

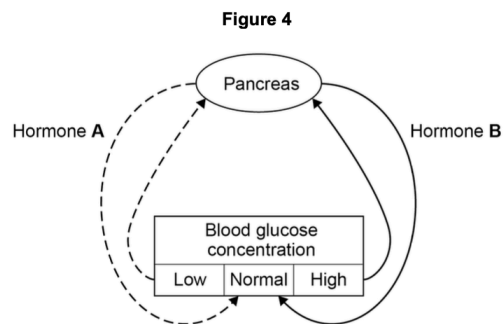
Homeostasis and control systems

Q1. (2022)

0 5

Blood glucose concentration in the human body needs to be kept within the normal range.

Figure 4 shows that two hormones control blood glucose concentration.



0 5 . 1

Name the type of hormonal control shown in Figure 4.

[1 mark]

Q2. (2023)

0 6

The control of body temperature is an example of homeostasis.

A)

0 6 . 1

Give **one** other internal condition controlled by homeostasis.

Do **not** refer to temperature in your answer.

[1 mark]

B)

0 6 . 2

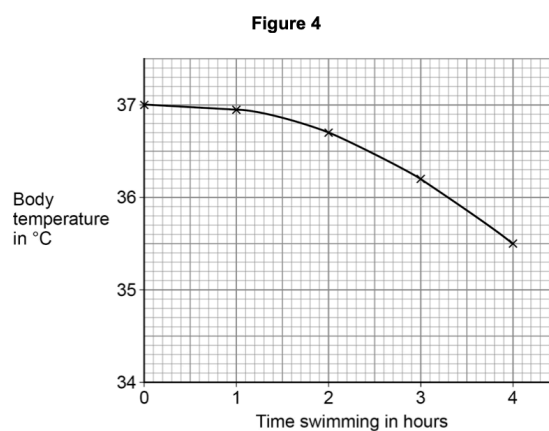
Explain why the control of body temperature is important.

[2 marks]

Q3. (2023)

The body temperature of long-distance swimmers can change as the length of time swimming in cold water increases.

Figure 4 shows how the body temperature of one swimmer changed in the first 4 hours of a long-distance swim.



A)

0 6 . 3

Calculate the mean rate of body temperature decrease per hour in the first 4 hours of the swim.

[2 marks]

Rate = _____ °C per hour

B)

0 6 . 4

Hypothermia is a dangerously low body temperature.

For this swimmer, a 5.5% decrease in body temperature from the start of the swim will cause hypothermia.

Determine the body temperature at which this swimmer will start to have hypothermia.

Give your answer to 2 significant figures.

[4 marks]

Body temperature (2 significant figures) = _____ °C

Q4. (2024)

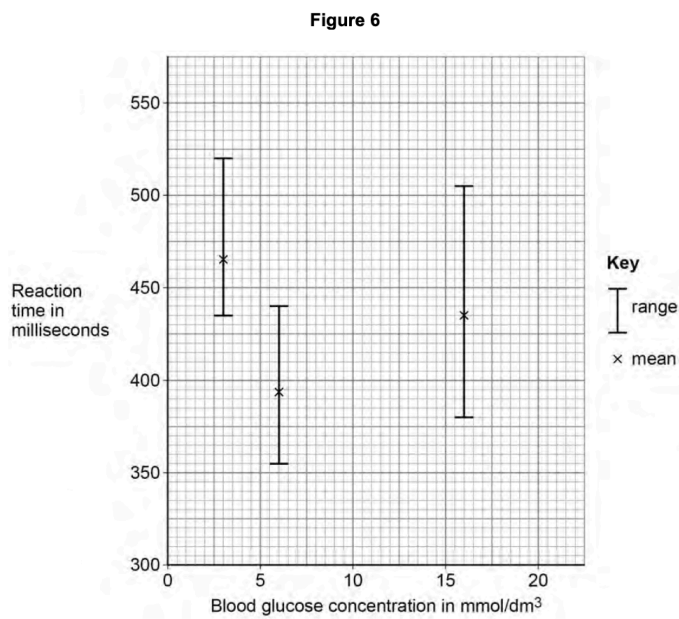
Scientists investigated whether blood glucose concentration affects reaction time.

The reaction times of ten people with Type 1 diabetes were measured.

This is the method used.

1. Tell one person to drink a glucose solution.
2. Monitor the person's blood glucose concentration.
3. Record the person's reaction time when the person's blood glucose concentration is:
 - 16 mmol/dm³
 - 6 mmol/dm³
 - 3 mmol/dm³
4. Repeat steps 1 to 3 for the nine other people.

Figure 6 shows the results.



A)

06.7 People who do **not** have diabetes usually have a blood glucose concentration in the range of 4.0 mmol/dm³ to 7.8 mmol/dm³.

Describe how the results in **Figure 6** show the importance of homeostasis.

[2 marks]

B)

06.8 Describe how blood glucose concentration is maintained within narrow limits in people who do **not** have diabetes.

[5 marks]