**Cambridge International Examinations**
Cambridge International General Certificate of Secondary Education

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**BIOLOGY** **0610/22**

Paper 2 Core **October/November 2014**

**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.

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

This document consists of **17** printed pages and **3** blank pages.


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**1** Fig. 1.1 shows five invertebrates that can harm humans.

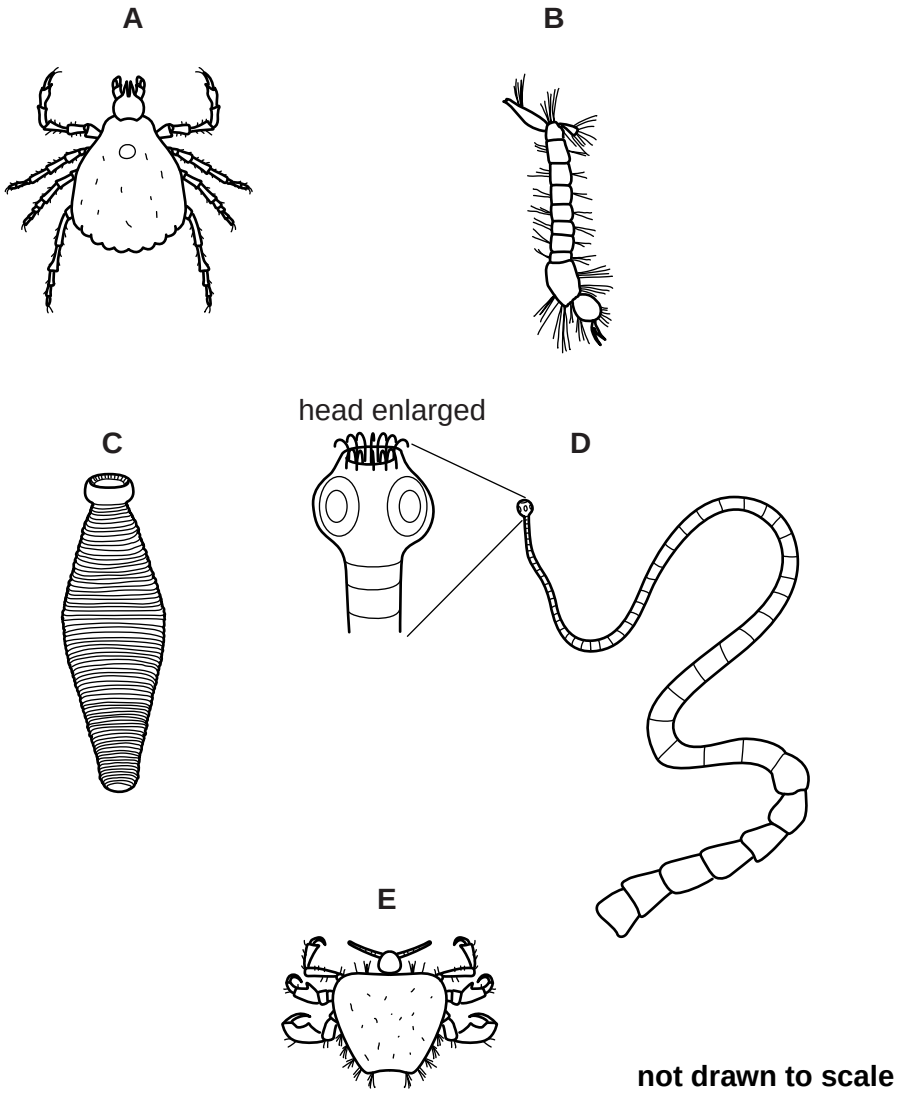



**Fig. 1.1**

Use the key to identify the invertebrates shown in Fig. 1.1.

Write the letter for each organism in the key.

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**Key**

| description | | name of organism | letter |
|---|---|---|---|
| 1 | (a) body divided into visible segments | go to 3 | |
| | (b) body not divided into visible segments | go to 2 | |
| 2 | (a) four pairs of legs present | *Amblyomma americanum* | |
| | (b) three pairs of legs present | *Pthirus pubis* | |
| 3 | (a) bristles present on body | *Aedes aegypti* | |
| | (b) no bristles present on body | go to 4 | |
| 4 | (a) hooks on head | *Taenia solium* | |
| | (b) no hooks on head | *Hirudo medicinalis* | |

[4]

**[Total: 4]**

**2** **(a)** Fig. 2.1 shows the relationship between body height and body mass in humans.
People can be placed into categories according to this relationship, as shown in Fig. 2.1.

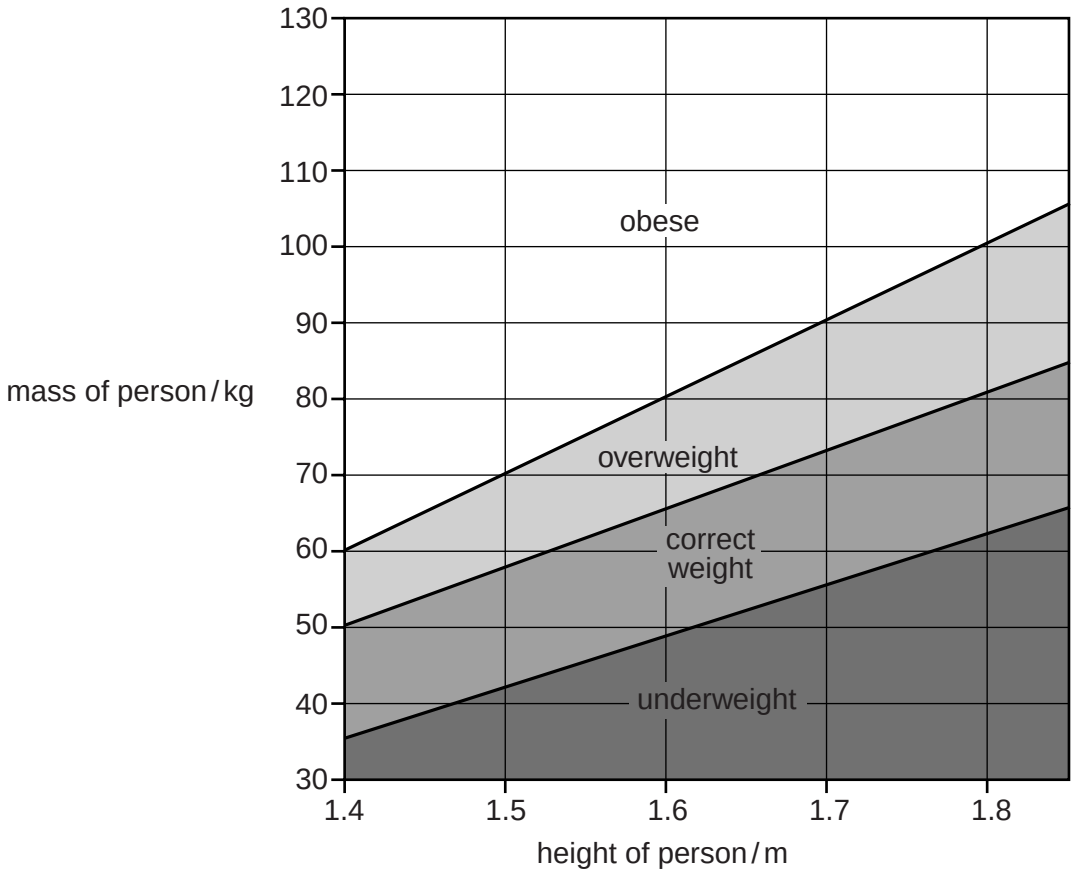



**Fig. 2.1**

**(i)** Table 2.1 gives the height and mass of four students.
Use the information in Fig. 2.1 to complete the last column in Table 2.1.

**Table 2.1**

| student | height / m | mass / kg | category |
|---|---|---|---|
| **G** | 1.5 | 73 | |
| **H** | 1.7 | 65 | |
| **J** | 1.8 | 55 | |
| **K** | 1.8 | 85 | |

[2]

**(ii)** Suggest **two** ways in which Fig. 2.1 could be improved to make it apply to everyone.

1 .....

.....

2 .....

.....[2]

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**(b)** An obese student wishes to lose weight.

**(i)** Name **two** classes of food that need to be reduced in the diet of an obese person to help lose weight.

1 .....

2 .....[2]

**(ii)** People who are trying to lose weight are also advised to take more exercise. Explain how this would help them lose weight.

.....

.....

.....

.....

.....

.....[3]

**(iii)** People who are obese are more likely to develop certain diseases than people who are the correct weight.

Name a disease that is linked to obesity.

.....[1]

**(c)** A balanced diet includes food that provides fibre (roughage).

Name a food that is a good source of fibre and explain why it is important to include fibre in the diet.

source .....

importance .....

.....

.....

.....

.....

.....[4]

**[Total: 14]**

**3** **(a)** Fig. 3.1 shows the female reproductive system.

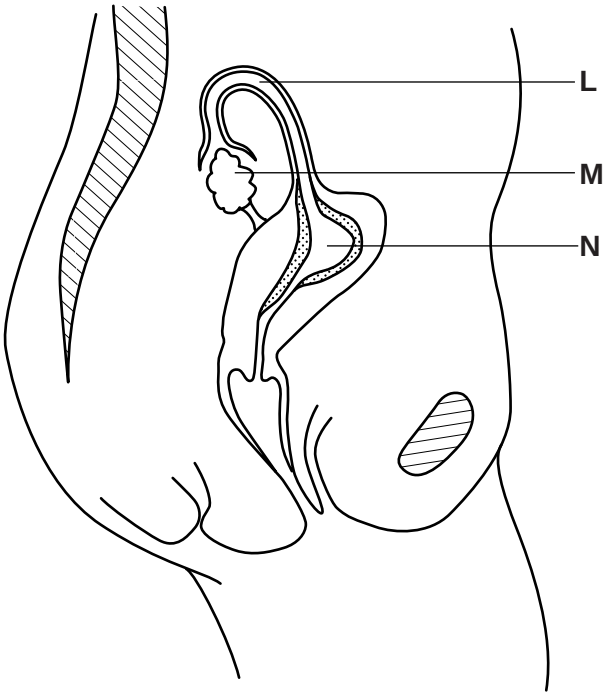



**Fig. 3.1**

State the names of the structures labelled **L**, **M** and **N** and give a function for each structure. Write your answers in Table 3.1.

**Table 3.1**

| letter | name of structure | function of structure |
|---|---|---|
| **L** | | |
| **M** | | |
| **N** | | |

[6]

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**(b)** Inheritance of sex in humans is controlled by two chromosomes which are given the symbols X and Y.

Fig. 3.2 is a flow diagram showing how two parents can produce a **female** baby.

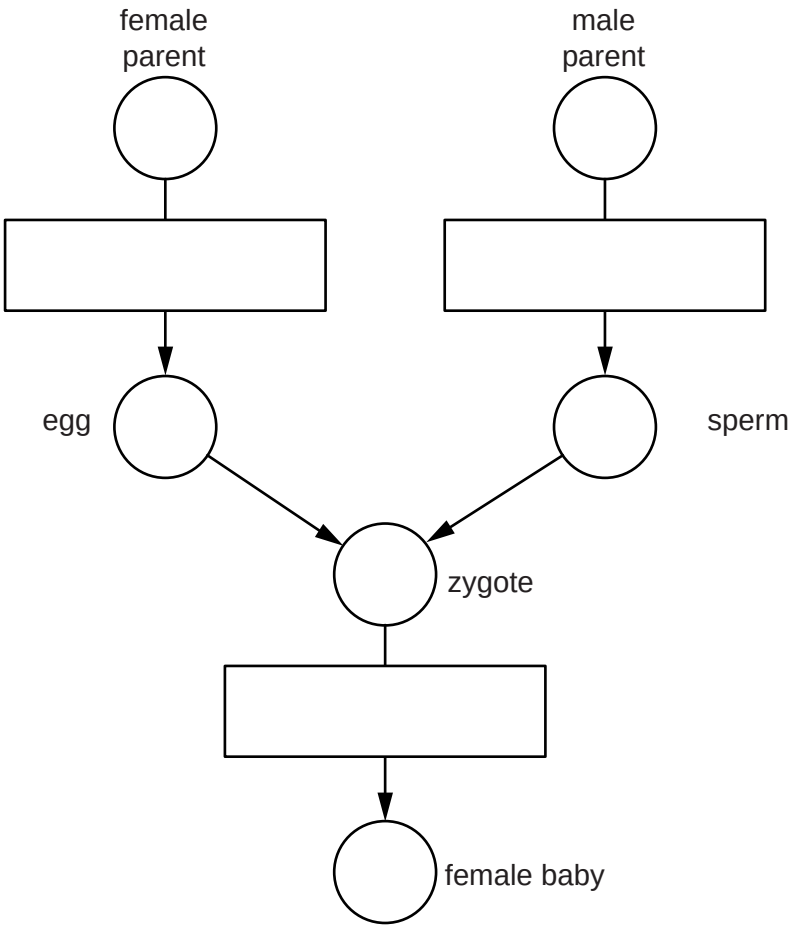



**Fig. 3.2**

Complete Fig. 3.2 by:

- writing in each **circle** on Fig. 3.2, the symbols for the sex chromosomes that are present
- writing in each **box** on Fig. 3.2, the name of the type of cell division that occurs.

[6]

**[Total: 12]**

**4** **(a)** Fig. 4.1 shows a section through an insect-pollinated flower.
The structures in the flower are labelled by letters.

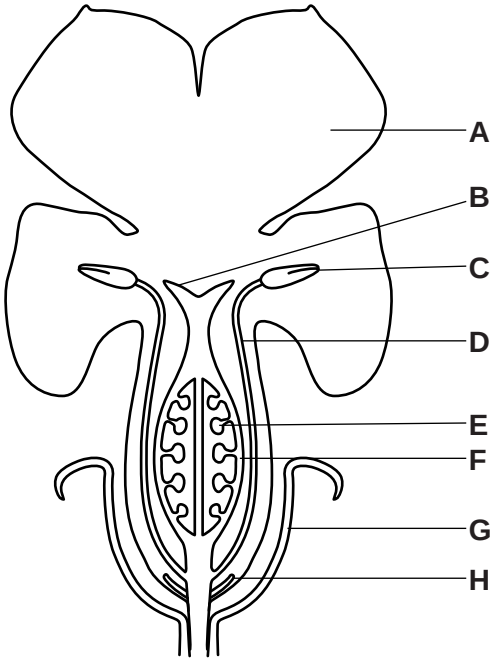



**Fig. 4.1**

Table 4.1 describes the functions of **four** of the flower parts.

Complete Table 4.1 by writing the letter that identifies the flower part that carries out each function.

**Table 4.1**

| function of flower part | letter |
|---|---|
| forms the seed | |
| produces pollen | |
| protects the flower bud | |
| receives the pollen | |

[4]

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**(b)** Insect-pollinated flowers and wind-pollinated flowers are different in structure.

Complete Table 4.2 by:

- stating how the stamens and pollen of wind-pollinated flowers are different from those of insect-pollinated flowers
- giving a reason for each of the differences.

An example for the petal has been completed for you.

**Table 4.2**

| flower part | difference | reason for the difference |
|---|---|---|
| petal | wind-pollinated flowers have small petals that are not brightly coloured | wind-pollinated flowers do not need to attract insects |
| stamen | | |
| pollen | | |

[4]

**[Total: 8]**

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**5** Fig. 5.1 shows the water cycle.
Letters have been used to represent **different** processes that take place in the cycle.

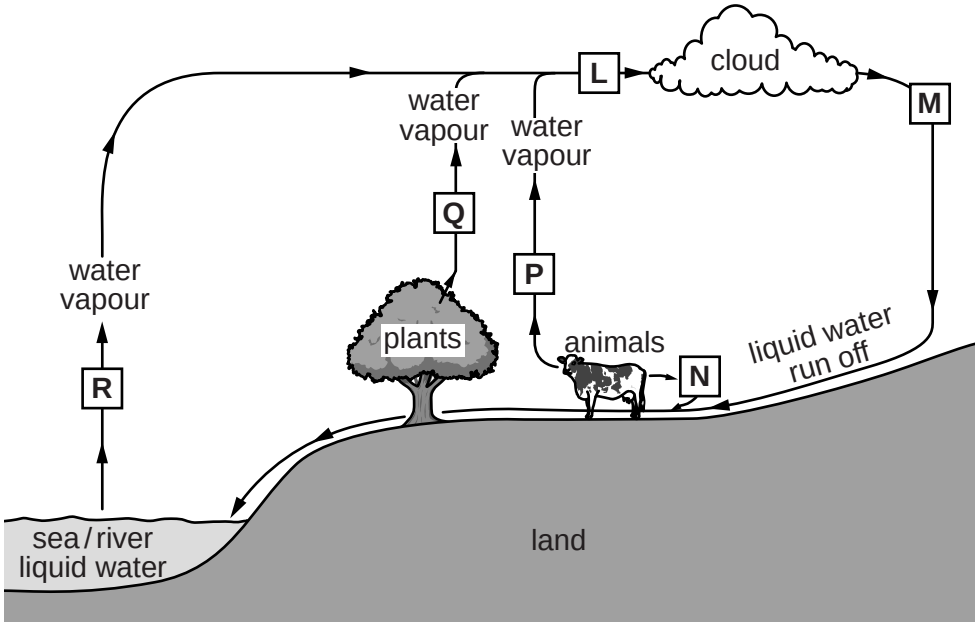



**Fig. 5.1**

Identify the **different** processes represented by letters **L**, **M**, **N**, **P**, **Q** and **R** and name them in Table 5.1.

**Table 5.1**

| letter representing the process | name of process in the water cycle |
|---|---|
| **L** | |
| **M** | |
| **N** | |
| **P** | |
| **Q** | |
| **R** | |

[6]

**[Total: 6]**

**6** **(a)** The list states some of the roles of organisms in a food chain.

**carnivore** **decomposer** **herbivore** **primary consumer**

**producer** **secondary consumer** **tertiary consumer**

In each box on Fig. 6.1, use **two** terms from the list to describe the roles of the organisms in food chain **A** and food chain **B**.
Each term may be used once, more than once, or not at all.

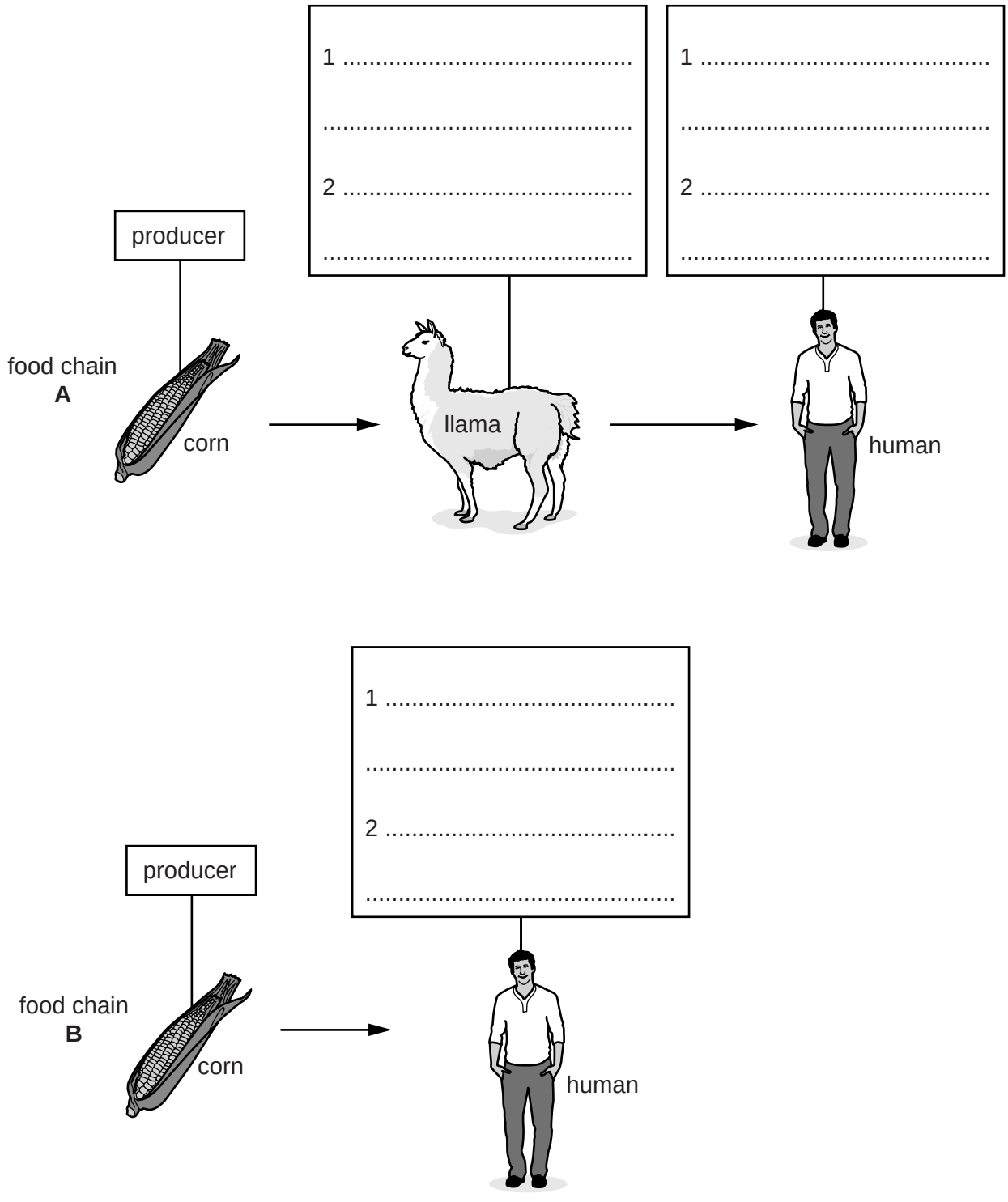



**Fig. 6.1**

[6]

**(b)** Define the term *trophic level*.

.....

.....

.....

.....[2]

**(c)** A student described a food chain found in his garden.

- One bush has hundreds of aphids on it.
  The aphids suck liquid from the phloem of the bush to get their food.
- The aphids are eaten by large beetles.
- All the beetles have many parasites on their bodies.
  The parasites suck liquids from the bodies of the beetles for their food.

Fig. 6.2 shows part of the pyramid of numbers for this food chain.

Complete Fig. 6.2 by:

- sketching in the **two** missing boxes
- labelling the **four** boxes with the names of the organisms.

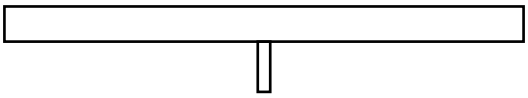


**Fig. 6.2**

[2]

**[Total: 10]**

**7** Humans carry out aerobic and anaerobic respiration.

**(a)** Compare the two types of respiration by completing Table 7.1.

Place a tick (✓) to show which statements are correct for each type of respiration in humans.

**Table 7.1**

| statement | aerobic respiration | anaerobic respiration |
|---|---|---|
| produces lactic acid | | |
| releases carbon dioxide | | |
| uses glucose | | |
| uses oxygen | | |

[4]

**(b)** Athletes compete in races of different distances.

Fig. 7.1 shows the percentage of energy released by aerobic and anaerobic respiration during these races.

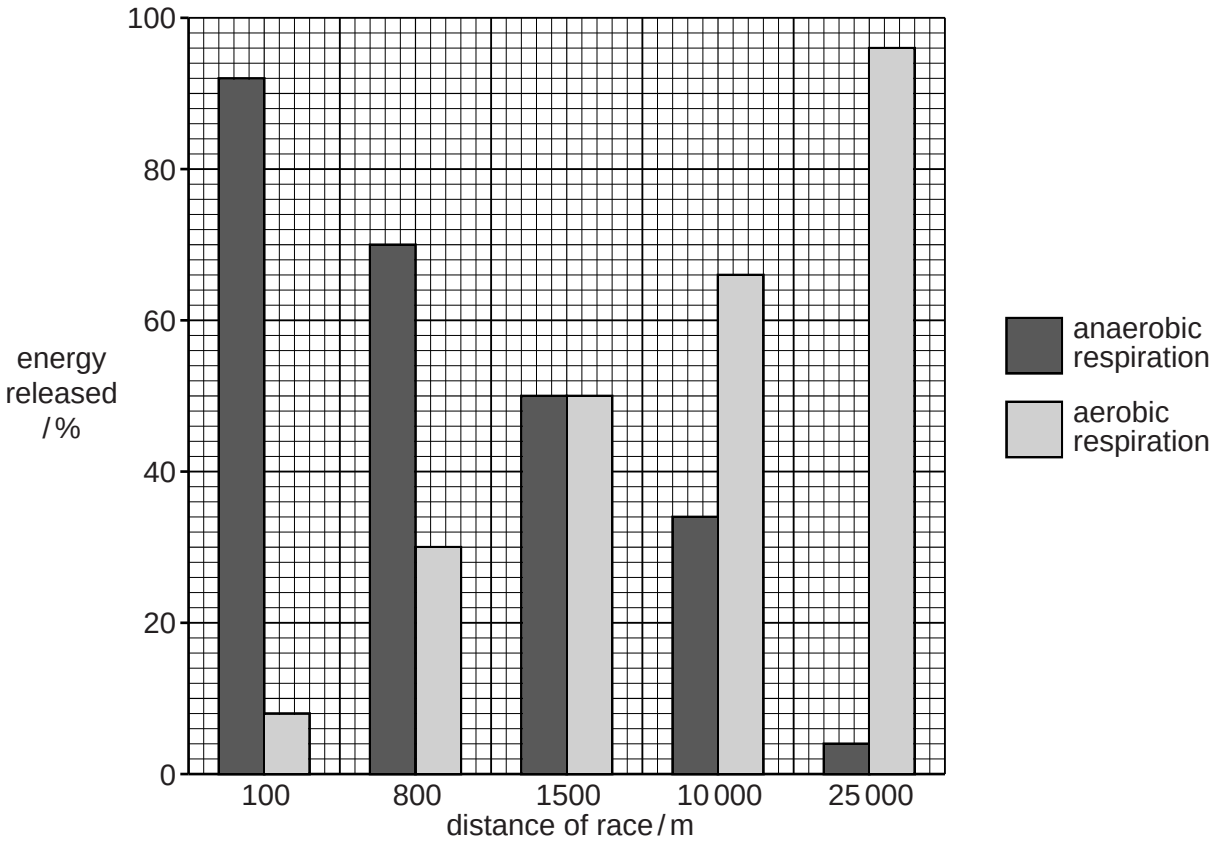



**Fig. 7.1**

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Use Fig. 7.1 to:

**(i)** state the percentage of energy that is provided by anaerobic respiration in a 100m race

..... % [1]

**(ii)** state the length of race in which 96% of the energy is provided by aerobic respiration

.....m [1]

**(iii)** state the length of race where the total energy released by each type of respiration is equal.

.....m [1]

**(c)** State **two** conclusions that can be made from the data shown in Fig. 7.1.

1 .....

.....

2 .....

.....[2]

**[Total: 9]**

**8** Fig. 8.1 shows a section through a leaf. The leaf is adapted to carry out photosynthesis in the plant.

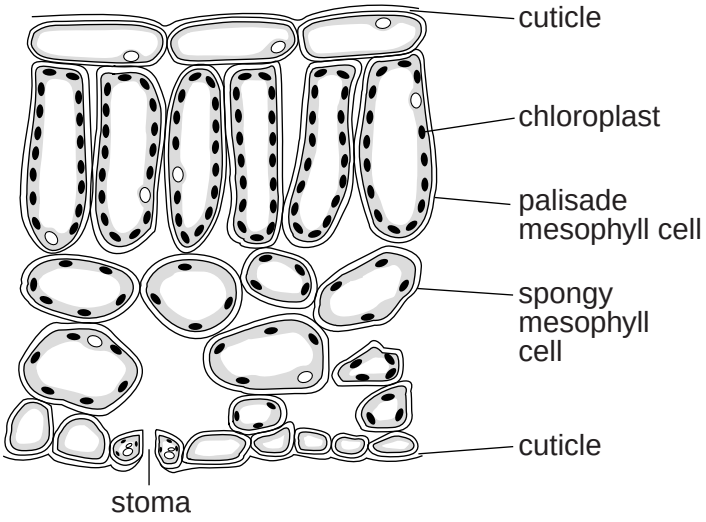



**Fig. 8.1**

**(a) (i)** Give the word equation for photosynthesis.

.....

.....[2]

**(ii)** State the function of the chloroplasts in photosynthesis.

.....

.....[2]

**(iii)** Describe how the chloroplasts are distributed in the mesophyll layers of the leaf and explain how this distribution is important for efficient photosynthesis.

description .....

.....

explanation .....

.....[2]

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**(b) (i)** Explain the role of stomata in the process of photosynthesis.

.....

.....

.....

.....[2]

**(ii)** Explain the function of the cuticle in a leaf.

.....

.....

.....

.....[2]

**(c)** To grow, a plant needs a supply of nitrate ions.

Explain the reason for this.

.....

.....

.....

.....[2]

**[Total: 12]**

**9** Fig. 9.1 shows processes that are carried out by organs in the human body.

Draw **one** line from each process to the organ where the process takes place.

You will need to draw **five** lines.

| **process** | **organ** |
| --- | --- |
| breaks down alcohol | |
| | kidney |
| destroys hormones | |
| | liver |
| eliminates excess water | |
| | lung |
| excretes carbon dioxide | |
| forms urea | |

[5]

**Fig. 9.1**

**[Total: 5]**

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