human gas exchange surfaces.

1 .....

2 .....
[2]

(b) Carbon dioxide is excreted through the lungs.

(i) Describe a chemical test that would identify that the gas excreted through the lungs is carbon dioxide.

chemical test .....

.....

positive test result .....

.....
[2]

(ii) There are differences between the composition of inspired and expired air.

Table 5.1 shows **four** of the gases that make up air and the percentage of each gas that is in inspired and expired air.

Use numbers from the list to complete the table.

Each number can be used once, more than once or not at all.

4.00 **58.00** **21.00** **16.00**

0.04 **78.00** **1.00** **0.96**

Table 5.1

gas	percentage in inspired air	percentage in expired air
carbon dioxide	0.04	
oxygen		16.00
Z	variable	increased
nitrogen	78.00	78.00

[2]

(iii) State the name of gas **Z** shown in Table 5.1.

..... [1]

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(c) An athlete measured his breathing rate during 12 minutes of exercise.

The results are shown in Fig. 5.1.

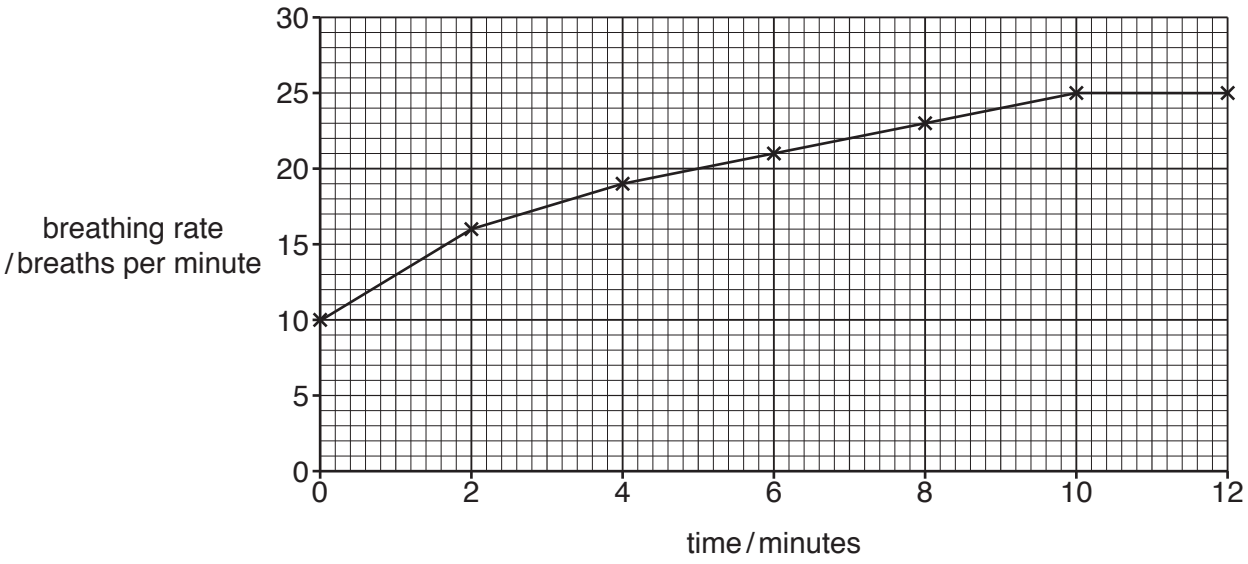


Fig. 5.1

(i) Describe the changes in the breathing rate, while the athlete was exercising, shown in Fig. 5.1.

.....

.....

.....

.....

..... [3]

(ii) Calculate the percentage change in the breathing rate between 0 and 10 minutes.

Give your answer to the nearest whole number.

Show your working.

..... %
[2]

(iii) The activity of the heart can also be used to monitor the effects of physical activity.

State **two** methods that can be used to monitor the activity of the heart.

1 .....

2 .....
[2]

[Total: 14]

6 **(a)** Fig. 6.1 shows a fetus during the final stage of pregnancy.

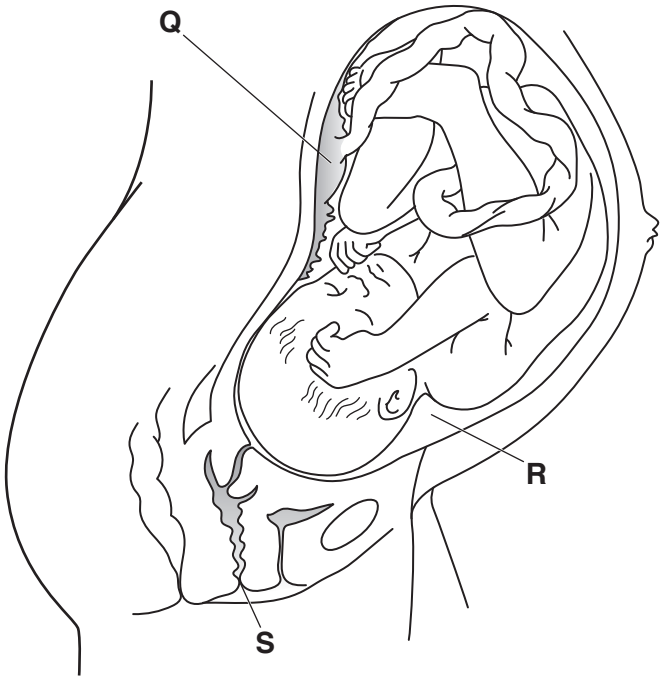


Fig. 6.1

(i) The boxes on the left show a letter from Fig. 6.1.

The boxes in the middle show the name of a part shown in Fig. 6.1.

The boxes on the right show the function of each part.

Draw **one** line to link each letter from Fig. 6.1 to its correct name.

Draw **one** line to link each name to its correct function.

Draw a total of **six** lines.

letter on Fig. 6.1	name	function
Q	amniotic fluid	exchange of nutrients or gases
R	placenta	protects the fetus from damage
S	vagina	receives sperm during sexual intercourse

[4]

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(ii) Table 6.1 shows some of the events (**A** to **F**) that occur during birth.

Table 6.1

A	passage through the vagina
B	breaking of the amniotic sac
C	delivery of the afterbirth
D	dilation of the cervix
E	contraction of the muscle in the uterus wall
F	tying and cutting the umbilical cord

Put the events into the correct sequence by ordering the letters.

One has been done for you.

		B			

[3]

(b) The diet of a woman is very important during pregnancy.

(i) State the name of **one** component of a pregnant woman's diet that is needed for the formation of bones in the fetus.

..... [1]

(ii) State the importance of iron in a pregnant woman's diet.

.....

..... [1]

(iii) State **one** source of iron in the diet.

..... [1]

(iv) State why women are often advised to avoid alcohol consumption during pregnancy.

.....

.....

..... [1]

[Total: 11]

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[Turn over

7 A student investigated the rate of oxygen uptake during aerobic respiration in woodlice. Woodlice are arthropods.

(a) State the word equation for aerobic respiration.

..... [2]

(b) Fig. 7.1 shows the apparatus the student used. Soda lime absorbs carbon dioxide.

When the tap is closed air cannot move into or out of the apparatus. The coloured liquid moves when the tap is closed.

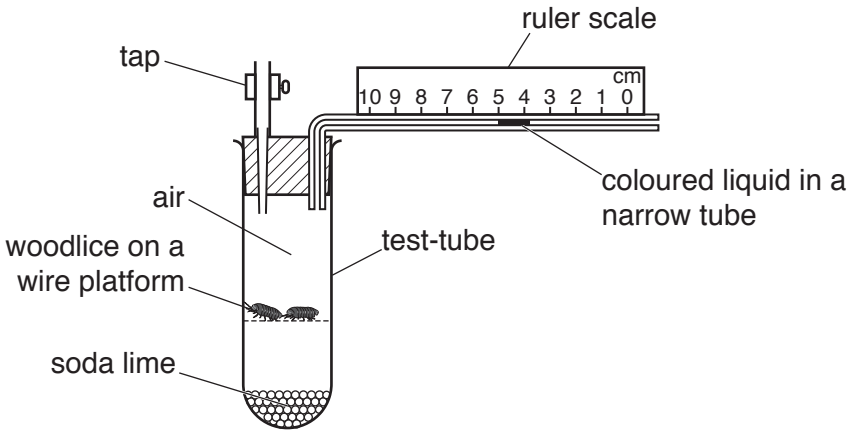


Fig. 7.1

Table 7.1 shows the results of this investigation.

Table 7.1

time / minutes	position of the coloured liquid on the ruler scale / cm
0	1.0
2	2.1
4	3.1
6	4.2
8	5.5
10	5.9
12	7.5

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(i) Explain why the coloured liquid moves towards the woodlice during the investigation.

.....

.....

.....

.....

.....

.....

..... [3]

(ii) Suggest why it is important that the temperature of the apparatus did not exceed 40 °C.

.....

.....

.....

.....

..... [2]

(iii) Respiration releases energy.

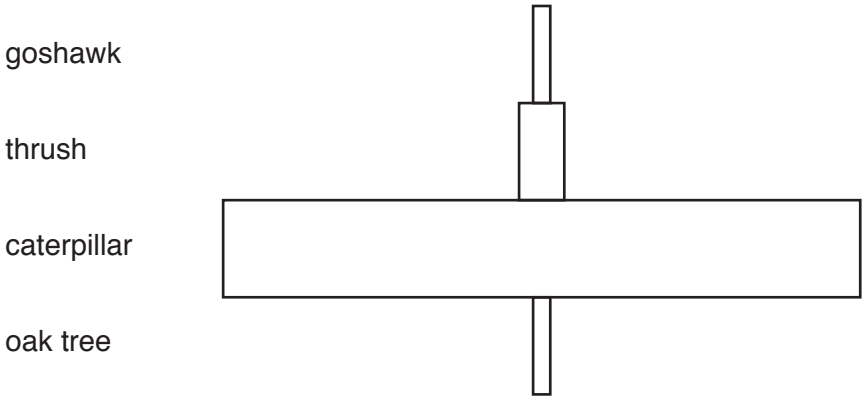
State **two** uses of energy in the body of a human.

1 .....

2 .....
[2]

[Total: 9]

8 **(a)** Fig. 8.1 shows the pyramid of numbers for a food chain in a forest.



not to scale

Fig. 8.1

(i) State the name of the organism in Fig. 8.1 that has the largest number of individuals in the pyramid of numbers.

..... [1]

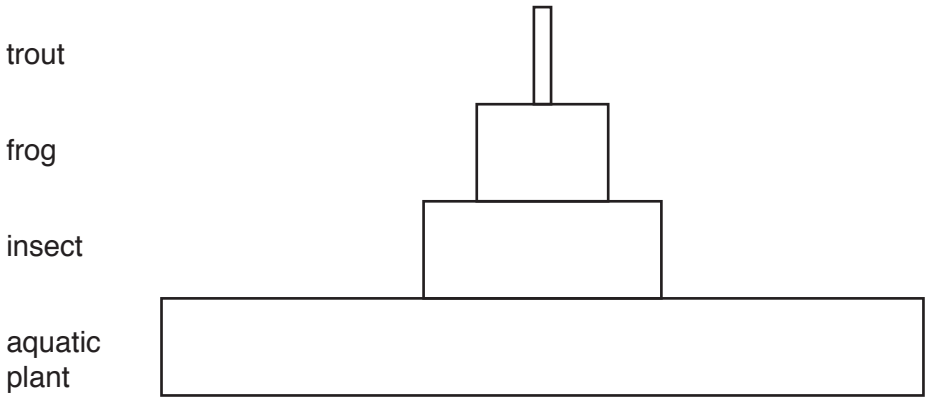
(ii) State the name of the secondary consumer in Fig. 8.1.

..... [1]

(iii) State the principal source of energy input in a food chain.

..... [1]

(b) Fig. 8.2 shows the pyramid of numbers for a food chain in a lake.



not to scale

Fig. 8.2

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(i) The pyramids of numbers in Fig. 8.1 and Fig. 8.2 are different shapes. Explain why they are different.

.....

.....

..... [1]

(ii) Most of the trout from the lake in Fig. 8.2 were caught by fishermen.

State **and** explain what effect this might have on the populations of frogs and insects.

frogs .....

.....

.....

insects .....

.....

.....

[4]

(c) Bacteria and fungi obtain energy from dead organic material.

Put a tick (✓) in the box that describes bacteria and fungi.

carnivores	
decomposers	
herbivores	
producers	

[1]

[Total: 9]

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