

GCSE Combined Science: Trilogy

Worksheet: Homeostasis

TIME 30 min	TOTAL 30 marks	CALCULATOR Allowed	DIFFICULTY Easy, Medium
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Topics: Homeostasis

NAME	CLASS	DATE
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- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Answer all questions in the spaces provided.
- In all calculations, show clearly how you work out your answer.
- The marks for questions are shown in brackets.

0 1

Automatic control systems in the body keep internal conditions within a narrow range.

0 1 . 1

Complete the sentences using the words **receptor**, **coordination centre** and **effector**.

The detects a change (a stimulus).

The receives and processes the information.

The brings about a response.

.....

.....

.....

.....

.....

.....

[3 marks]

0 1 . 2

Which of these is an example of a coordination centre?

Tick (✓) **one** box.

A muscle

☐

A sweat gland

☐

The brain

☐

A temperature receptor in the skin

☐

[1 mark]

0 1 . 3

Give **one** example of an internal condition of the body that must be kept within a narrow range.

.....

.....

[1 mark]

0 2

All the automatic control systems in the body include receptors, coordination centres and effectors.

0 2 . 1

What is the function of receptors?

.....

.....

[1 mark]

0 2 . 2

Give **two** examples of coordination centres in the human body.

.....

.....

.....

.....

[2 marks]

0 2 . 3

Give the **two** types of effector.

.....

.....

.....

.....

[2 marks]

0 2 . 4

Complete the sentence.

Automatic control systems may involve nervous responses or responses.

.....

.....

.....

.....
[1 mark]

0 3

Homeostasis is important for the human body to work properly.

0 3 . 1

What is meant by **homeostasis**?

.....

.....

.....

.....

[2 marks]

0 3 . 2

Which **three** of these are controlled by homeostasis in the human body?

Tick (✓) **three** boxes.

Blood glucose concentration

☐

Body temperature

☐

Eye colour

☐

Height

☐

Water levels

☐

[3 marks]

0 3 . 3

Homeostasis maintains the optimum conditions for the molecules that control reactions in cells.

Name these molecules.

.....

.....

.....

[1 mark]

0 4

These steps happen in one automatic control system in the body.

1. Body temperature increases.
2. Temperature receptors in the skin detect the change.
3. Nerve impulses travel to the brain.
4. The brain sends nerve impulses to the sweat glands.
5. The sweat glands produce more sweat.
6. Body temperature decreases.

0 4 . 1

Name the receptors in this control system.

.....

.....

[1 mark]

0 4 . 2

Name the coordination centre.

.....

.....

.....

.....

[1 mark]

0 4 . 3

Name the effectors.

.....

.....

.....

.....

[1 mark]

0 4 . 4

Is this a nervous response or a chemical response?
Give a reason for your answer.

.....

.....

.....

.....

[2 marks]

0 4 . 5

Explain why step 6 is important.

.....

.....

.....

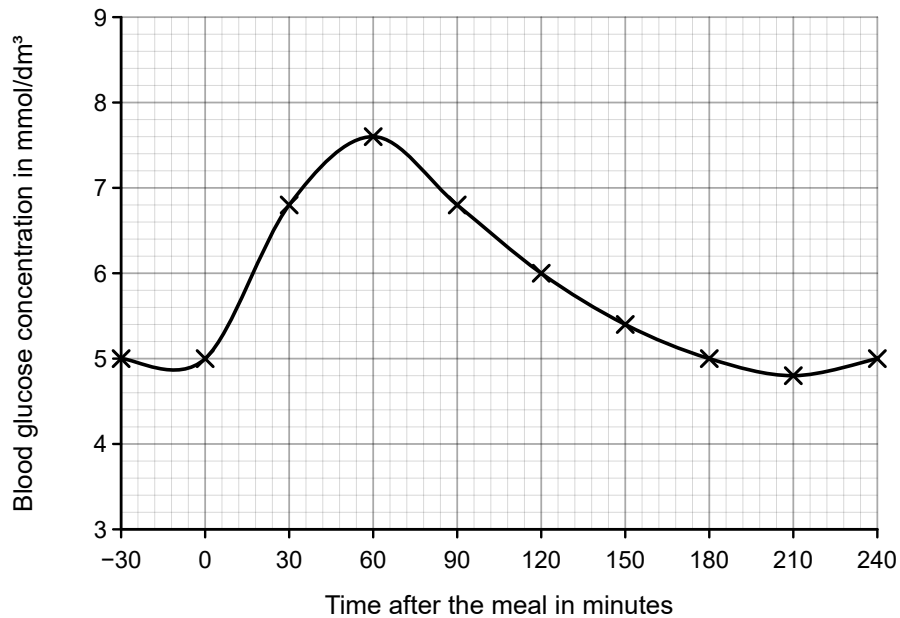
.....

[2 marks]

0 5

Figure 1 shows the blood glucose concentration of a healthy person before and after eating a meal at time 0.

Figure 1



0 5 . 1

What was the maximum blood glucose concentration?

.....

.....

.....

Maximum concentration = mmol/dm³

[1 mark]

0 5 . 2

Calculate the mean rate at which the blood glucose concentration fell between 60 minutes and 180 minutes.

Give your answer in mmol/dm³ per hour.

.....

.....

.....

.....

Mean rate = mmol/dm³ per hour

[2 marks]

0 5 . 3

Explain how the changes shown in Figure 1 are an example of homeostasis.

.....

.....

.....

.....

[2 marks]

0 5 . 4

Name the organ that acts as the coordination centre for controlling blood glucose concentration.

.....

.....

.....

.....

[1 mark]

END OF QUESTIONS

Original practice questions written to match the specification. Not produced by, affiliated with or endorsed by AQA.

Mark scheme

GCSE Combined Science: Trilogy · Worksheet: Homeostasis · 30 marks

Question 1 (5 marks)

01.1 [3 marks]

Answer: receptor; coordination centre; effector

- receptor (1)
 - coordination centre (1)
 - effector (1)
-

01.2 [1 mark]

Correct: The brain

01.3 [1 mark]

- body temperature (1)
- blood glucose concentration (1)
- water content of the body (1)

Any 1 of the points above.

Question 2 (6 marks)

02.1 [1 mark]

- to detect stimuli / changes in the environment (1)
-

02.2 [2 marks]

- brain (1)
- spinal cord (1)
- pancreas (1)

Any 2 of the points above.

02.3 [2 marks]

Answer: Muscles and glands

- muscles (1)
 - glands (1)
-

02.4 [1 mark]

Answer: chemical (hormonal)

- chemical (1)
-

Question 3 (6 marks)

03.1 [2 marks]

- the regulation of the internal conditions (of a cell or organism) (1)
 - to maintain optimum conditions for function (in response to internal and external changes) (1)
-

03.2 [3 marks]

Correct: Blood glucose concentration; Body temperature; Water levels

03.3 [1 mark]

Answer: Enzymes

- enzymes (1)
-

Question 4 (7 marks)

04.1 [1 mark]

- temperature receptors (in the skin) (1)
-

04.2 [1 mark]

Answer: The brain

- brain (1)
-

04.3 [1 mark]

Answer: Sweat glands

- sweat glands (1)
-

04.4 [2 marks]

- nervous (1)
 - it uses nerve impulses / neurones (not hormones) (1)
-

04.5 [2 marks]

- it returns body temperature to the optimum (1)
 - (so) enzymes work at their optimum rate / are not denatured (1)
-

Question 5 (6 marks)

05.1 [1 mark]

Answer: 7.6 mmol/dm³

- 7.6 (mmol/dm³) (1)

05.2 [2 marks]

Answer: 1.3 mmol/dm³ per hour

- $(7.6 - 5.0) \div 2$ (1)
- 1.3 (mmol/dm³ per hour) (1)

Notes: Allow readings within ± 0.1 mmol/dm³ (answers of 1.2–1.4). An answer of 0.022 (per minute, not converted to per hour) scores 1 mark.

05.3 [2 marks]

- the blood glucose concentration rose after the meal, and this change was detected (by receptors) (1)
- the body responded automatically to bring the concentration back to its normal level (about 5 mmol/dm³) / to keep it within narrow limits (1)

05.4 [1 mark]

Answer: Pancreas

- pancreas (1)
-