

Homeostasis and temperature control: practice questions

5 questions • 16 marks • mark scheme at the back

For Edexcel GCSE Biology 1BI0 and Combined Science 1SC0. **Triple only** is not in Combined Science. **Higher tier** is only on the Higher paper.

Name

Total / 16

- 1** Explain why it is important for the body to maintain a constant internal environment when conditions outside the body change. **[2 marks]**

- 2** **Triple only** **[3 marks]**
Explain why core body temperature must not rise far above 37°C.

- 3** **Triple only** **[2 marks]**
A person drinks a large amount of water and the blood becomes too dilute. Explain the effect this could have on animal cells.

- 4** **Triple only** **[3 marks]**
Describe the roles of the hypothalamus and the dermis in controlling body temperature.

5

Triple only

Higher tier

[6 marks]

A person walks from a warm building into very cold air. Explain how the body responds to keep core body temperature constant.

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Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [2]

- enzymes work best at their optimum conditions / within narrow limits (1)
- so cells can function properly / reactions continue at a suitable rate (1)

2. [3] Triple only

- high temperature denatures enzymes / changes the shape of the active site (1)
- the substrate no longer fits the active site (1)
- so reactions in the cells slow down or stop (1)

3. [2] Triple only

- water enters the cells by osmosis (1)
- the cells swell and may burst (1)

4. [3] Triple only

- the hypothalamus monitors blood temperature / receives impulses from skin temperature receptors (1)
- the hypothalamus coordinates the response / sends nerve impulses to effectors (1)
- the dermis contains the sweat glands / blood vessels / temperature receptors (1)

5. [6] Triple only Higher tier

Level 3 5-6	A detailed explanation that links detection by the hypothalamus to at least two responses, including shivering and vasoconstriction, and explains how each helps keep body temperature constant.
Level 2 3-4	Some explanation with at least one response linked to its effect on body temperature. Detection or a second response may be missing or incomplete.
Level 1 1-2	Simple statements about the body responding to cold, with little or no explanation.

Indicative content

- temperature receptors in the skin and the hypothalamus detect the fall in temperature
- the hypothalamus sends nerve impulses to effectors
- shivering: muscles contract rapidly
- respiration in the muscles releases heat, warming the body
- vasoconstriction: blood vessels supplying the skin surface narrow
- less blood flows near the skin surface so less heat is lost
- sweating is reduced
- temperature returns to about 37°C, which is negative feedback