AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 4.5.1

# Homeostasis

## Past-paper questions

| | |
|---|---|
| Tier | **Foundation** |
| Question groups | **4** |
| Available paper years | **2019–2024** |

## Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

**Name:** _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

### 4.5.1 Homeostasis

**Question 01**

June 2019 | 8464/B/2F | Original Q1

**0 1** Conditions inside the human body are controlled.

**0 1 . 1** What is the control of conditions inside the body called?

**[1 mark]**

Tick (✓) **one** box.

- Excretion ☐
- Fertilisation ☐
- Homeostasis ☐
- Osmosis ☐

**0 1 . 2** What are the **two** ways information is sent to control body conditions?

**[2 marks]**

Tick (✓) **two** boxes.

- By antigens ☐
- By hormones ☐
- By muscles ☐
- By nerve impulses ☐
- By red blood cells ☐

**0 1 . 3** One condition in the body that needs to be controlled is the level of water.

Give **one** other condition in the human body that needs to be controlled.

**[1 mark]**

4.5.1 Homeostasis

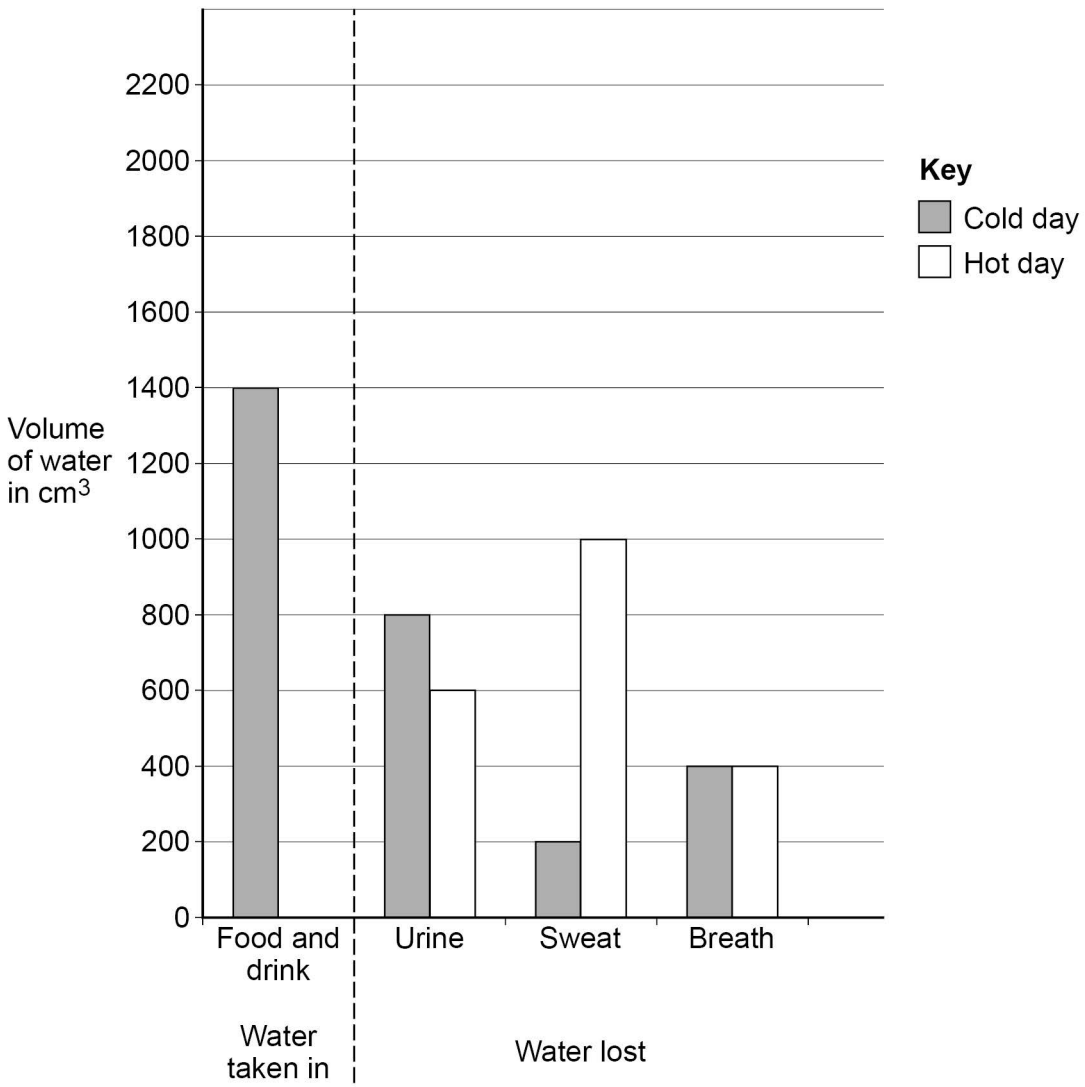
Question 01 · continued



**Figure 1** shows the volumes of water taken in and lost by one person.

The volume for water taken in on a hot day has **not** been plotted on the bar graph.

**Figure 1**




**0 1 . 4** The person lost 1400 $cm^3$ of water on the cold day.

How much extra water did they lose on the hot day?

**[2 marks]**

Extra volume of water lost = _____ $cm^3$

4.5.1 Homeostasis

Question 01 · continued



**0 1 . 5** Explain why the volume of water lost on a hot day is higher than on a cold day.

**[2 marks]**

**0 1 . 6** A boy drank 750 $cm^3$ of water.

His total intake of water for that day was 3000 $cm^3$

Calculate the percentage of the boy's total intake that the 750 $cm^3$ represents.

**[2 marks]**

Percentage = _____ %

**10**

### 4.5.1 Homeostasis

**Question 02**

November 2020 | 8464/B/2F | Original Q4

**0 4** Homeostasis regulates the internal conditions of the human body.

**0 4 . 1** Which **two** processes are regulated by homeostasis?

**[2 marks]**

Tick (✓) **two** boxes.

- Controlling water output in urine ☐
- Defending the body against pathogens ☐
- How quickly you walk ☐
- Keeping cool on a hot day ☐
- Waking up in the morning ☐

4.5.1 Homeostasis

Question 02 · continued

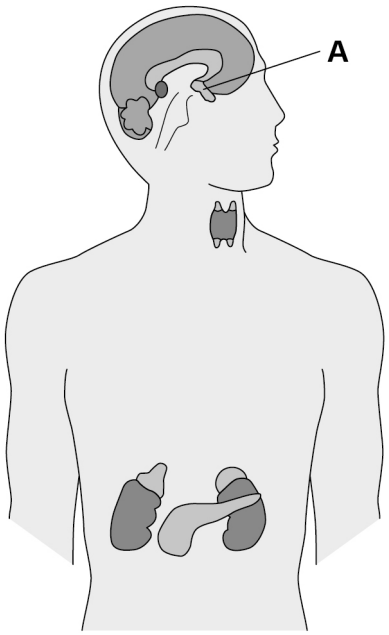


Hormones are produced by glands in the endocrine system.

Each hormone has an effect on a target organ.

**Figure 6** shows glands of the endocrine system.

**Figure 6**




**0 4 . 2** What is the name of gland **A**?

**[1 mark]**

Tick (✓) **one** box.

Pancreas ☐

Pituitary ☐

Thyroid ☐

**Question 4 continues on the next page**

Before eating a sugar-coated cereal a person had a blood glucose concentration of 5.2 mmol/dm$^3$

Soon after eating the cereal the person had a blood glucose concentration of 8.4 mmol/dm$^3$

**0 4 . 3** Calculate the increase in the blood glucose concentration.

**[1 mark]**

Increase = _____ mmol/dm$^3$

**0 4 . 4** The person needed medication to decrease their blood glucose concentration.

Suggest what disorder the person has.

**[1 mark]**

**0 4 . 5** There is a problem with the hormone control of the person.

What is the problem?

**[1 mark]**

Tick (✓) **one** box.

The blood is not taking hormones to target organs. ☐

The pancreas is not releasing insulin. ☐

The pituitary gland is not being stimulated. ☐

4.5.1 Homeostasis

Question 02 · continued



**0 4 . 6** The person:

- works in an office
- drives to work
- is overweight
- watches the television and reads every night
- drinks a hot chocolate every night.

Suggest **two** lifestyle changes the person could make to help treat their disorder.

**[2 marks]**

1 _____

_____

2 _____

_____

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**Turn over for the next question**

### 4.5.1 Homeostasis

**Question 03**

June 2023 | 8464/B/2F | Original Q5

**0 5** Homeostasis is the control of internal body conditions.

Control of body temperature is an example of homeostasis.

**0 5 . 1** Draw **one** line from each part involved in temperature control to the function of that part.

**[3 marks]**

| Part involved in temperature control | Function |
|---|---|
| | Changes air temperature outside the body |
| Brain | |
| | Contracts to increase body temperature |
| Muscle | |
| | Coordinates information about body temperature |
| Receptor | |
| | Detects changes in skin temperature |

4.5.1 Homeostasis

Question 03 · continued



**0 5 . 2** Why is homeostasis important?

**[2 marks]**

Tick (✓) **two** boxes.

- To allow cells to function properly ☐
- To change body temperature to match air temperature ☐
- To decrease water levels in the body throughout the day ☐
- To maintain the optimum conditions for enzymes ☐
- To prevent reactions inside cells ☐

**Question 5 continues on the next page**

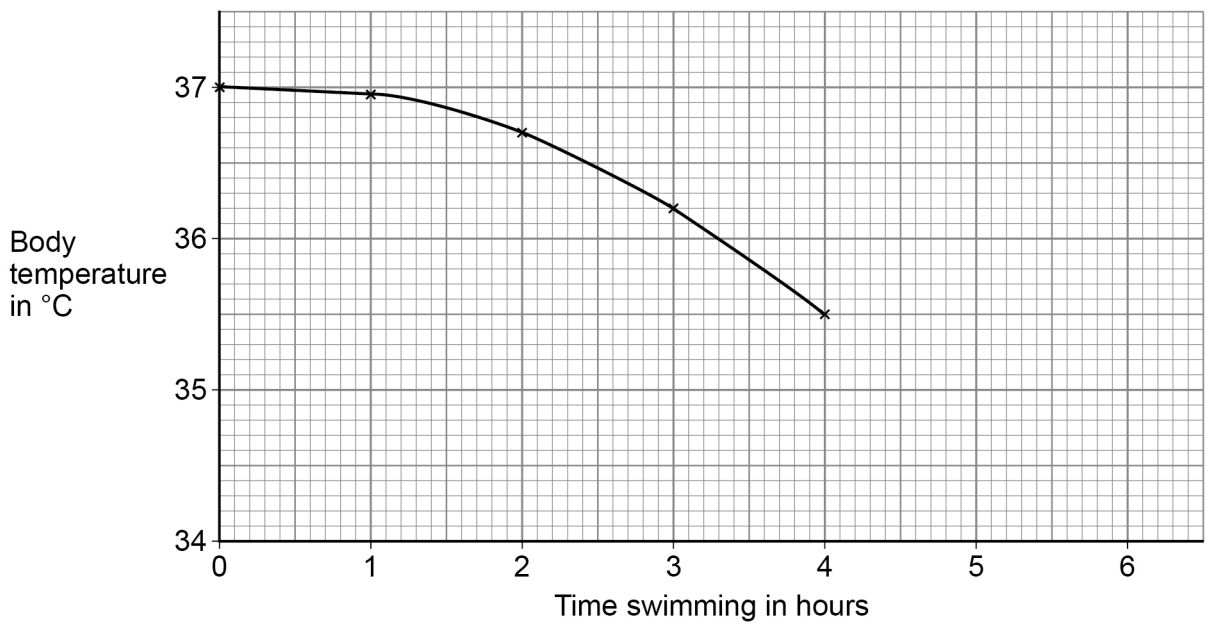
Question 03 · continued



The body temperature of a long-distance swimmer can change with the length of time swimming in cold water.

**Figure 6** shows how the body temperature of one swimmer changed in the first 4 hours of a 6-hour swim.

**Figure 6**




**0 5 . 3** Describe the trend shown in **Figure 6**.

**[1 mark]**

4.5.1 Homeostasis

Question 03 · continued



**0 5 . 4** Determine the change in body temperature in the first 4 hours of the swim.

**[2 marks]**

Change in body temperature = _____ °C

**0 5 . 5** Hypothermia is a dangerously low body temperature of 35 °C or colder.

Predict when the swimmer was **first** at risk of hypothermia.

You should extend the line on **Figure 6**.

**[2 marks]**

Prediction = _____ hours

**Question 5 continues on the next page**

Swimming in cold water decreases the insulin concentration in the blood.

**0 5 . 6** Complete the sentence.

Choose the answer from the box.

**[1 mark]**

| | | |
|---|---|---|
| **heart** | **pancreas** | **stomach** |

Insulin is produced by the _____ .

**0 5 . 7** Insulin is a hormone.

Which organ system produces hormones?

**[1 mark]**

_____

**0 5 . 8** Complete the sentence.

Choose the answer from the box.

**[1 mark]**

| | | |
|---|---|---|
| **decrease** | **stay the same** | **increase** |

When insulin concentration in the blood increases, blood glucose concentration will _____ .

**0 5 . 9** Give **one** risk factor for Type 2 diabetes.

**[1 mark]**

_____

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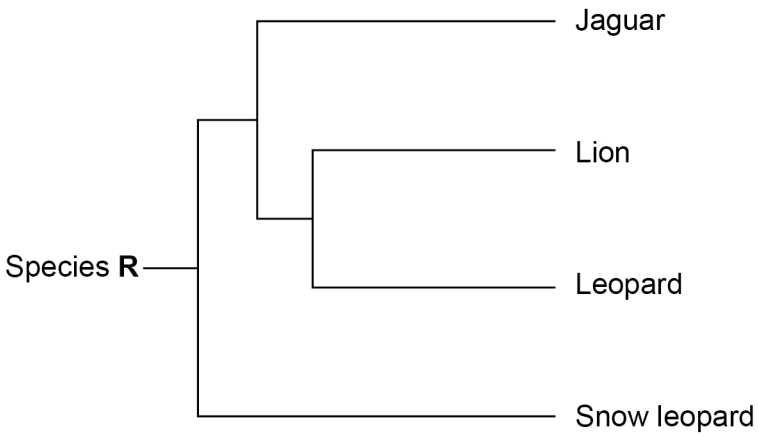
4.5.1 Homeostasis

Question 04



**0 4** **Figure 8** shows an evolutionary tree.

**Figure 8**




**0 4 . 1** Which species in **Figure 8** is most closely related to lions?

**[1 mark]**

Tick (✓) **one** box.

Jaguar ☐

Leopard ☐

Snow leopard ☐

**0 4 . 2** Tigers are more closely related to snow leopards than to jaguars.

Draw a line on **Figure 8** to show the evolution of tigers.

Label the line 'Tiger'.

**[1 mark]**

**0 4 . 3** What is represented by species **R** on **Figure 8**?

**[1 mark]**

Tick (✓) **one** box.

A species recently evolved from jaguars. ☐

A species that may evolve in the future. ☐

A species that the other species evolved from. ☐

**0 4 . 4** Complete the sentence.

Choose the answer from the box.

**[1 mark]**

| classification | homeostasis | natural selection |
|---|---|---|

Evolution occurs by the process of _____.

**0 4 . 5** Species can become extinct.

Give **two** possible causes of extinction.

**[2 marks]**

1 _____

_____

2 _____

_____

**Question 4 continues on the next page**

**0 4 . 6** Fossils are used to study the evolution of some species.

Suggest **one** reason why fossils are used to study evolution.

**[1 mark]**

Some bacteria have evolved to be resistant to penicillin.

Penicillin is an antibiotic.

**0 4 . 7** How has the process of evolution produced bacteria that are resistant to penicillin?

Write the stages, **A**, **B**, **C**, **D** and **E** in the correct order.

The first stage has been completed for you.

**[3 marks]**

**A** The bacteria with mutations are more likely to survive.

**B** The population of bacteria is exposed to penicillin.

**C** The mutation for resistance to penicillin is passed on to offspring.

**D** Variation in the population of bacteria is caused by mutation.

**E** The surviving bacteria reproduce.

**D** → _____ → _____ → _____ → _____

4.5.1 Homeostasis

Question 04 · continued



**0 4 . 8** New antibiotics are **not** likely to control the spread of bacteria that are resistant to antibiotics.

What are **two** reasons why?

**[2 marks]**

Tick (✓) **two** boxes.

- Antibiotics kill all types of bacteria. ☐
- Antibiotic resistant bacteria will continue to evolve. ☐
- Bacteria reproduce very rapidly. ☐
- New antibiotics are cheap to produce. ☐
- Testing new antibiotics is quick. ☐

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**Turn over for the next question**