Cambridge IGCSE

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

| | |
|---|---|
| CANDIDATE NAME | |
| CENTRE NUMBER | |
| CANDIDATE NUMBER | |



**BIOLOGY** **0610/31**

Paper 3 Theory (Core) **May/June 2018**

**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 approved 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.

DC (SR/JG) 146413/5


CAMBRIDGE International Examinations

**[Turn over**

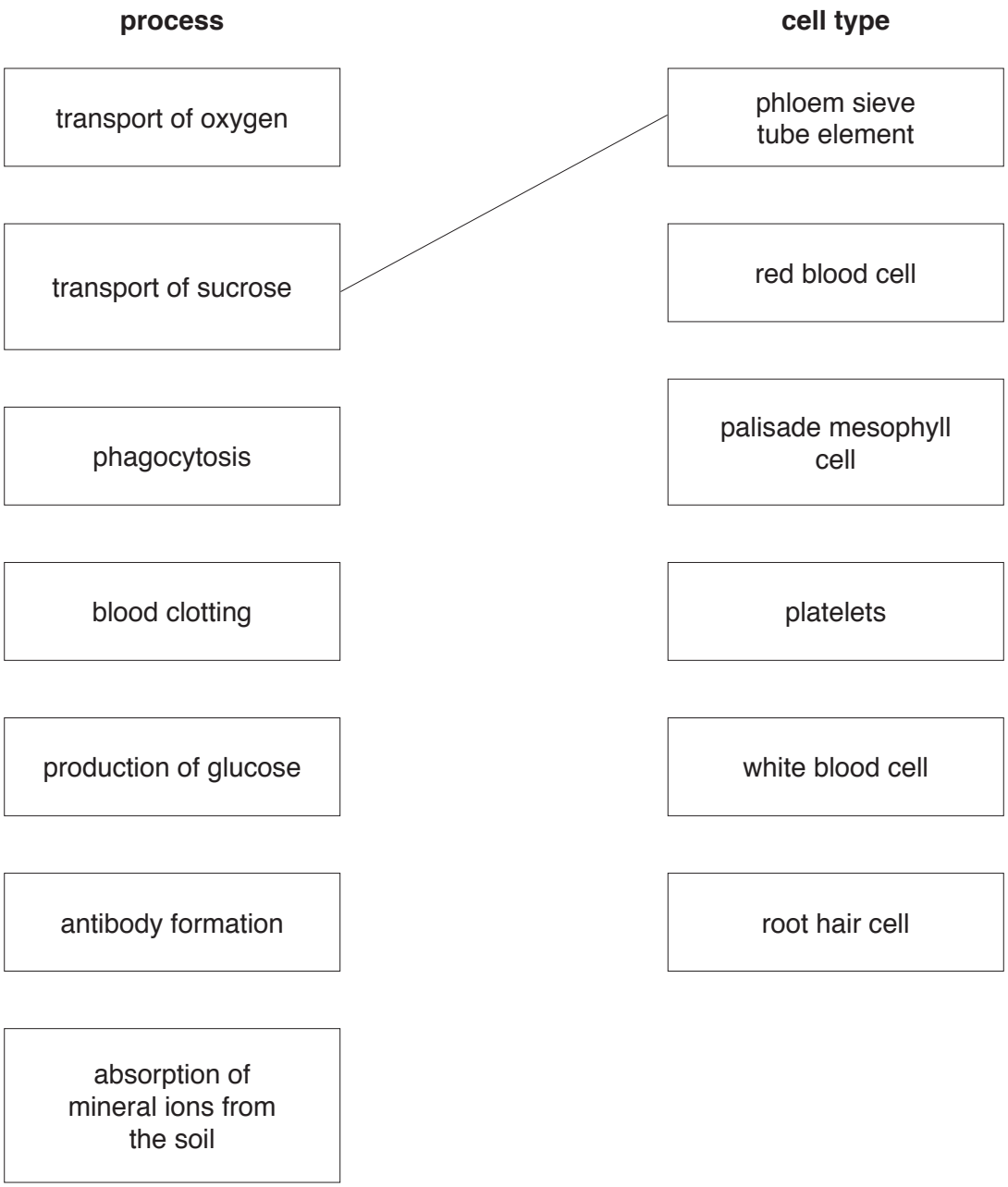
**1** **(a)** The boxes on the left describe processes carried out by cells.

The boxes on the right contain the names of the cells that carry out these processes.

Draw **one** straight line from each box on the left to a box on the right to link the process to the cell type.

Draw **six** lines.

An example has been done for you.




[6]

**(b)** Fig. 1.1 shows a section through part of a leaf.

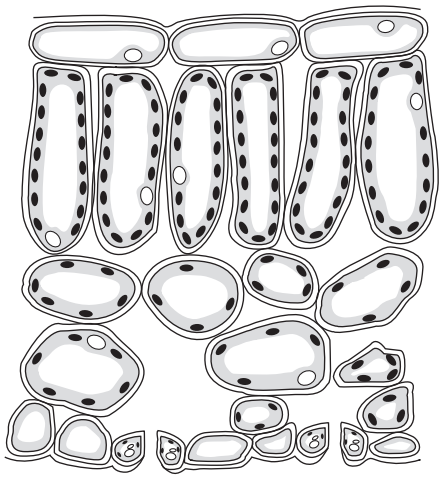


**Fig. 1.1**

**(i)** On Fig. 1.1 draw:

- a label line to identify one guard cell and label it **G**
- a label line to identify one of the stomata and label it **S**.

[2]

**(ii)** State **one** function of stomata.

.....

..... [1]

[Total: 9]





**[Turn over**

**2** **(a)** Define the term *sexual reproduction*.

.....

.....

.....[3]

**(b)** Fig. 2.1 shows some organs in the body of a man.

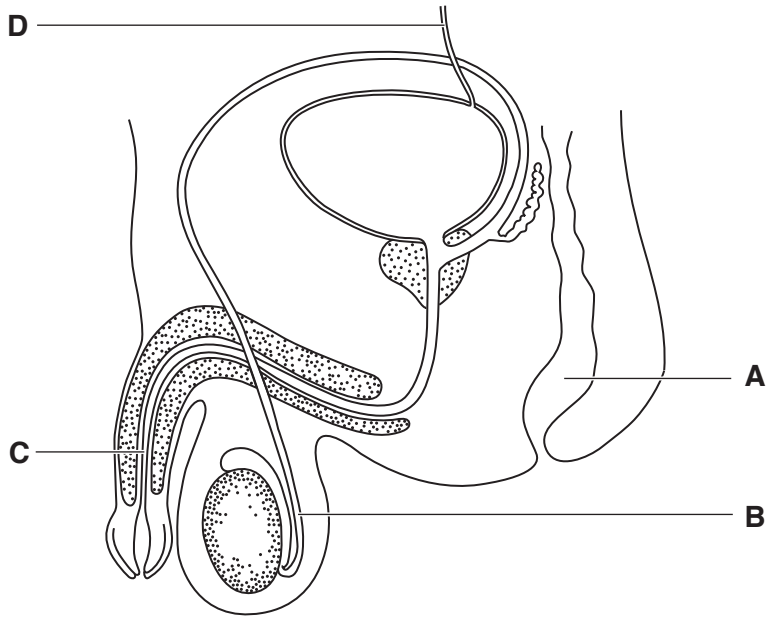



**Fig. 2.1**

**(i)** Complete Table 2.1 by writing in the names of the parts labelled **A** to **D** in Fig. 2.1.

**Table 2.1**

| letter on Fig. 2.1 | name of part | name of the substance or substances transported |
|---|---|---|
| **A** | | faeces |
| **B** | | sperm |
| **C** | | sperm and urine |
| **D** | | urine |

[4]

**(ii)** On Fig. 2.1 draw a label line to the prostate gland and label it **P**. [1]

**(c)** State the function of the scrotum.

.....

.....

.....[1]

[Total: 9]

**3** This question is about neurones and reflex actions.

Choose words from the list to complete the sentences.

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

**endocrine** **fast** **impulses**

**motor** **nervous** **receptor** **sensory**

**slow** **stimuli** **synapses**

Neurones are cells that are part of the ..... system.

There are three types of neurone involved in a simple reflex action: a sensory neurone, a relay neurone and a ..... neurone.

The nerves conduct electrical ..... . These are transmitted from one neurone to the next at junctions called ..... .

A reflex action is automatic, co-ordinated and ..... .

[5]

[Total: 5]

**BLANK PAGE**



[Turn over

**4** **(a)** Respiration releases energy.

Write the word equation for aerobic respiration.

..... [2]

**(b)** Fig. 4.1 shows the average daily energy requirement of different groups of males and females.

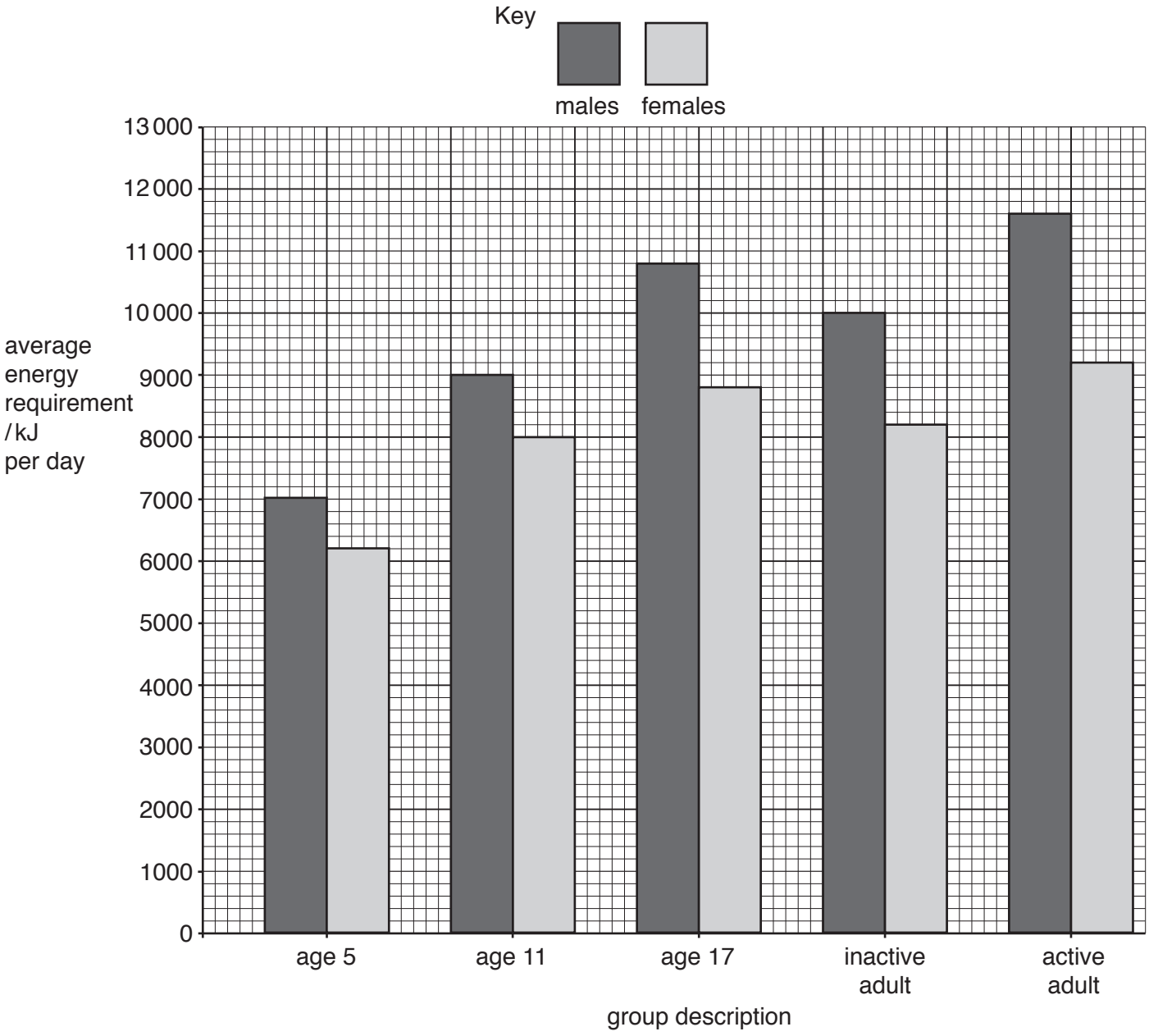



**Fig. 4.1**

**(i)** State the average energy requirement of a five-year-old female.

..... kJ per day
[1]

**(ii)** An eleven-year-old male received only 8000 kJ per day for four months.

Use the data in Fig. 4.1 to suggest **two** ways this could affect him.

1 .....

2 .....

[2]

**(c)** Use the data in Fig. 4.1 to make **three** comparisons between the energy requirements of individuals aged 17 years and adults.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

**(d)** Yeast cells can respire anaerobically.

Biotechnology makes use of this.

State **two** ways that the products of anaerobic respiration in yeast are used by humans.

1 .....

.....

2 .....

.....

[2]

[Total: 10]





**[Turn over**

**5 (a) (i)** The sentences in the box describe the feeding relationships between four organisms.

| |
|---|
| Hawks obtain their energy from blackbirds. |
| A fig tree carries out photosynthesis. |
| Blackbirds are secondary consumers. |
| Caterpillars are herbivores. |

Use the information in the sentences to write a food chain containing these four organisms.

Do **not** draw pictures of the organisms.

[3]

**(ii)** State the principal source of energy for this food chain.

..... [1]

**(iii)** State the type of organism that gains its energy from dead organic material.

..... [1]

**(b) (i)** A species becomes endangered when it is at risk of extinction.

Explain **two** ways in which a species could become endangered.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

**(ii)** State **one** way in which endangered species can be conserved.

.....

.....

.....[1]

[Total: 10]

**6** Fig. 6.1 shows a section through a tooth.

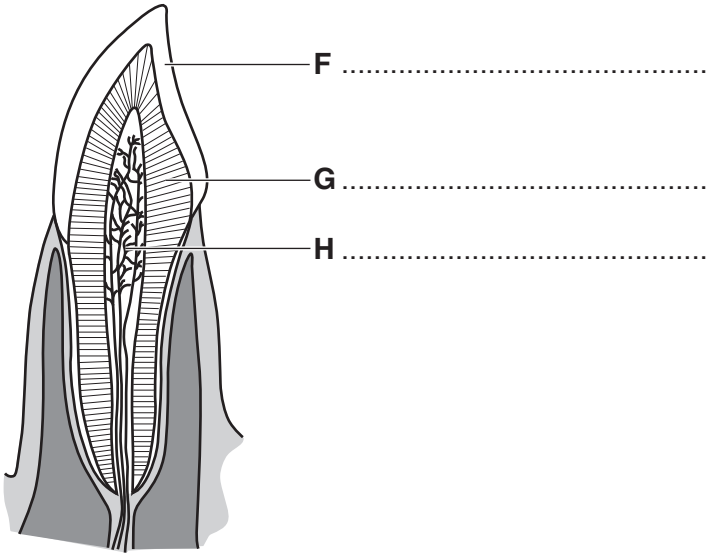



**Fig. 6.1**

**(a)** State the names of structures **F**, **G** and **H**.

Write your answers on Fig. 6.1.

[3]

**(b)** **(i)** State **two** functions of teeth.

1 .....

.....

2 .....

.....

[2]

**(ii)** Describe the importance of teeth in the digestion of food.

.....

.....

.....

..... [2]

[Total: 7]

**7** Fig. 7.1 shows sections of two flowers, **K** and **L**, from the same species.

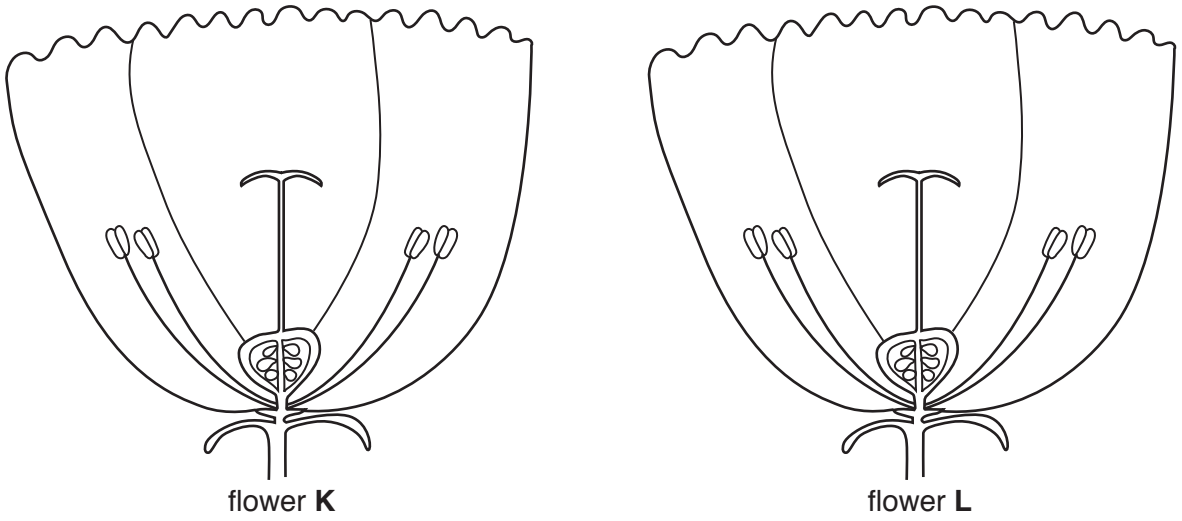



**Fig. 7.1**

**(a)** **(i)** On flower **L** in Fig. 7.1, identify and label an ovule and a petal.

[2]

**(ii)** State the names of the parts in Fig. 7.1 that:

produce ovules .....

protect the bud of the flower .....

[2]

**(b)** On Fig. 7.1, draw an arrow to represent the transfer of pollen from flower **K** to flower **L** during pollination.

[2]

**(c)** A student said, *"Flowers **K** and **L** are pollinated by insects."*

Describe **two** structures in flowers **K** and **L** that support this statement.

Use features that are visible in Fig. 7.1.

1 .....

.....

2 .....

.....

[2]

**(d)** Describe the pathway water takes in a plant, as it moves from the soil to a leaf.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

[Total: 12]

**8** During digestion enzymes act on different types of food to produce simpler substances that can be absorbed.

Complete Table 8.1 by inserting the missing information.

**Table 8.1**

| food type | enzyme acting on the food type | simpler substances produced |
|---|---|---|
| protein | protease | |
| | amylase | |
| | | fatty acids and glycerol |

[5]

[Total: 5]

**9** In an investigation, the carbon dioxide concentration in the air above a crop of maize plants was measured for 24 hours.

There was no wind blowing during the 24 hours of the investigation.

The results of this investigation are shown in Fig. 9.1.

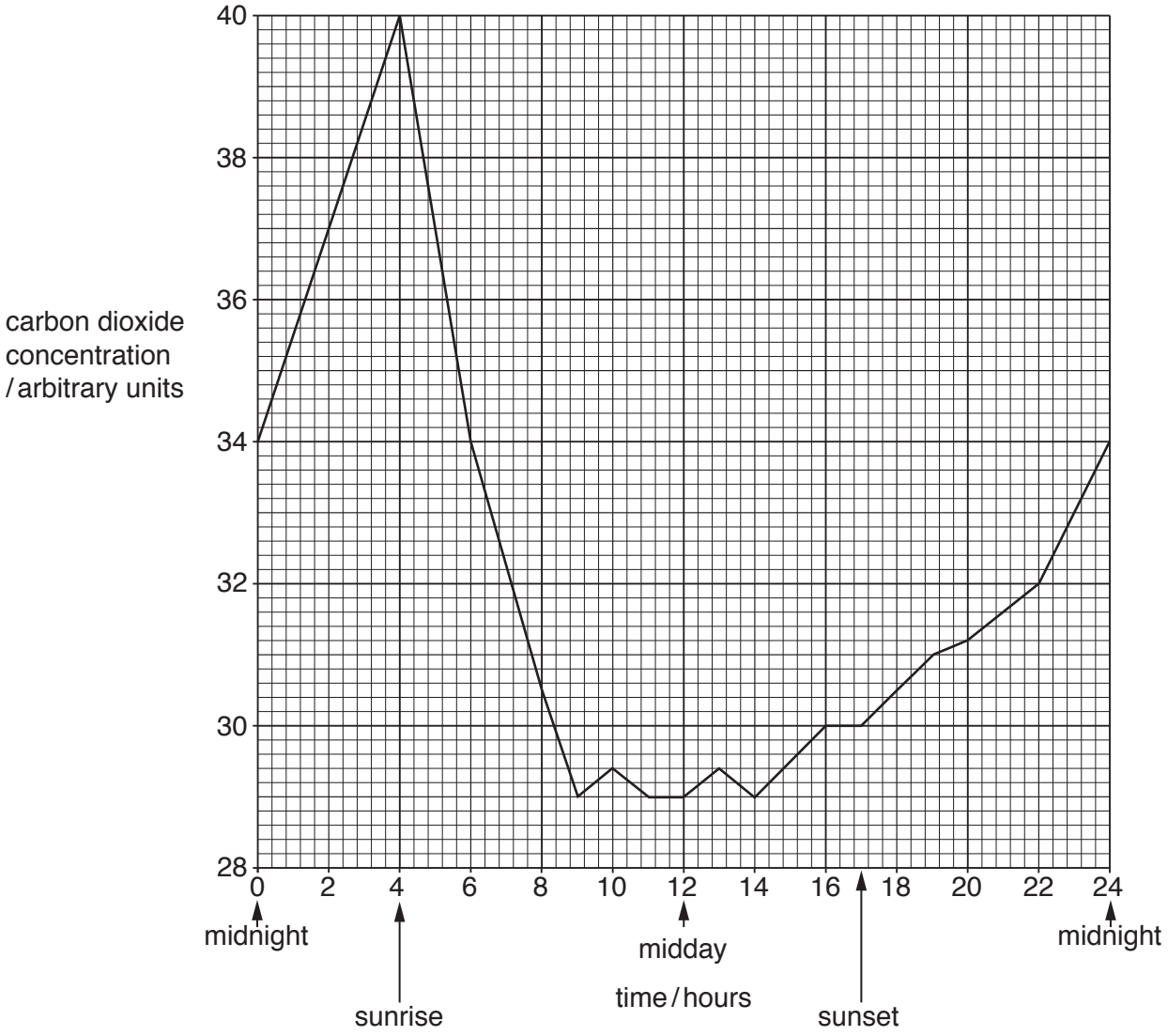



**Fig. 9.1**

**(a) (i)** State the **two** times, on Fig. 9.1, at which the carbon dioxide concentration in the air was 37 arbitrary units.

..... [1]

**(ii)** Calculate the difference in the carbon dioxide concentration in the air between 04:00 (sunrise) and 12:00 (midday) on Fig. 9.1.

Space for working.

.....arbitrary units [1]

**(iii)** Explain why the concentration of carbon dioxide decreases between 04:00 and 09:00.

.....

.....

.....

.....

.....

.....

.....

..... [3]

**(b)** State **two** environmental factors that would affect the results of this investigation.

1 .....

2 .....
[2]

[Total: 7]



**[Turn over**

**10** Selective breeding of animals is very important to farmers.

Many different breeds of sheep have been produced by selective breeding.

Fig. 10.1 shows a flock of Merino sheep. This breed of sheep was produced by selective breeding.

**Fig. 10.1**

**(a)** Sheep are important animals in many parts of the world as they produce meat, wool and milk.

Table 10.1 describes some characteristics of five different breeds of sheep.

**Table 10.1**

| breed of sheep | wool yield | wool quality | meat yield | milk yield |
|---|---|---|---|---|
| Arapawa | average | good | poor | average |
| Awassi | average | poor | average | very good |
| Blackbelly | poor | poor | very good | average |
| Merino | good | very good | good | poor |
| Tsurcana | average | good | average | average |

A farmer wants to sell both meat and wool.

Suggest which breed of sheep in Table 10.1 is the most suitable for this farmer.

Give a reason for your choice.

breed of sheep .....

reason .....

.....

.....

[2]

**(b)** Another farmer wants to produce a new breed of sheep with both a very good milk yield and a very good quality of wool.

The farmer is able to buy any of the breeds of sheep shown in Table 10.1.

Describe the process this farmer would use to produce the new breed of sheep on her farm.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

[Total: 6]

**BLANK PAGE**