Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

General Certificate of Secondary Education
Winter 2005

AQA
ASSESSMENT and QUALIFICATIONS ALLIANCE

SCIENCE: SINGLE AWARD A (MODULAR) 346013
Life and Living Processes (Module 13)

Thursday 24 November 2005 Morning Session

In addition to this paper you will require:
- a black ball-point pen;
- an answer sheet.

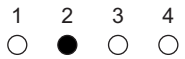
You may use a calculator.

Time allowed: 30 minutes

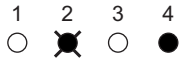
Instructions
- Fill in the boxes at the top of this page.
- Check that your name, candidate number and centre number are printed on the separate answer sheet.
- Check that the separate answer sheet has the title "Life and Living Processes" printed on it.
- Attempt **one Tier only**, **either** the Foundation Tier **or** the Higher Tier.
- Make sure that you use the correct side of the separate answer sheet; the Foundation Tier is printed on one side and the Higher Tier on the other.
- Answer **all** the questions for the Tier you are attempting.
- Record your answers on the separate answer sheet only. Rough work may be done on the question paper.

Instructions for recording answers

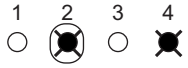
- Use a **black ball-point pen**.
- For each answer **completely fill in the circle** as shown:



- Do **not** extend beyond the circles.
- If you want to change your answer, **you must** cross out your original answer, as shown:



- If you change your mind about an answer you have crossed out and now want to choose it, draw a ring around the cross as shown:



Information
- The maximum mark for this paper is 36.

Advice
- Do **not** choose more responses than you are asked to. You will lose marks if you do.
- Make sure that you hand in both your answer sheet and this question paper at the end of the test.
- If you start to answer on the wrong side of the answer sheet by mistake, make sure that you cross out **completely** the work that is not to be marked.

You must do **one Tier** only, **either** the Foundation Tier **or** the Higher Tier.

The Higher Tier starts on page 14 of this booklet.

FOUNDATION TIER

SECTION A

Questions **ONE** to **FIVE**.

In these questions match the words in the list with the numbers.

Use **each** answer only **once**.

Mark your choices on the answer sheet.

QUESTION ONE

The drawing shows a human head and face.

The human head has organs which contain receptors.

Match words from the list with the labels **1–4** on the drawing.

contains light receptors

contains receptors sensitive to smells

contains sound receptors

contains temperature receptors

QUESTION TWO

The diagram shows a nerve cell from the skin.

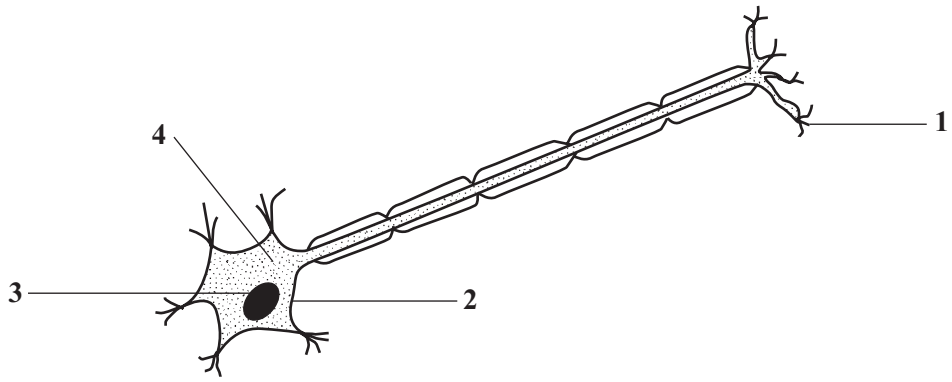
Match words from the list with the labels **1–4** on the diagram.

allows substances into the cell

cytoplasm

nucleus

passes information to other cells



TURN OVER FOR THE NEXT QUESTION

QUESTION THREE

The diagram shows parts of the digestive system.

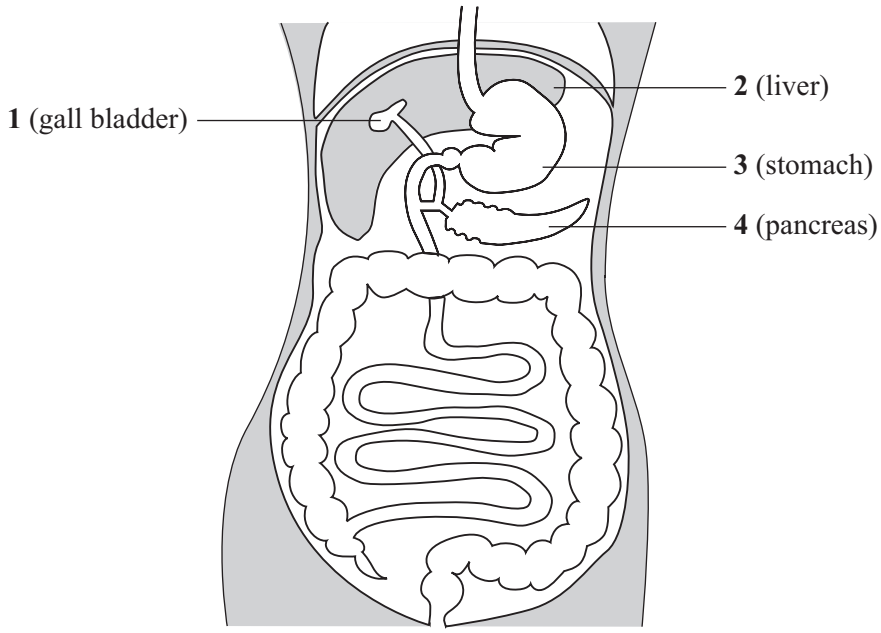
Match words from the list with the labels **1–4** on the diagram.

makes bile

makes lipase

provides acid conditions

stores bile



QUESTION FOUR

The diagram shows a person who has pulled their hand away after touching a hot pan.

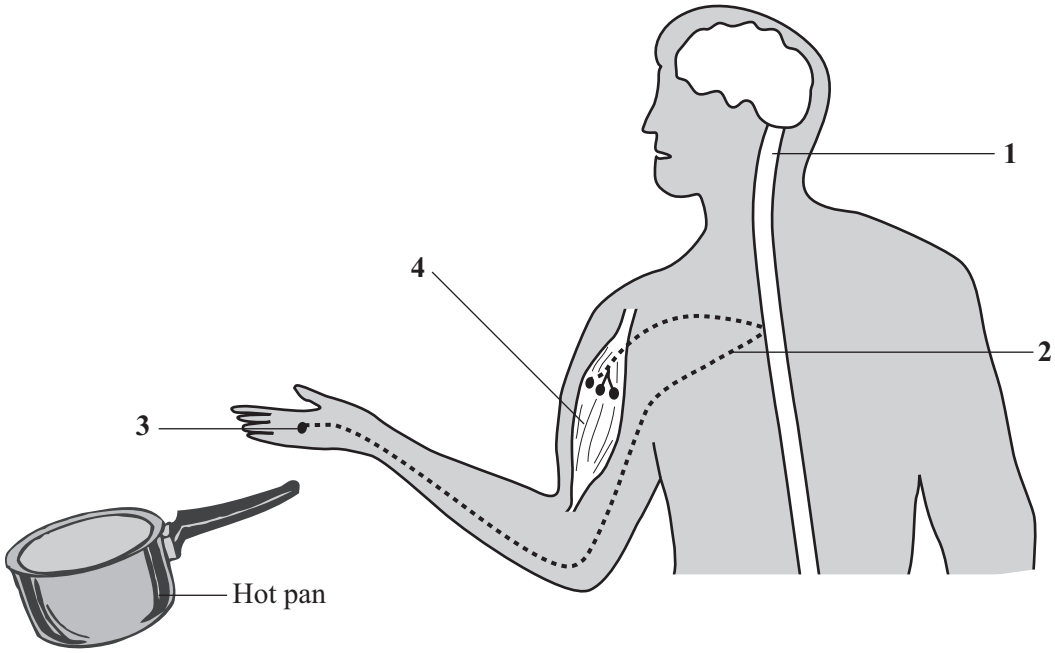
Match words from the list with the labels **1–4** on the diagram.

muscle

receptor

sensory neurone

spinal cord



TURN OVER FOR THE NEXT QUESTION

QUESTION FIVE

The diagrams show

- two organisms that cause infections
- two human cells that protect us against infections.

They are **not** drawn to the same scale.

Match words from the list with the diagrams **1–4**.

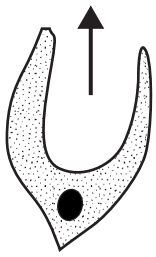
bacterium

cell from lining of a bronchus

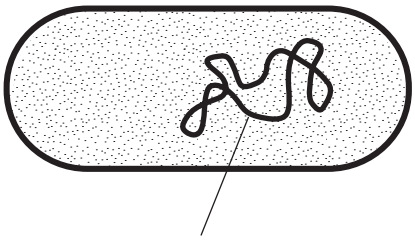
cell that ingests microorganisms

virus

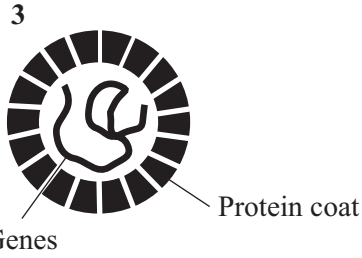
1 Mucus



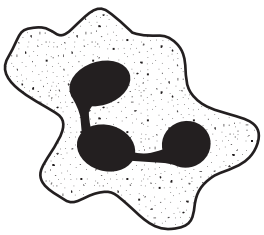
2



3



4



SECTION B

Questions **SIX** and **SEVEN**.

In these questions choose the best **two** answers.

Do **not** choose more than two.

Mark your choices on the answer sheet.

QUESTION SIX

Humans produce substances in their bodies.

Which **two** of the following are waste substances produced by the human body?

alcohol

amino acids

carbon dioxide

sugar (glucose)

urea

QUESTION SEVEN

This question is about how the body defends itself against bacteria.

Which **two** of the following stop bacteria from entering the body?

antitoxins

mucus

red blood cells

skin

white blood cells

SECTION C

Questions **EIGHT** to **TEN**.

Each of these questions has four parts.

In each part choose only **one** answer.

Mark your choices on the answer sheet.

QUESTION EIGHT

An investigation was carried out to find the effect on a person's skin temperature of going from a warm room at 20 °C to a cold room at 8 °C.

Readings were taken for five minutes.

The results are shown in the table.

Time from entering the cold room in minutes	0	1	2	3	4	5
Skin temperature in °C	29.8	29.2	28.4	27.8	27.1	26.6

8.1 The person's blood temperature was 36.9 °C.

What was the difference between their blood temperature and their skin temperature on first entering the room?

A 6.1 °C

B 7.1 °C

C 7.7 °C

D 8.1 °C

8.2 What effect did the cold conditions have on the skin temperature?

A A decrease of 0.8 °C every minute

B An average decrease of 0.9 °C per minute

C An overall decrease of 2.2 °C

D An overall decrease of 3.2 °C

8.3 In which time period did the skin temperature drop the most?

A 0 – 1 minutes

B 1 – 2 minutes

C 2 – 3 minutes

D 4 – 5 minutes

8.4 What other effect would the cold room have on the person during this investigation?

A Less water would be lost in urine

B Sweat production would fall

C Sweat production would rise and then fall

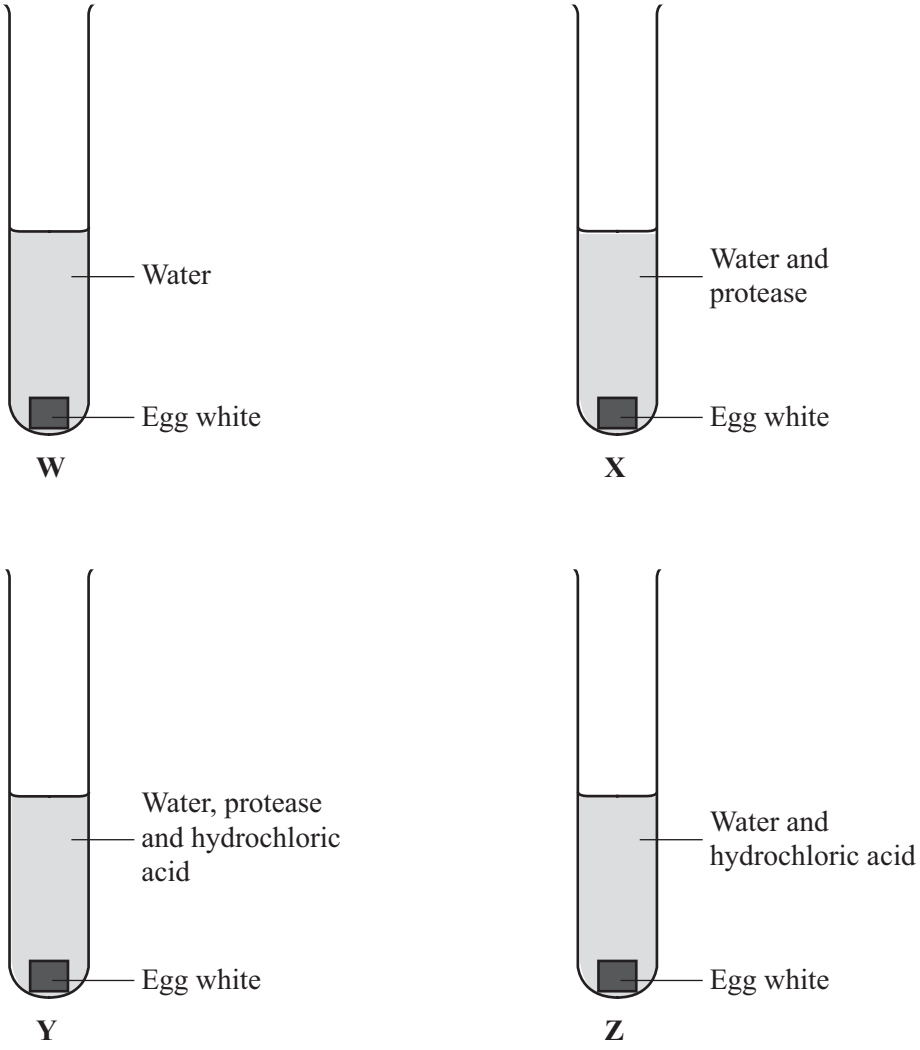
D The person would get thirsty

TURN OVER FOR THE NEXT QUESTION

QUESTION NINE

The test tubes below were set up in an investigation into the rate of protein digestion by protease from the stomach. The protein used was 2.00 grams of hard boiled egg white in each test tube.

All the test tubes were kept at 37 °C for 30 minutes.



9.1 In which test tube would most protein be digested?

A **W**

B **X**

C **Y**

D **Z**

9.2 The protein is digested into . . . . .

A amino acids.

B fatty acids.

C glycerol.

D sugar.

9.3 After 30 minutes, 1.76 grams of egg white remained in one test tube.

How much egg white had been digested?

A 0.24 grams

B 0.25 grams

C 0.34 grams

D 0.76 grams

9.4 Which other organ produces protease?

A Gullet

B Liver

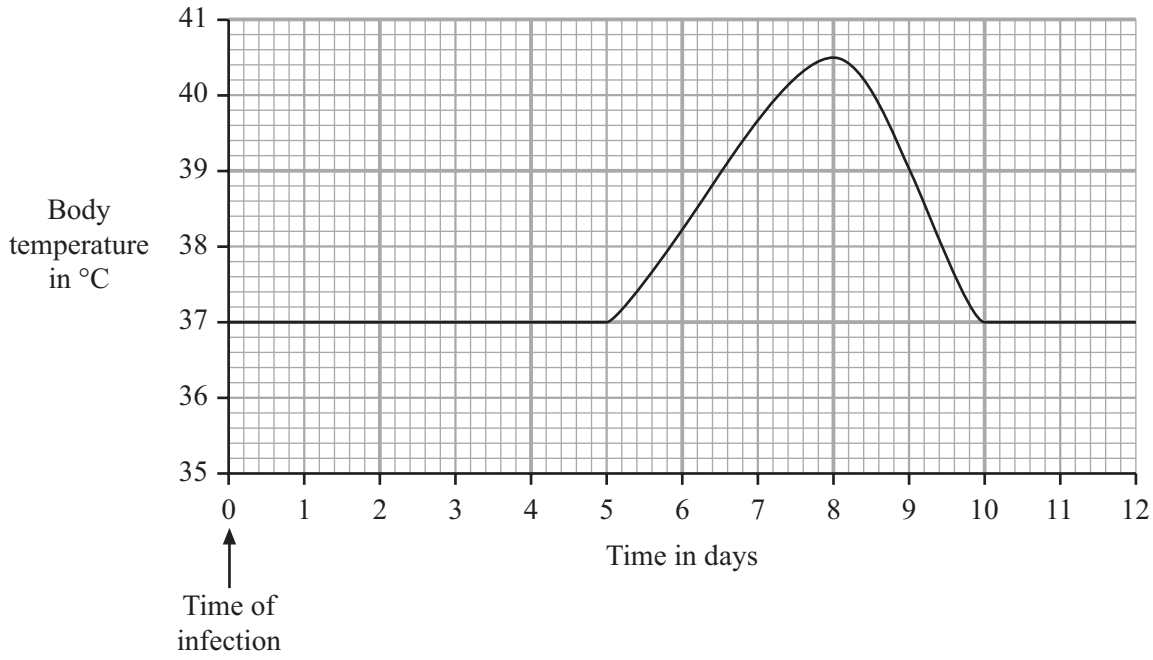
C Salivary glands

D Small intestine

TURN OVER FOR THE NEXT QUESTION

QUESTION TEN

The graph shows the body temperature of a person suffering from a disease.



10.1 The highest body temperature reached was . . . . .

A 37.0 °C

B 38.0 °C

C 40.5 °C

D 40.7 °C

10.2 For how long was the body temperature above normal?

A 2 days

B 5 days

C 8 days

D 10 days

10.3 When toxins are produced by a bacterial infection, the body temperature rises.

Between which times are the greatest number of bacteria likely to be reproducing?

A 0 – 4 days

B 5 – 8 days

C 8 – 10 days

D 10 – 12 days

10.4 When people are vaccinated, they are injected with . . . . .

A dead or weakened microorganisms.

B drugs to destroy the microorganisms.

C microorganisms to destroy toxins.

D white blood cells.

END OF TEST

You must do **one Tier** only, **either** the Foundation Tier **or** the Higher Tier.

The Foundation Tier is earlier in this booklet.

HIGHER TIER

SECTION A

Questions **ONE** and **TWO**.

In these questions match the words in the list with the numbers.

Use **each** answer only **once**.

Mark your choices on the answer sheet.

QUESTION ONE

The diagrams show

- two organisms that cause infections
- two human cells that protect us against infections.

They are **not** drawn to the same scale.

Match words from the list with the diagrams **1–4**.

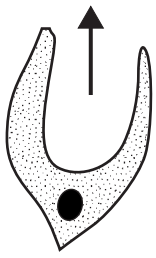
bacterium

cell from lining of a bronchus

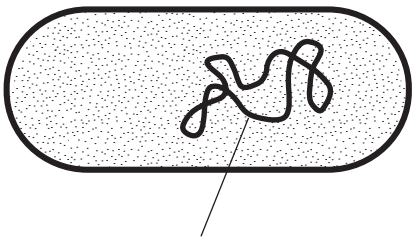
cell that ingests microorganisms

virus

1 Mucus

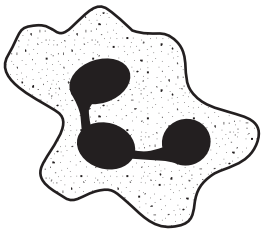


2



3

4



QUESTION TWO

The eye can see near and distant objects.

Match words from the list with the numbers **1–4** in the sentences.

change shape

contract

focus

slacken

When you want to see a near object clearly, your eye must . . . . . **1** . . . . . .

To do this, the ciliary muscles . . . . . **2** . . . . . .

This makes the suspensory ligaments . . . . . **3** . . . . . , allowing the lens to . . . . . **4** . . . . . .

TURN OVER FOR THE NEXT QUESTION

SECTION B

Questions **THREE** and **FOUR**.

In these questions choose the best **two** answers.

Do **not** choose more than two.

Mark your choices on the answer sheet.

QUESTION THREE

This question is about how the body defends itself against bacteria.

Which **two** of the following stop bacteria from entering the body?

antitoxins

mucus

red blood cells

skin

white blood cells

QUESTION FOUR

This question is about parts of the digestive system.

Which **two** of these parts do **not** produce digestive enzymes?

large intestine

liver

pancreas

salivary glands

small intestine

NO QUESTIONS APPEAR ON THIS PAGE

TURN OVER FOR THE NEXT QUESTION

SECTION C

Questions **FIVE** to **TEN**.

Each of these questions has four parts.

In each part choose only **one** answer.

Mark your choices on the answer sheet.

QUESTION FIVE

An investigation was carried out to find the effect on a person's skin temperature of going from a warm room at 20 °C to a cold room at 8 °C.

Readings were taken for five minutes.

The results are shown in the table.

Time from entering the cold room in minutes	0	1	2	3	4	5
Skin temperature in °C	29.8	29.2	28.4	27.8	27.1	26.6

5.1 The person's blood temperature was 36.9 °C.

What was the difference between their blood temperature and their skin temperature on first entering the room?

A 6.1 °C

B 7.1 °C

C 7.7 °C

D 8.1 °C

5.2 What effect did the cold conditions have on the skin temperature?

A A decrease of 0.8 °C every minute

B An average decrease of 0.9 °C per minute

C An overall decrease of 2.2 °C

D An overall decrease of 3.2 °C

5.3 In which time period did the skin temperature drop the most?

A 0 – 1 minutes

B 1 – 2 minutes

C 2 – 3 minutes

D 4 – 5 minutes

5.4 What other effect would the cold room have on the person during this investigation?

A Less water would be lost in urine

B Sweat production would fall

C Sweat production would rise and then fall

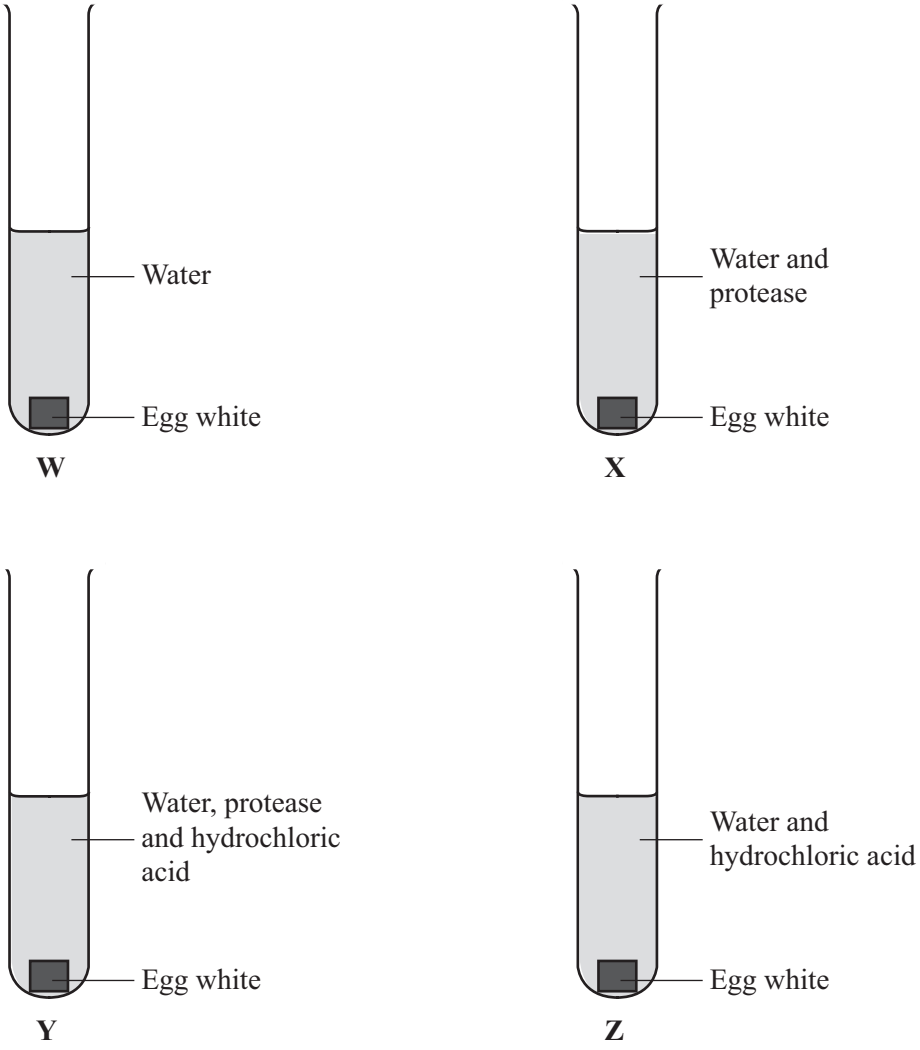
D The person would get thirsty

TURN OVER FOR THE NEXT QUESTION

QUESTION SIX

The test tubes below were set up in an investigation into the rate of protein digestion by protease from the stomach. The protein used was 2.00 grams of hard boiled egg white in each test tube.

All the test tubes were kept at 37 °C for 30 minutes.



6.1 In which test tube would most protein be digested?

A **W**

B **X**

C **Y**

D **Z**

6.2 The protein is digested into . . . . .

A amino acids.

B fatty acids.

C glycerol.

D sugar.

6.3 After 30 minutes, 1.76 grams of egg white remained in one test tube.

How much egg white had been digested?

A 0.24 grams

B 0.25 grams

C 0.34 grams

D 0.76 grams

6.4 Which other organ produces protease?

A Gullet

B Liver

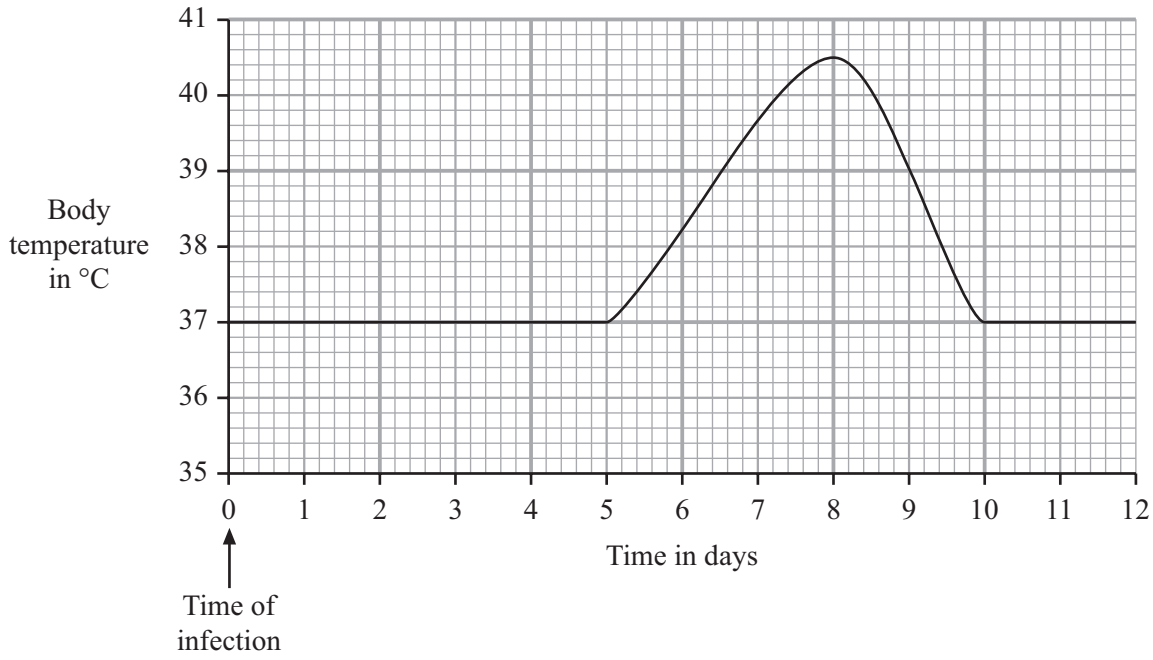
C Salivary glands

D Small intestine

TURN OVER FOR THE NEXT QUESTION

QUESTION SEVEN

The graph shows the body temperature of a person suffering from a disease.



7.1 The highest body temperature reached was . . . . .

A 37.0 °C

B 38.0 °C

C 40.5 °C

D 40.7 °C

7.2 For how long was the body temperature above normal?

A 2 days

B 5 days

C 8 days

D 10 days

7.3 When toxins are produced by a bacterial infection, the body temperature rises.

Between which times are the greatest number of bacteria likely to be reproducing?

A 0 – 4 days

B 5 – 8 days

C 8 – 10 days

D 10 – 12 days

7.4 When people are vaccinated, they are injected with . . . . .

A dead or weakened microorganisms.

B drugs to destroy the microorganisms.

C microorganisms to destroy toxins.

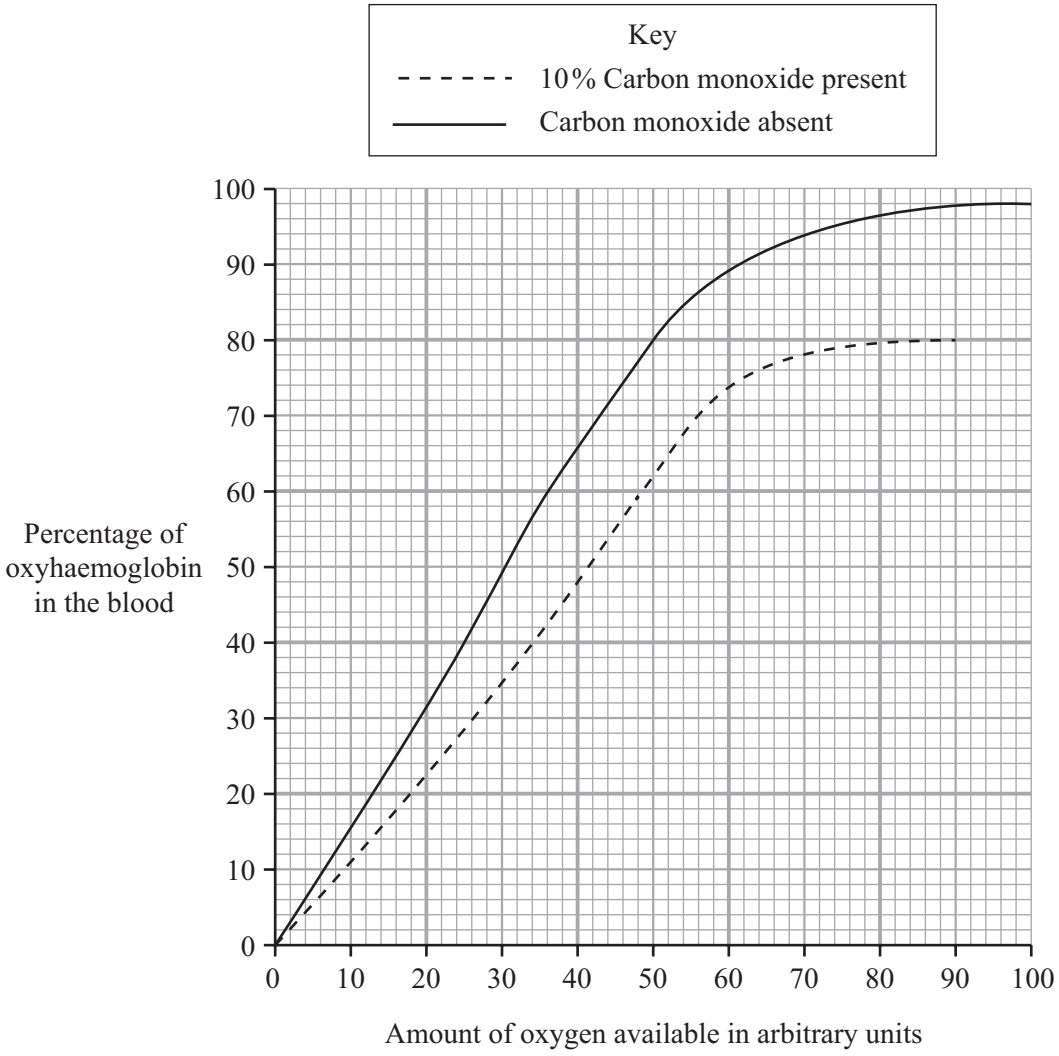
D white blood cells.

TURN OVER FOR THE NEXT QUESTION

QUESTION EIGHT

Haemoglobin combines with oxygen in the blood to form oxyhaemoglobin. The amount of oxyhaemoglobin formed is affected by the amount of oxygen available. It is also affected by the presence of other gases such as carbon monoxide.

The graph shows the percentage of oxyhaemoglobin in the blood when different amounts of oxygen are available. The two lines show the percentages of oxyhaemoglobin in the blood when 10 % carbon monoxide is present and when carbon monoxide is absent.



8.1 What is the percentage of oxyhaemoglobin in the blood when 10 % carbon monoxide is present and 40 arbitrary units of oxygen are available?

A 26 %

B 34 %

C 48 %

D 66 %

8.2 What happens to the amount of oxyhaemoglobin in the blood when 50 arbitrary units of oxygen are available and 10 % carbon monoxide is present in the blood?

A It falls by 8 units

B It falls from 80 % to 62 %

C It rises from 62 units to 80 units

D It rises from 50 % to 80 %

8.3 Oxyhaemoglobin is formed in the . . . . .

A digestive system.

B kidneys.

C liver.

D lungs.

8.4 Carbon monoxide combined with haemoglobin forms carboxyhaemoglobin. This does not break down easily.

What is the likely effect on the body of the formation of carboxyhaemoglobin?

A Less oxygen passes from the blood into the cells

B Platelets are unable to help clot blood

C The nuclei in white blood cells are destroyed

D The plasma would carry more carbon dioxide

TURN OVER FOR THE NEXT QUESTION

QUESTION NINE

Water is lost from the body in several ways.
The volume of water lost varies with the activity of the person.
The table shows the water loss from the body of an athlete when he is 'not in training' and when he is 'in training'.

	Water loss in cm^3 per day	
Source of water loss	**when not in training**	**when in training**
Urine	1400	500
Skin	500	5300
Faeces	200	200
Lungs	400	550

9.1 The increase in water loss per day as a result of training is . . . . .

A 2500 cm^3

B 4050 cm^3

C 4500 cm^3

D 6550 cm^3

9.2 The proportion of water lost via the athlete's skin when he is not in training is . . . . .

A $\frac{1}{53}$ (1.89 %)

B $\frac{1}{50}$ (2 %)

C $\frac{1}{25}$ (4 %)

D $\frac{1}{5}$ (20 %)

9.3 Why is more water lost from the athlete's skin when he is in training?

A It ensures that salt is released onto the skin

B It helps to maintain the correct working temperature for enzymes

C It prevents too much blood from entering the capillaries of the skin

D It removes excess water from the body

9.4 Why does the athlete produce less urine when in training?

A Faeces are moving faster through the digestive system

B More urea is produced during exercise

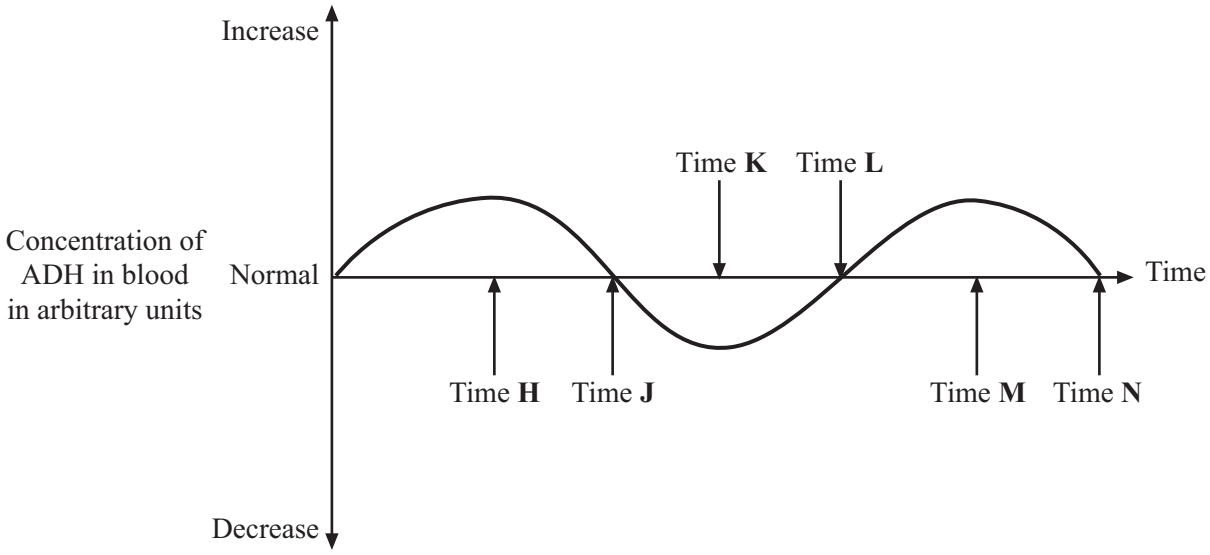
C The blood plasma of the athlete is more dilute

D The water lost through the skin has not been replaced quickly enough

TURN OVER FOR THE NEXT QUESTION

QUESTION TEN

The graph shows changes in the concentration of ADH in the blood of a person during part of a day.



10.1 When is the person producing the most dilute urine?

A At time **H**

B At time **K**

C At time **L**

D At time **N**

10.2 When was the person likely to be losing most water through sweating?

A From time **H** to **K**

B From time **J** to **L**

C From time **K** to **M**

D From time **L** to **N**

10.3 Which of the following are true of ADH?

	Produced by the	**Has its effect on the . . . . .**
A	kidney	bladder
B	liver	kidney
C	pituitary gland	brain
D	pituitary gland	kidney

10.4 What effect does ADH have in the body?

A Increases the reabsorption of sugar

B Maintains the oxygen content of the blood

C Reduces the ion content of the blood

D Regulates the water content of the blood

END OF TEST

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE