FOUNDATION

B5F Homeostasis and Response: Foundation Tier Practice

AQA 8461 · Calculator allowed · about 75 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Homeostasis keeps the internal conditions of the body stable.

Give one example of an internal condition that is controlled by homeostasis.

(Total for Question 1 is 1 mark)

---

2 The pancreas produces hormones that control blood glucose.

Name the hormone produced by the pancreas that lowers blood glucose concentration.

(Total for Question 2 is 1 mark)

---

3 Negative feedback helps return a condition to its normal value.

Explain in one sentence how negative feedback works when blood glucose is too high.

(Total for Question 3 is 2 marks)

---

4 A person drinks a sugary drink and their blood glucose rises from 4.5 mmol per litre to 6.5 mmol per litre.

Calculate the increase in blood glucose concentration in mmol per litre.

(Total for Question 4 is 2 marks)

5 The kidneys filter blood and adjust water content in urine.

Name the hormone that increases water reabsorption in the kidneys.

(Total for Question 5 is 1 mark)

---

6 A simple investigation measures pupil size in bright and dim light. Results: bright light pupil diameter average 2.0 mm, dim light pupil diameter average 6.0 mm.

Calculate the difference in pupil diameter between bright and dim light. Then state which change is a reflex that helps protect the retina.

(Total for Question 6 is 3 marks)

---

7 Type 1 diabetes is a condition where the pancreas cannot produce insulin.

Give one common treatment for a person with type 1 diabetes, and give one other way their condition is managed day to day.

(Total for Question 7 is 2 marks)

---

8 Reflex actions are rapid and involuntary. Consider the pathway for a simple reflex triggered by touching a hot object.

Complete the sequence for the reflex arc: stimulus -> receptor -> ? -> effector -> response. Name the missing part of the pathway and briefly state its role.

(Total for Question 8 is 2 marks)

9 The skin helps regulate body temperature by sweating and changing blood flow. When the body is too hot, blood flow to the skin increases.

State one way blood flow to the skin changes to help cool the body, and explain how this helps cooling.

(Total for Question 9 is 2 marks)

Mark scheme · B5F Homeostasis and Response: Foundation Tier Practice

Question 1

- **B1** one valid example such as body temperature, blood glucose concentration, water balance, or ion concentration
- **Answer: Any one of: body temperature; blood glucose concentration; water balance; ion concentration.**

Question 2

- **B1** insulin cao
- **Answer: Insulin**

Question 3

- **B1** increase in blood glucose is detected by the pancreas or sensors, oe
- **B1** pancreas releases insulin which causes cells to take up glucose and restores concentration back to normal, oe
- **Answer: Pancreas detects high blood glucose and releases insulin so cells take up glucose, returning blood glucose to normal.**

Question 4

- **M1** calculates difference: 6.5 - 4.5
- **A1** 2.0 mmol per litre cao
- **Answer: 2.0 mmol per litre**

Question 5

- **B1** antidiuretic hormone or ADH cao
- **Answer: Antidiuretic hormone (ADH)**

Question 6

- **M1** calculates difference: 6.0 - 2.0
- **A1** 4.0 mm cao
- **B1** state: pupils constrict in bright light to protect the retina or pupils dilate in dim light to let more light in, oe (accept either phrasing that mentions protection)
- **Answer: Difference 4.0 mm. Pupil constriction in bright light protects the retina.**

Question 7

- **B1** insulin injections or use of an insulin pump
- **B1** and a brief acceptable additional point such as monitoring blood glucose or a controlled diet, oe
- **Answer: Insulin injections or an insulin pump; plus monitoring blood glucose levels.**

Question 8

- **B1** relay neurone or coordination centre or spinal cord (accept relay neuron or coordinator)
- **B1** brief role: transmits the signal from the receptor to the effector or connects sensory and motor neurones, oe
- **Answer: relay neurone**

Question 9

- **B1** blood vessels near the skin widen (vasodilation) so more blood flows to the skin, oe
- **B1** explanation: increased blood at the skin allows more heat to be lost to the environment by radiation and evaporation, oe
- **Answer: Blood vessels widen (vasodilation), increasing blood flow to the skin so more heat is lost by radiation and evaporation.**