

Homeostasis: practice questions

7 questions • 20 marks • mark scheme at the back

For Cambridge IGCSE Biology 0610 (and 0970, which has the same content). **Supplement** is Extended content, only examined on Papers 2 and 4.

Name

Total / 20

1 Which statement describes homeostasis? [1 mark]

- A. ☐ Responding to a stimulus
- B. ☐ Maintaining a constant internal environment
- C. ☐ Producing hormones in a gland
- D. ☐ Releasing energy from food

2 After a meal rich in carbohydrate, the concentration of glucose in the blood rises. Name the hormone that decreases the blood glucose concentration and name the organ that secretes it. [2 marks]

3 **Supplement** [4 marks]

Explain how negative feedback keeps the blood glucose concentration close to a set point.

4

Supplement

[5 marks]

Describe how the blood glucose concentration is controlled after a meal and several hours later, when the concentration has fallen. Refer to the pancreas, the liver, insulin and glucagon.

5

Supplement

[3 marks]

Outline the treatment of Type 1 diabetes.

6

Supplement

[1 mark]

A person exercises and their body temperature starts to rise. Which change occurs in the skin?

- A. ☐ The arterioles supplying the skin surface capillaries narrow
- B. ☐ The arterioles supplying the skin surface capillaries widen
- C. ☐ The hair erector muscles contract
- D. ☐ Shivering begins

7

Supplement

[4 marks]

Explain how a mammal responds to a fall in the temperature of its surroundings, to keep its internal body temperature constant.

Mark scheme

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

1. [1]

B B (1)

2. [2]

- insulin (1)
- pancreas (1)

3. [4] **Supplement**

- the set point is the normal level / concentration of blood glucose (1)
- a change away from the set point is detected (1)
- a response occurs that reverses the change / brings the concentration back towards the set point (1)
- for example, if too high, insulin is secreted which lowers it / if too low, glucagon is secreted which raises it (1)
- when the set point is reached the response reduces / stops (1)
- Max 4

4. [5] **Supplement**

- after a meal, blood glucose concentration rises and the pancreas secretes insulin (1)
- insulin causes the liver to convert glucose to glycogen (1)
- blood glucose concentration decreases (1)
- when the concentration falls too low, the pancreas secretes glucagon (1)
- glucagon causes the liver to convert glycogen to glucose, released into the blood (1)
- blood glucose concentration increases (1)
- Max 5

5. [3] **Supplement**

- insulin injections (1)
- monitor / test blood glucose concentration (1)
- control the diet / amount of carbohydrate eaten (1)
- injected at mealtimes / dose matched to glucose concentration (1)
- Max 3

6. [1] **Supplement**

B B (1)

7. [4] **Supplement**

- receptors detect the change / the brain coordinates the response (1)
- vasoconstriction: arterioles supplying skin surface capillaries narrow (1)
- less blood flows near the skin surface so less heat is lost (1)
- shivering: muscles contract, respiration releases heat (1)
- hair erector muscles raise the hairs to trap air (insulation) (1)
- no sweating / less sweating (1)
- Max 4