

Controlling Body Temperature 2

Q:1 Conditions inside the body must be kept constant.

(a) Urea must be removed from the body.

(a) (i) Name the organ which makes urea.

(1 mark)

(a) (ii) Which organ removes urea from the body?

(1 mark)

(a) (iii) What is urea made from?

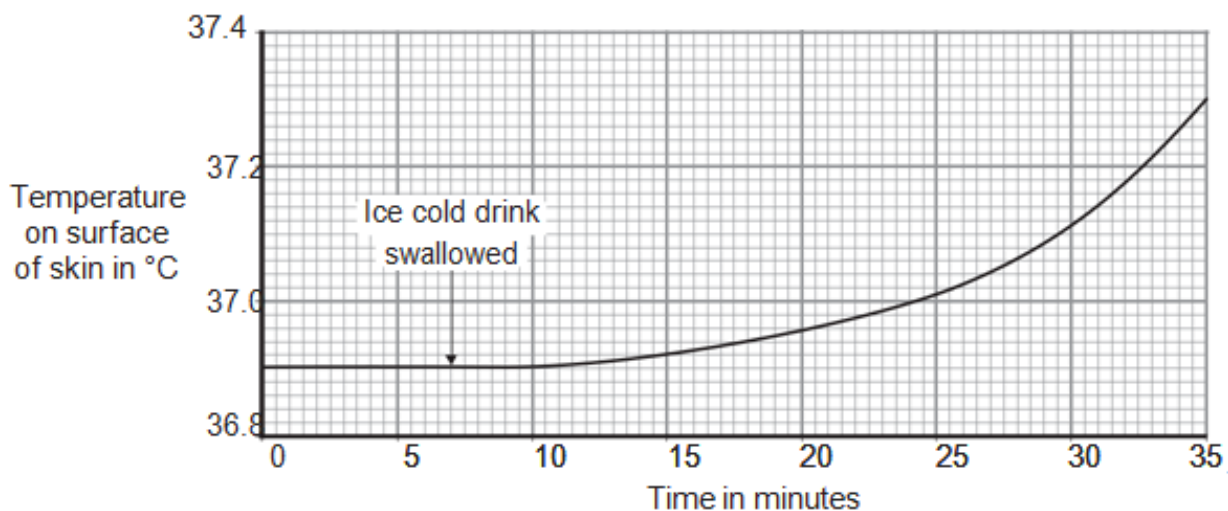
(1 mark)

A man sat in a room where the temperature was maintained at 40 °C.

The temperature on the surface of his skin was monitored for 35 minutes.

He swallowed an ice cold drink at the time indicated on the graph.

Temperature on surface of skin in °C



(b) The sweat glands contribute to the change in the temperature on the surface of the skin shown on the graph.

Explain how.

(2 marks)

(c) The blood vessels near the surface of the skin also contribute to the changes in skin temperature shown on the graph.

(c) (i) How do the blood vessels in the skin change when the core body temperature falls?

(1 mark)

(c) (ii) How does this change in the blood vessels explain the change in the skin temperature shown on the graph?

(1 mark)

Q:2 A walker falls through thin ice into very cold water.



The walker's core body temperature falls. He may die of hypothermia (when core body temperature falls too low).

(a) (i) Which part of the brain monitors the fall in core body temperature?

(1 mark)

(a) (ii) How does this part of the brain detect the fall in core body temperature?

(2 marks)

(b) While in the water the walker begins to shiver.

Shivering helps to stop the core body temperature falling too quickly.

Explain how.

(2 marks)

(c) The walker had been drinking alcohol.

Alcohol causes changes to the blood vessels supplying the skin capillaries, making the skin look red.

(c) (i) Describe the change to the blood vessels.

(1 mark)

(c) (ii) The walker is much more likely to die of hypothermia than someone who has not been drinking alcohol.

Explain why.

(2 marks)

Q:3 Water can be lost from the body in several ways.

The table shows the volume of water lost by a man on a cold day.

Way in which water is lost	Volume of water lost in cm ³
In urine	2000
Through skin	600
Breathed out	300
In faeces	100
Total	3000

(a) Calculate the proportion of water that the man lost through his skin. Show clearly how you work out your answer.

Proportion = _____

(2 marks)

(b) More water is lost through the skin on a hot day than on a cold day.

(b)(i) Explain why.

(1 mark)

(b) (ii) To maintain water balance in the body, the total volume of water taken in must equal the total volume of water lost.

Give two ways this is achieved on a hot day, when compared to a cold day.

Tick () two boxes.

The volume of water in the urine decreases.

The volume of water in the faeces increases.

The volume of water taken as food or drink increases.

The volume of water breathed out decreases.

(2 marks)

(c) Use words from the box to complete the sentences.

bladder	kidney	liver	stomach
---------	--------	-------	---------

The body cannot store amino acids.

The body converts the amino acids it cannot use into urea.

(c)(i) Urea is made in the _____

(1 mark)

(c)(ii) Urea is removed from the blood by the _____

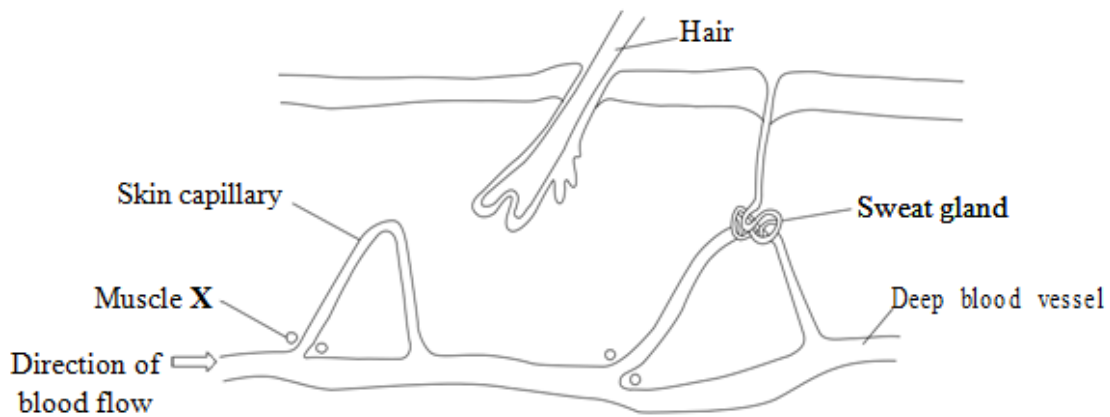
(1 mark)

(c)(iii) Urine is stored in the _____

(1 mark)

Q:4 The diagram shows a section through part of the skin.

The muscle labelled X controls the flow of blood into the skin capillary. When muscle X contracts, the flow of blood into the skin capillary is reduced.



Explain the role of muscle X in the control of body temperature.

(3 marks)

TOTAL MARKS=26