

TWENTY FIRST CENTURY
science

Module B4

HOMEOSTASIS

Practice test

FOUNDATION

Name:

Form/teaching set:

Answer all of the questions.

Write your answers in the spaces provided on this paper.

1 The amount of water in the body is controlled by balancing water intake and water loss:

total volume of water gained = total volume of water lost

(a) The table gives information about the amount of water a person gained and lost in one day.

water gained in the day (cm ³)		water lost during the day (cm ³)	
in food	900	in urine	1400
as drinks	through sweating	500
by respiration	300	breathing	350
		in faeces	150
total water gain	2400	total water loss

Complete the table to show:

(i) the volume of water gained from drinks during the day. [1]

(ii) the total volume of water lost during the day. [1]

(b) (i) Did the person drink the right amount during the day?

Put a tick (✓) in the **one** correct box.

drank too little

drank the right amount

drank too much

[1]

(ii) What is the reason for your answer to part b(i)?

Put a tick (✓) in the **one** correct box.

water gained is more than water lost

water gained equals water lost

water gained is less than water lost

[1]

(c) Complete the following sentences about the effect of exercise on water balance.

Use words from the list.

fresh less more sweat urine water

When exercising we produce sweat to help cool the body.

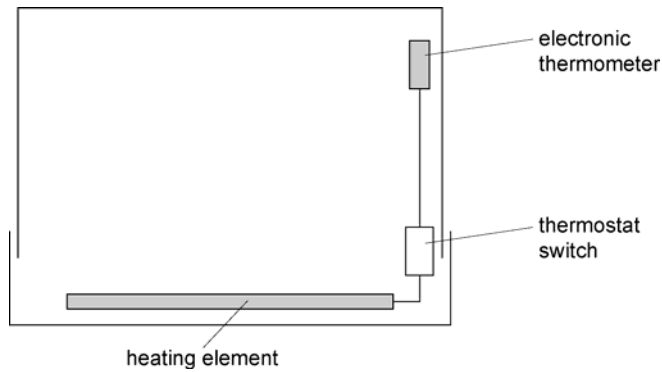
This means we produce less because more
..... is reabsorbed by the kidneys to keep the body's water
balance correct.

[3]

[Total marks: 7]

2 Premature babies are kept in incubators.

The incubator controls the temperature around the baby.



(a) Draw one straight line from each **component job** of the correct **component name**.

component job	component name
sensor	heating element
processor	thermostat switch
effector	electronic thermometer

[2]

(b) What is the correct name for this sort of system of temperature control?

Draw a **ring** around the correct name.

homeostasis

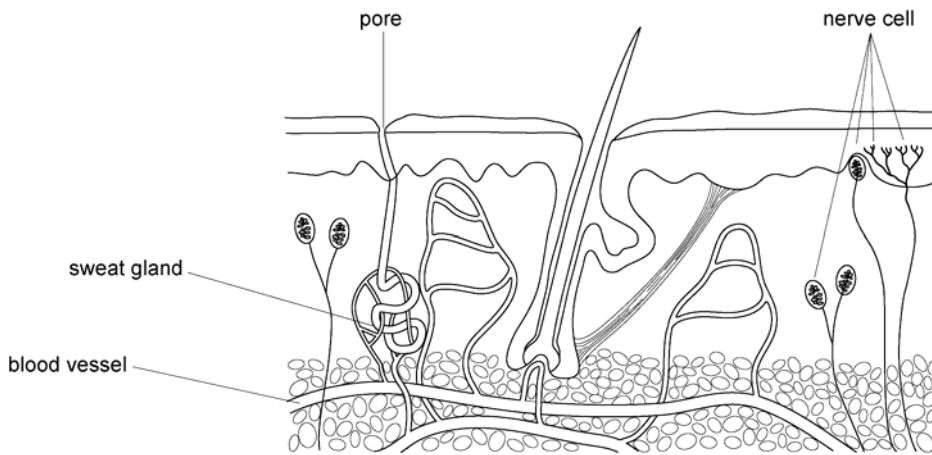
negative feedback

positive feedback

[1]

[Total marks: 3]

3



(a) The diagram shows a cross-section of human skin. The labels show different parts.

The following sentences say what some parts do.

- A: Blood vessels contract, reducing blood flow to the skin.
- B: Nerve cells detect temperature.
- C: Blood vessels dilate, allowing more blood to the skin.
- D: Sweat glands produce sweat.

Complete the table to show the effect each one has on body temperature.

Put **each** letter **A**, **B**, **C** and **D** in the correct column of the table.

increases body temperature	no effect on body temperature	decreases body temperature

[3]

(b) How is the heat transferred from the core of the body to the skin?

..... [1]

[Total marks: 4]

Adrift at sea

In May 2005, two boys on a shark-fishing trip, were blown out to sea in their sailing boat. The two 17-year-old boys were adrift in their boat without food or fresh water for six days. They survived on seawater and raw jellyfish.

When rescued, the boys were sunburned, dehydrated and exhausted, but otherwise in pretty good shape. They were taken to hospital to be treated.

The pair quenched their thirst with seawater and slipped into the ocean to cool off, but sharks chased them back onto the boat. At night, they used a single wet suit to keep warm.

(a) Choose words from the list to complete the sentences.

active transport

enzyme

heat stroke

homeostasis

hypothermia

The boys were too hot during the day which made them suffer from

.....

At night it was very cold and they may have suffered from

The boys' bodies tried to keep them at the right temperature. This process is

called

[3]

(b) At night the boys had to share a wet suit, which helped to keep them warm.

Describe how the body tries to prevent itself getting too cold.

.....
.....
.....

[2]

(c) Suggest one treatment which the boys may have received when they were taken to hospital.

.....
.....

[1]

[Total marks: 6]

[Total marks for the test: 20]

TWENTY FIRST CENTURY
science

Module B4

HOMEOSTASIS

Practice test

HIGHER

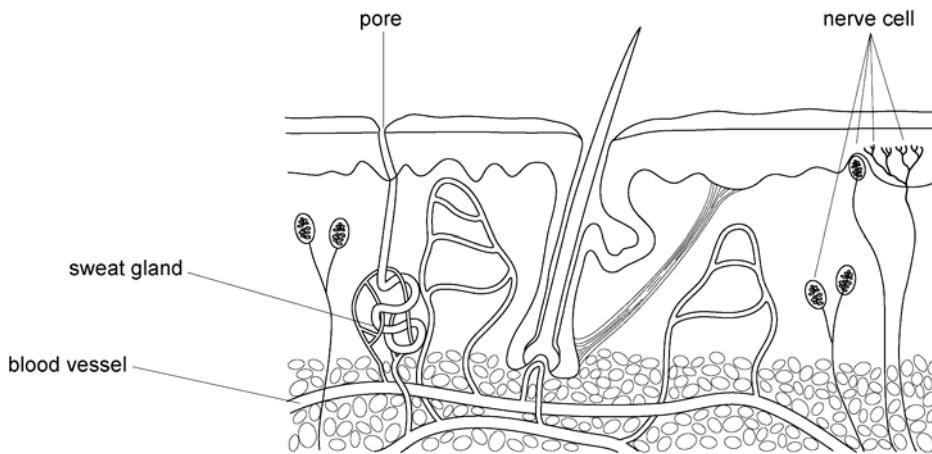
Name:

Form/teaching set:

Answer all of the questions.

Write your answers in the spaces provided on this paper.

1



(a) The diagram shows a cross-section of human skin. The labels show different parts.

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[3]

(b) How is the heat transferred from the core of the body to the skin?

..... [1]

[Total marks: 4]

2 The control of blood sugar levels is a negative feedback system.

Read the following passage.

Blood glucose levels are monitored by the islets of Langerhans in the pancreas. If levels get too high, beta cells in the islets secrete insulin. If blood glucose gets too low, alpha cells secrete glucagon.

Insulin is a hormone. It increases the concentration of glucose in the blood.

Glucagon, also a hormone, decreases the concentration of glucose in the blood.

(a) Write down the name of a **sensor** in this system.

..... [1]

(b) Write down the name of an **effector** in this system.

..... [1]

[Total marks: 2]

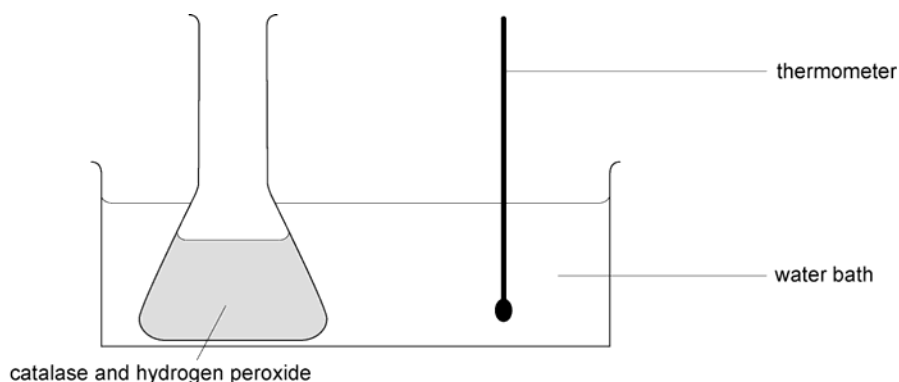
3 Hydrogen peroxide is a waste chemical made in body cells.

Hydrogen peroxide is broken down in cells by the enzyme catalase.

(a) What is the name of the part of the catalase molecule where the reaction takes place?

..... [1]

(b) A student measures the rate at which catalase breaks down a solution of hydrogen peroxide. The diagram shows the apparatus used.



Draw a **ring** around the water bath temperature at which the reaction would be fastest.

5 °C 15 °C 25 °C 35 °C 55 °C

[1]

(c) The following statements explain why the reaction would be slower at higher temperatures than the one you have chosen.

A: The mixture is at a high temperature.

B: Hydrogen peroxide will no longer fit the enzyme.

C: The shape of the enzyme is changed.

D: Collisions are more energetic.

E: Less hydrogen peroxide breaks down.

F: Particles move faster.

(i) Put the statements in the correct order to make an explanation.

The first one has been done for you.

A					
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[4]

(ii) Which **two** of the statements above explain why, below the temperature you have chosen, the rate of reaction increases with temperature?

.....

[2]

[Total marks: 8]

Adrift at sea

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The pair quenched their thirst with seawater and slipped into the ocean to cool off, but sharks chased them back onto the boat. At night, they used a single wet suit to keep warm.

(a) At night the boys had to share a wet suit, which helped to insulate them to keep them warm.

Describe two ways in which the body tries to prevent itself getting too cold.

1

.....

2

.....

[2]

(b) Suggest one treatment which the boys may have received when they were taken to hospital.

.....

.....

[1]

(c) Sea water contains high concentrations of salt.

Explain how drinking seawater would result in dehydration.

Your answer should include the roles of

- the hypothalamus
- ADH
- the kidney.

.....

.....

.....

.....

..... [3]

[Total marks: 6]

[Total marks for the test: 20]