AQA - The human nervous system – GCSE Combined Science Biology

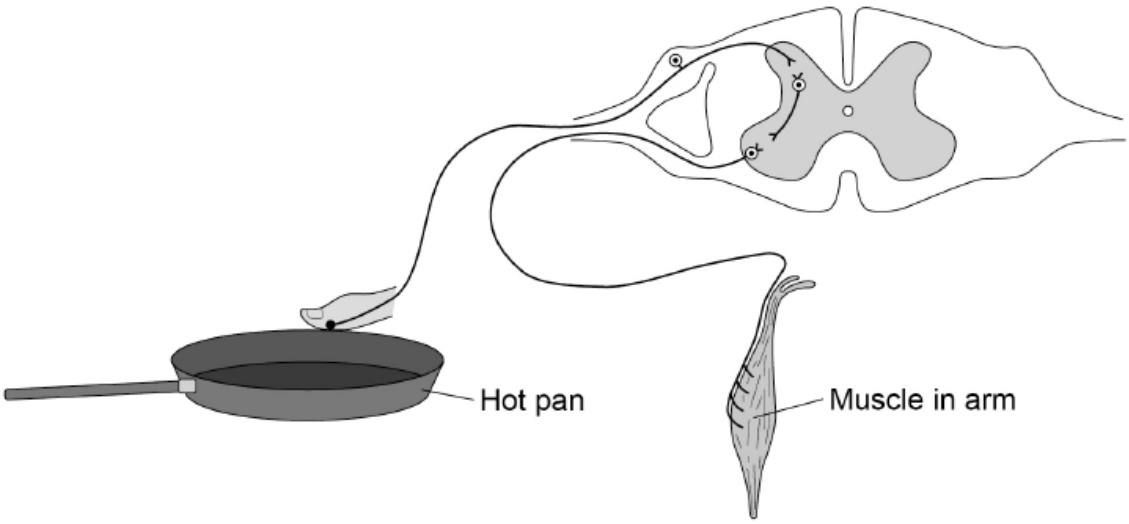
1. May/2020/Paper_2F/No.7

0 7 Human reactions are a response to an external change.

0 7 . 1 Reflex actions help to protect the body against damage.

Figure 8 shows the nervous pathway for a reflex action.

Figure 8



A stimulus from the hot pan will cause the muscle in the arm to contract and move the finger away.

Describe how the stimulus from the hot pan reaches the muscle in the arm.

[4 marks]

0 7 . 2 A student investigated whether using the right hand or the left hand had an effect on reaction time.

The student only tested right-handed people.

Describe a method for the student's investigation.

Include details of the test you would use for reaction time.

[4 marks]

A different student carried out an investigation to see if playing tennis improved reaction time.

The student used two groups of six people.

Table 2 shows the results.

Table 2

Person	Reaction time in seconds	
	People who play tennis	People who do not play tennis
1	0.2	0.3
2	0.4	0.4
3	0.3	0.6
4	0.4	0.5
5	0.2	0.3
6	0.3	0.2
Mean	**X**	0.4

0 7 . 3 Calculate mean value **X** in **Table 2**.

[2 marks]

X = _____ seconds

0 7 . 4 What is the dependent variable in the student's investigation?

[1 mark]

The student concluded:

'Playing tennis improves reaction time.'

0 7 . 5 Give **one** piece of evidence which supports the conclusion.

[1 mark]

0 7 . 6 Give **one** piece of evidence which does **not** support the conclusion.

[1 mark]

2. June/2019/Paper_2F/No.1

0 1 Conditions inside the human body are controlled.

0 1 . 1 What is the control of conditions inside the body called?

[1 mark]

Tick (✓) **one** box.

- Excretion ☐
- Fertilisation ☐
- Homeostasis ☐
- Osmosis ☐

0 1 . 2 What are the **two** ways information is sent to control body conditions?

[2 marks]

Tick (✓) **two** boxes.

- By antigens ☐
- By hormones ☐
- By muscles ☐
- By nerve impulses ☐
- By red blood cells ☐

0 1 . 3 One condition in the body that needs to be controlled is the level of water.

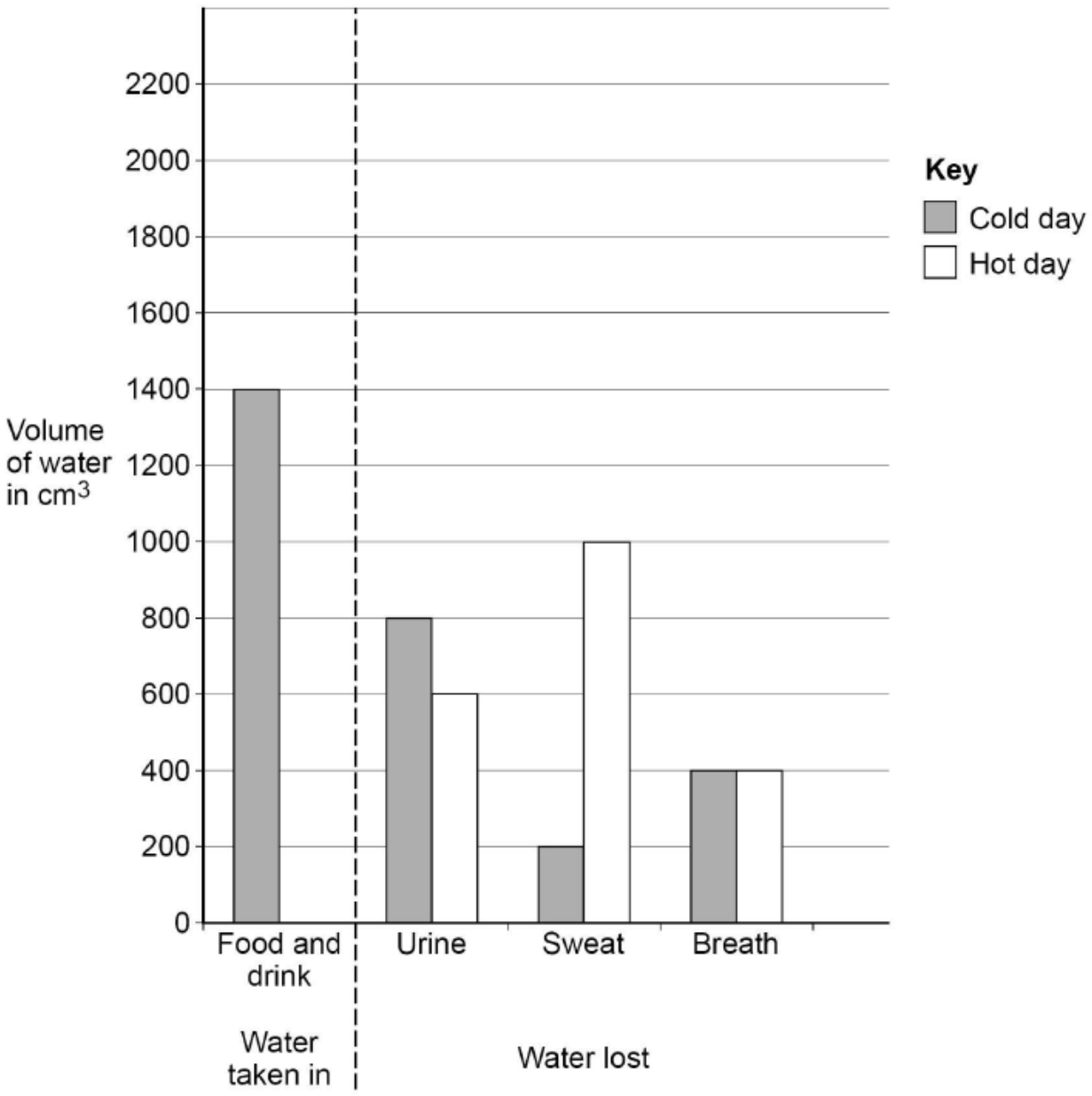
Give **one** other condition in the human body that needs to be controlled.

[1 mark]

Figure 1 shows the volumes of water taken in and lost by one person.

The volume for water taken in on a hot day has **not** been plotted on the bar graph.

Figure 1



0 1 . 4 The person lost 1400 cm^3 of water on the cold day.

How much extra water did they lose on the hot day?

[2 marks]

Extra volume of water lost = _____ cm^3

0 1 . 5 Explain why the volume of water lost on a hot day is higher than on a cold day.

[2 marks]

0 1 . 6 A boy drank 750 cm^3 of water.

His total intake of water for that day was 3000 cm^3

Calculate the percentage of the boy's total intake that the 750 cm^3 represents.

[2 marks]

Percentage = _____ %

3. June/2019/Paper_2H/No.1

0 1 Some students investigated the effect of drinking caffeine on reaction time.

They used a drink containing 32.25 mg of caffeine per 100 cm^3

This is the method used.

1. Divide the students into four groups, **A**, **B**, **C** and **D**.

2. Measure and record the reaction time of each student using the ruler-drop test.

3. Students in:
   - group **A** drink 200 cm^3 of water
   - group **B** drink 200 cm^3 of the caffeine drink
   - group **C** drink 400 cm^3 of the caffeine drink
   - group **D** drink 600 cm^3 of the caffeine drink.

4. Repeat step 2 after 15 minutes.

0 1 . 1 Describe how to do the ruler-drop test.

[3 marks]

0 1 . 2 **Table 1** shows the mass of caffeine taken in by each student.

Table 1

Group	Mass of caffeine in mg
A	0
B	64.5
C	129.0
D	**X**

Calculate value **X**.

[1 mark]

X = _____ mg

0 1 . 3 Why did group **A** drink water instead of the caffeine drink?

[1 mark]

Table 2 was used to convert the results of the ruler-drop test into reaction times.

Table 2

Distance in cm	Reaction time in s
2	0.064
4	0.090
6	0.111
8	0.128
10	0.143
12	0.156
14	0.169
16	0.181
18	0.192
20	0.202
22	0.212
24	0.221
26	0.230

Distance in cm	Reaction time in s
28	0.239
30	0.247
32	0.256
34	0.263
36	0.271
38	0.278
40	0.286
42	0.293
44	0.300
46	0.306
48	0.313
50	0.319
52	0.326

0 1 . 4 Estimate the reaction time for a student who recorded a distance of 23 cm

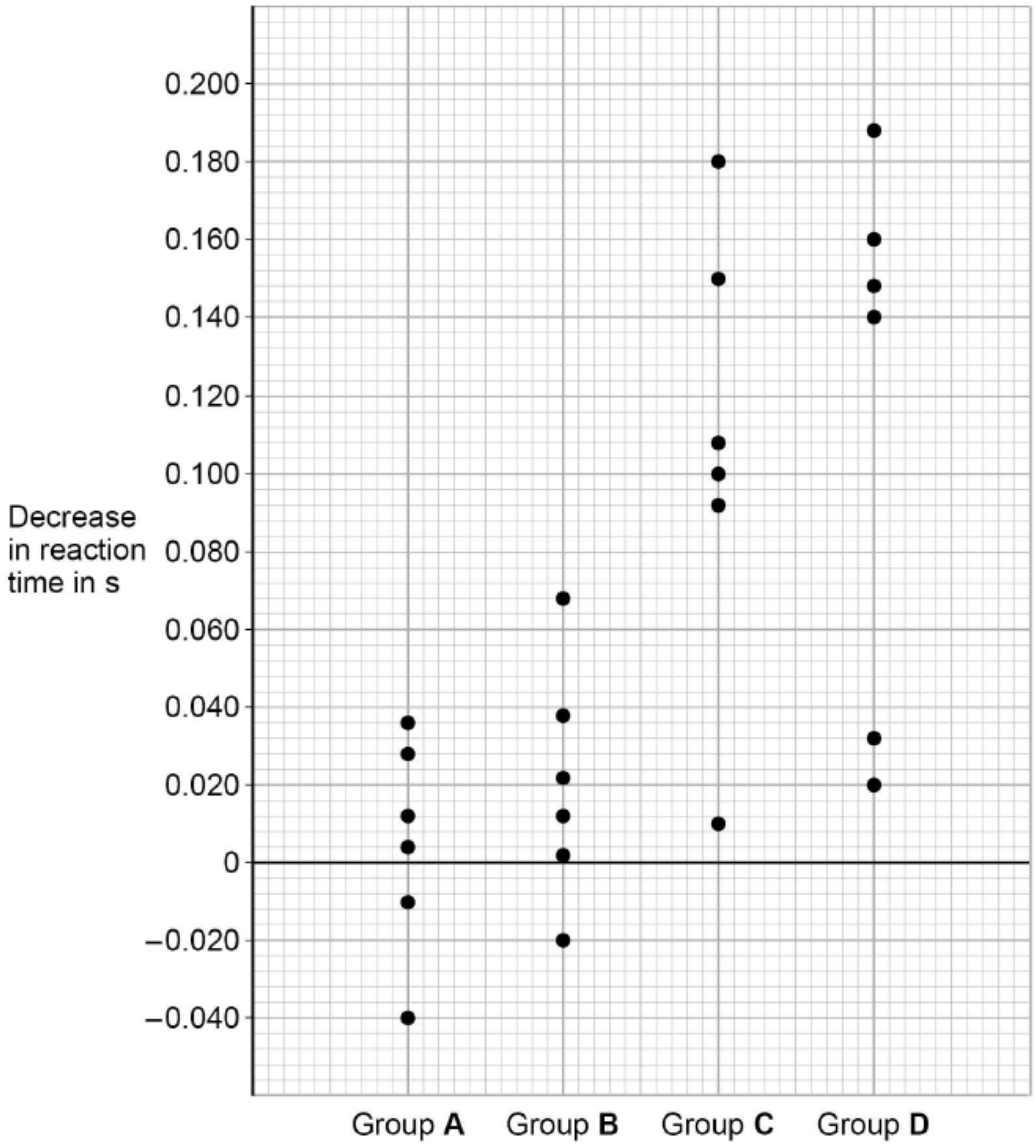
[1 mark]

Reaction time = _____ s

Students calculated the decrease in their reaction time after the drink compared with before the drink.

Figure 1 shows the results for each student.

Figure 1



0 1 . 5 Describe the effect of the mass of caffeine taken in on the decrease in reaction time.

[1 mark]

0 1 . 6 For three students the decrease in reaction time was negative.

Give the reason why the value was negative.

[1 mark]

0 1 . 7 What is the range of results for group **C**?

[1 mark]

0 1 . 8 Suggest **two** variables that should have been controlled in this investigation.

[2 marks]

1

2

0 1 . 9 Explain why the ruler-drop test does **not** involve a reflex action.

[2 marks]