Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

General Certificate of Secondary Education
June 2005

ASSESSMENT and QUALIFICATIONS ALLIANCE

SCIENCE: DOUBLE AWARD A (MODULAR) 346001
BIOLOGY A (MODULAR)
Humans as Organisms (Module 01)

Tuesday 28 June 2005 Morning Session

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

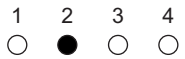
You may use a calculator.

Time allowed: 30 minutes

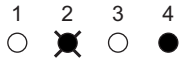
Instructions
- Fill in the boxes at the top of this page.
- Check that your name, candidate number and centre number are printed on the separate answer sheet.
- Check that the separate answer sheet has the title "Humans as Organisms" printed on it.
- Attempt **one Tier only**, **either** the Foundation 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

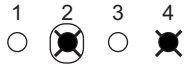
- Use a **black ball-point pen**.
- For each answer **completely fill in the circle** as shown:



- 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 diagram shows part of the digestive system.

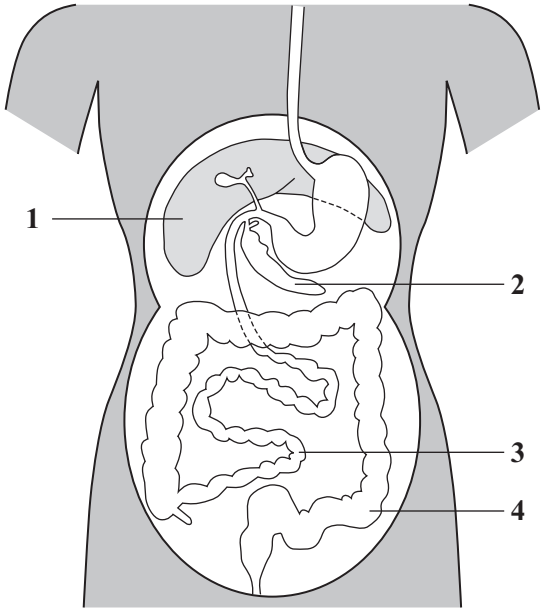
Match words from the list with the labels **1–4** on the diagram.

large intestine

liver

pancreas

small intestine



QUESTION TWO

The drawing shows a group of cells from the human female reproductive system. These cells move the egg towards the womb.

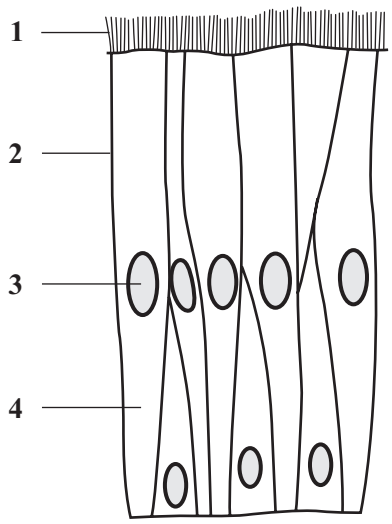
Match words from the list with the labels **1–4** on the drawing.

controls the passage of water into the cell

moves the egg

nucleus

where most chemical reactions occur



TURN OVER FOR THE NEXT QUESTION

QUESTION THREE

The table is about components of the diet.

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

fat

protein

starch

sugar

Component	Description
1	an insoluble carbohydrate
2	it is broken down into amino acids during digestion
3	one product of its digestion is glycerol
4	passes into the blood in the small intestine

QUESTION FOUR

The diagram shows some of the structures in the thorax.

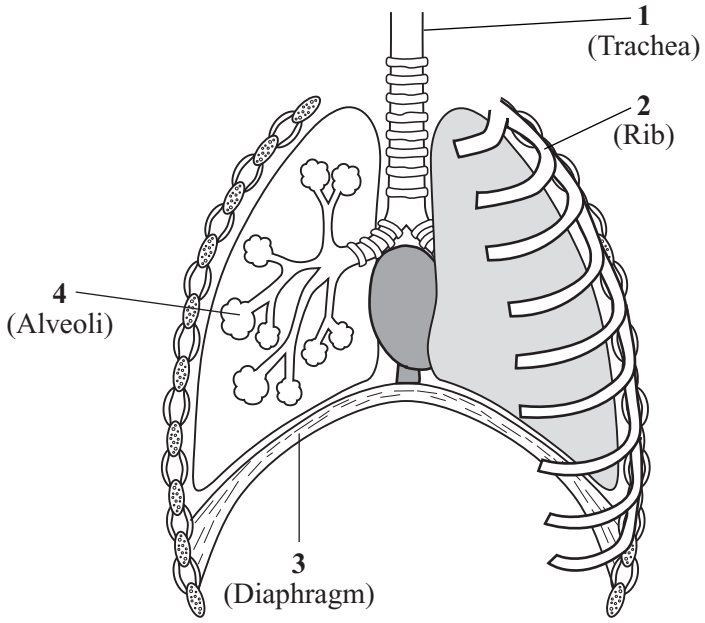
Match words from the list with the labels **1–4** on the diagram.

brings air to the lungs

becomes flatter when we breathe in

moves outwards when we breathe in

where carbon dioxide leaves the blood



TURN OVER FOR THE NEXT QUESTION

QUESTION FIVE

This question is about the functions of some structures in the body.

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

blood plasma

platelets

stomach wall

the small intestine

Structure	Function
1	absorption of soluble materials
2	blood clotting
3	production of hydrochloric acid
4	transport of carbon dioxide

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

The body is able to defend itself in several ways.

Which **two** of the following help to defend the body against microbes?

antibiotics from the white blood cells

antitoxins from the white blood cells

bile from the liver

red blood cells

the skin

QUESTION SEVEN

Which **two** of the following are features of viruses?

can reproduce outside of living cells

cell membrane

cell wall

protein coat

smaller than bacteria

SECTION C

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

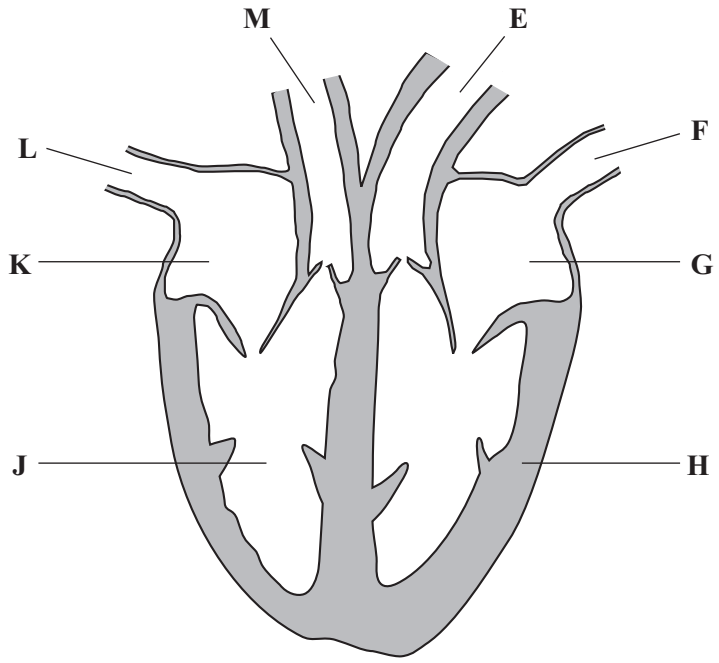
Each of these questions has four parts.

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

Mark your choices on the answer sheet.

QUESTION EIGHT

The diagram shows a section through the heart and the blood vessels attached to it.



8.1 The arteries are labelled . . . . .

A **E** and **F**

B **E** and **M**

C **F** and **L**

D **L** and **M**

8.2 Blood is pumped to the brain by part . . . . .

A **G**

B **H**

C **J**

D **K**

8.3 Blood containing a lot of oxygen would be found in . . . . .

A **E**

B **K**

C **L**

D **M**

8.4 Some babies are born with a hole joining the left atrium and the right atrium.

This may . . . . .

A cause more blood to enter the right ventricle.

B cause some blood to bypass the lungs.

C prevent some blood entering the right atrium.

D prevent the heart muscle working.

TURN OVER FOR THE NEXT QUESTION

QUESTION NINE

Our muscle cells break down glucose to release energy.

9.1 The breakdown of glucose with oxygen is called . . . . .

A aerobic respiration.

B anaerobic respiration.

C breathing.

D ventilation.

9.2 The breakdown of glucose without using oxygen is called . . . . .

A aerobic respiration.

B anaerobic respiration.

C breathing.

D ventilation.

9.3 When there is a shortage of oxygen, muscle cells produce . . . . .

A glucose.

B lactic acid.

C more heat.

D more water.

9.4 Muscles need energy to . . . . .

A break down protein.

B contract.

C get rid of carbon dioxide.

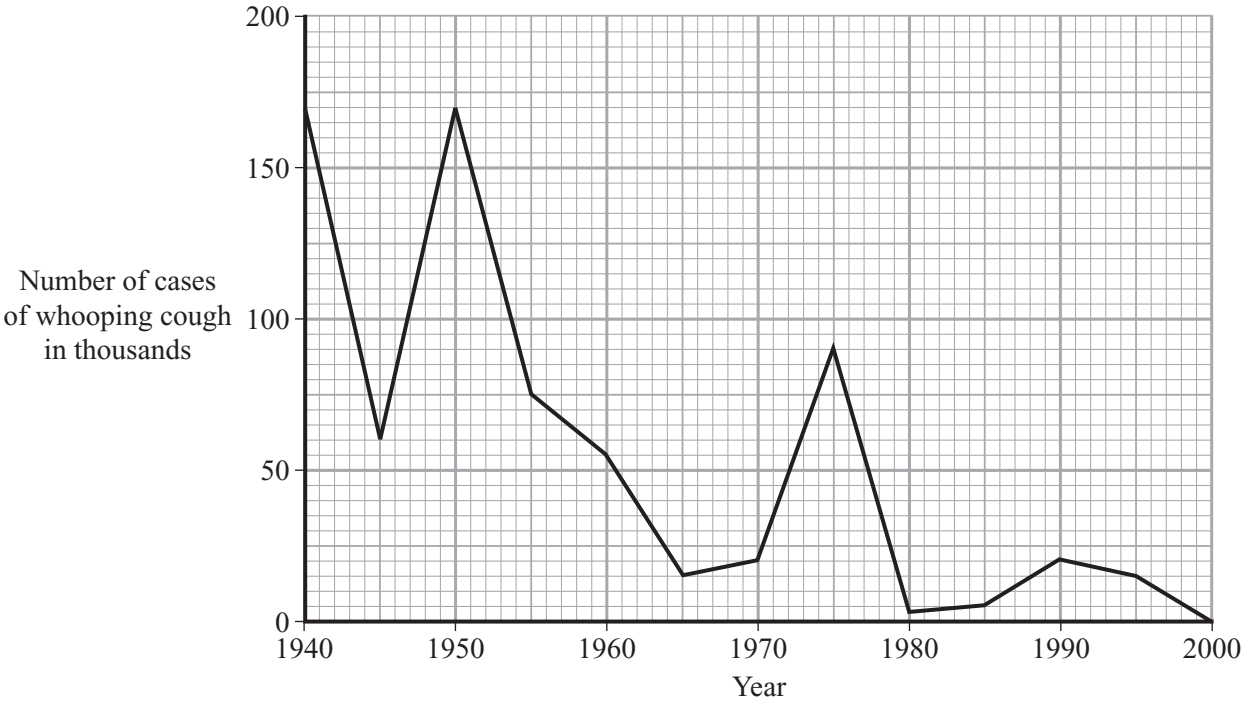
D take in oxygen.

NO QUESTIONS APPEAR ON THIS PAGE

TURN OVER FOR THE NEXT QUESTION

QUESTION TEN

The graph shows the number of cases of whooping cough between 1940 and 2000.



10.1 The largest fall in the number of cases was between . . . . .

A 1940 and 1945

B 1950 and 1955

C 1960 and 1965

D 1975 and 1980

10.2 What was the number of cases of whooping cough in 1955?

A 75

B 750

C 7 500

D 75 000

10.3 Whooping cough is caught by breathing in the bacteria which cause the disease. The breathing organs produce mucus which covers the lining of these organs.

How does the mucus help to prevent whooping cough?

A It closes the entrance to the alveoli

B It prevents the bacteria getting oxygen

C It slows down the growth of the bacteria

D It traps the bacteria and prevents them entering the lungs

10.4 How does the body respond to a vaccination?

A More platelets are produced

B More red blood cells are produced

C Platelets begin to form clots

D White blood cells produce antibodies

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

This question is about the functions of some structures in the body.

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

blood plasma

platelets

stomach wall

the small intestine

Structure	Function
1	absorption of soluble materials
2	blood clotting
3	production of hydrochloric acid
4	transport of carbon dioxide

QUESTION TWO

The digestive system produces a number of different substances.

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

amylase

bile

hydrochloric acid

lipase

Substance	Function
1	digests fats into fatty acids and glycerol
2	digests starch into sugars
3	increases the surface area of fats
4	makes the conditions in the stomach suitable for the action of protease

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

Which **two** of the following are features of viruses?

can reproduce outside of living cells

cell membrane

cell wall

protein coat

smaller than bacteria

QUESTION FOUR

Anaemia is an illness caused by too little haemoglobin in the blood.

Choose from the list the **two** possible effects of anaemia on the body.

a reduced rate of anaerobic respiration

a shortage of glucose for respiration

a shortage of oxygen in the muscles when exercising

less carbon dioxide carried in the blood

less oxygen transported by the blood

NO QUESTIONS APPEAR ON THIS PAGE

TURN OVER FOR THE NEXT QUESTION

SECTION C

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

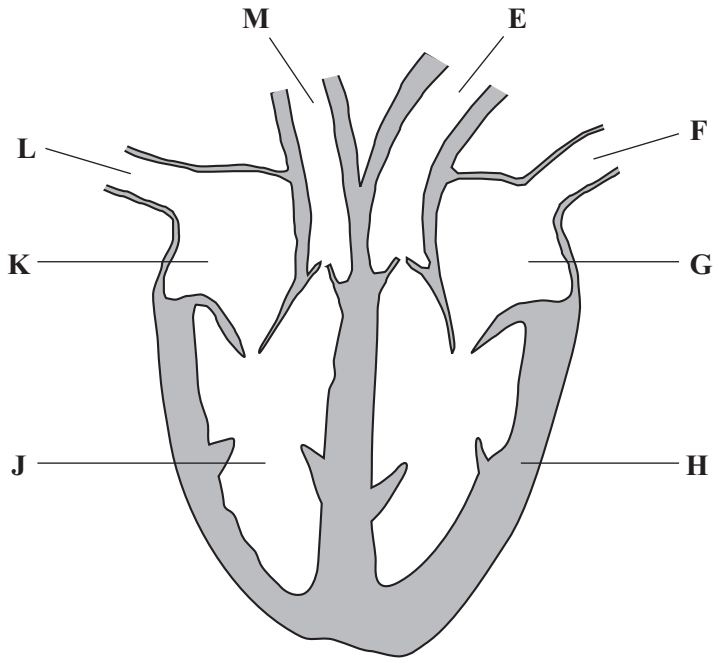
Each of these questions has four parts.

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

Mark your choices on the answer sheet.

QUESTION FIVE

The diagram shows a section through the heart and the blood vessels attached to it.



5.1 The arteries are labelled . . . . .

A **E** and **F**

B **E** and **M**

C **F** and **L**

D **L** and **M**

5.2 Blood is pumped to the brain by part . . . . .

A **G**

B **H**

C **J**

D **K**

5.3 Blood containing a lot of oxygen would be found in . . . . .

A **E**

B **K**

C **L**

D **M**

5.4 Some babies are born with a hole joining the left atrium and the right atrium.

This may . . . . .

A cause more blood to enter the right ventricle.

B cause some blood to bypass the lungs.

C prevent some blood entering the right atrium.

D prevent the heart muscle working.

TURN OVER FOR THE NEXT QUESTION

QUESTION SIX

Our muscle cells break down glucose to release energy.

6.1 The breakdown of glucose with oxygen is called . . . . .

A aerobic respiration.

B anaerobic respiration.

C breathing.

D ventilation.

6.2 The breakdown of glucose without using oxygen is called . . . . .

A aerobic respiration.

B anaerobic respiration.

C breathing.

D ventilation.

6.3 When there is a shortage of oxygen, muscle cells produce . . . . .

A glucose.

B lactic acid.

C more heat.

D more water.

6.4 Muscles need energy to . . . . .

A break down protein.

B contract.

C get rid of carbon dioxide.

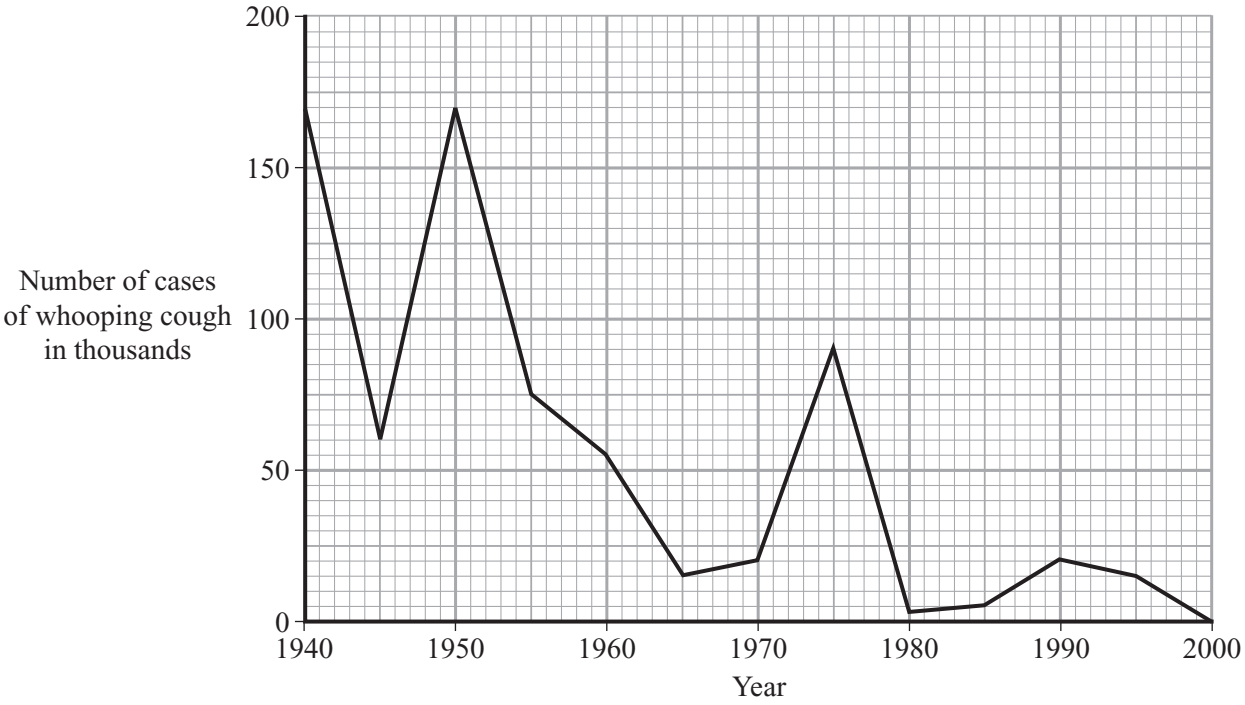
D take in oxygen.

NO QUESTIONS APPEAR ON THIS PAGE

TURN OVER FOR THE NEXT QUESTION

QUESTION SEVEN

The graph shows the number of cases of whooping cough between 1940 and 2000.



7.1 The largest fall in the number of cases was between . . . . .

A 1940 and 1945

B 1950 and 1955

C 1960 and 1965

D 1975 and 1980

7.2 What was the number of cases of whooping cough in 1955?

A 75

B 750

C 7 500

D 75 000

7.3 Whooping cough is caught by breathing in the bacteria which cause the disease. The breathing organs produce mucus which covers the lining of these organs.

How does the mucus help to prevent whooping cough?

A It closes the entrance to the alveoli

B It prevents the bacteria getting oxygen

C It slows down the growth of the bacteria

D It traps the bacteria and prevents them entering the lungs

7.4 How does the body respond to a vaccination?

A More platelets are produced

B More red blood cells are produced

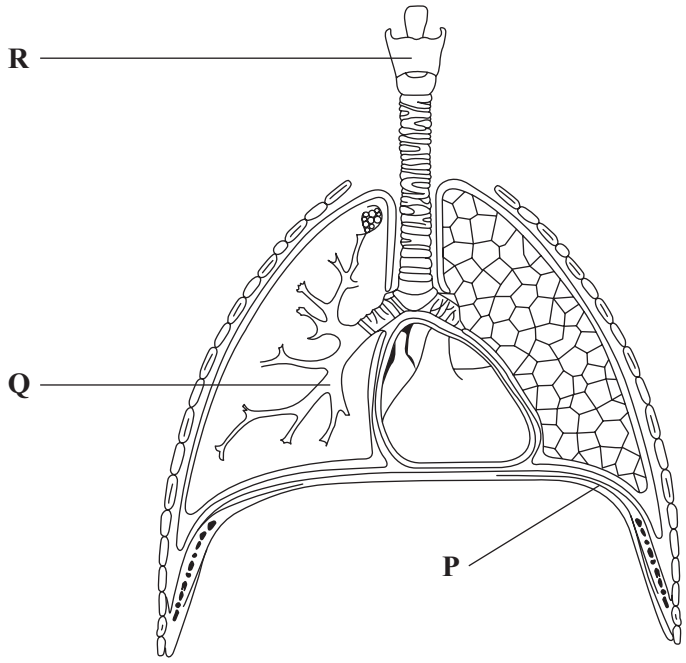
C Platelets begin to form clots

D White blood cells produce antibodies

TURN OVER FOR THE NEXT QUESTION

QUESTION EIGHT

The diagram shows a section through the thorax.



8.1 To move air into the lungs . . . . .

A carbon dioxide must first leave the lungs.

B the air pressure at **R** must be greater than atmospheric pressure.

C the diaphragm must become arched.

D the muscles at **P** must contract.

8.2 When breathing out . . . . .

A carbon dioxide fills the lungs.

B the air pressure at **Q** becomes lower than at **R**.

C the muscles at **P** relax.

D the volume of the lungs becomes larger.

8.3 Carbon dioxide moves from the blood to the alveoli because . . . . .

A there is a high concentration of carbon dioxide in the blood.

B there is a low concentration of carbon dioxide in the blood.

C there is a high concentration of oxygen in the blood.

D there is a low concentration of oxygen in the blood.

8.4 The rate of gaseous exchange in the lungs is increased by . . . . .

A the large surface area of the alveoli.

B the length of the trachea.

C the number of white cells in the blood.

D the thickness of the walls of the bronchioles.

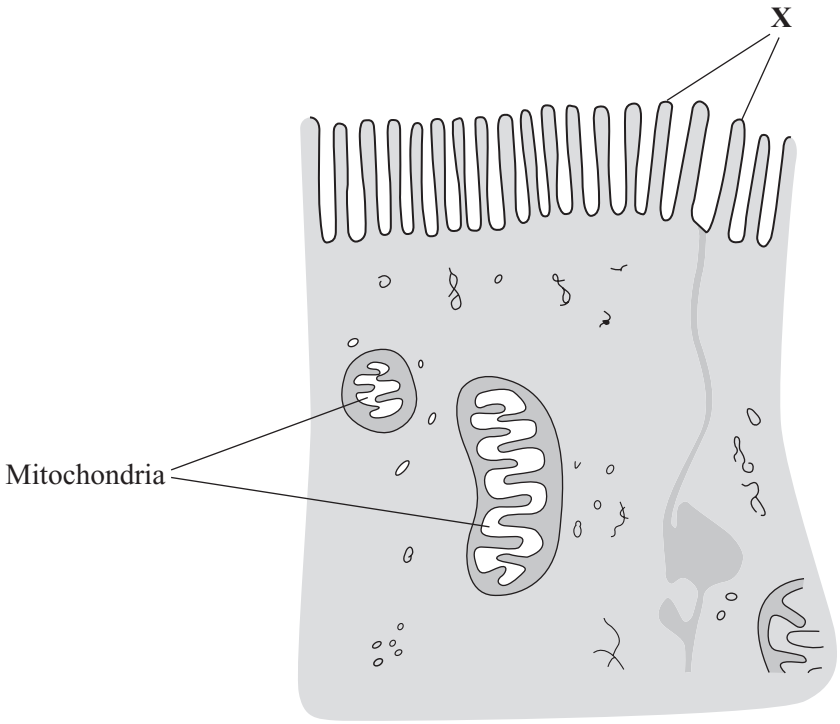
TURN OVER FOR THE NEXT QUESTION

QUESTION NINE

The diagram shows parts of a cell from the lining of the human small intestine, as seen through a very powerful microscope.

The cell absorbs soluble food from the contents of the small intestine.

The structures labelled **X** are in contact with the contents of the small intestine.



9.1 The structures labelled **X** are useful because . . . . .

A they contain blood capillaries.

B they increase the surface area of the cell.

C they produce bile.

D they trap bacteria.

9.2 The mitochondria are useful because they . . . . .

A produce digestive enzymes.

B produce mucus.

C release energy for the active transport of soluble food materials.

D release energy for the diffusion of food materials.

9.3 Soluble food passes into the cell by the process of . . . . .

A diffusion.

B digestion.

C emulsification.

D respiration.

9.4 Which of the following is a chemical reaction that is catalysed by an enzyme and takes place outside a cell?

A Anaerobic respiration

B Breakdown of protein to amino acids

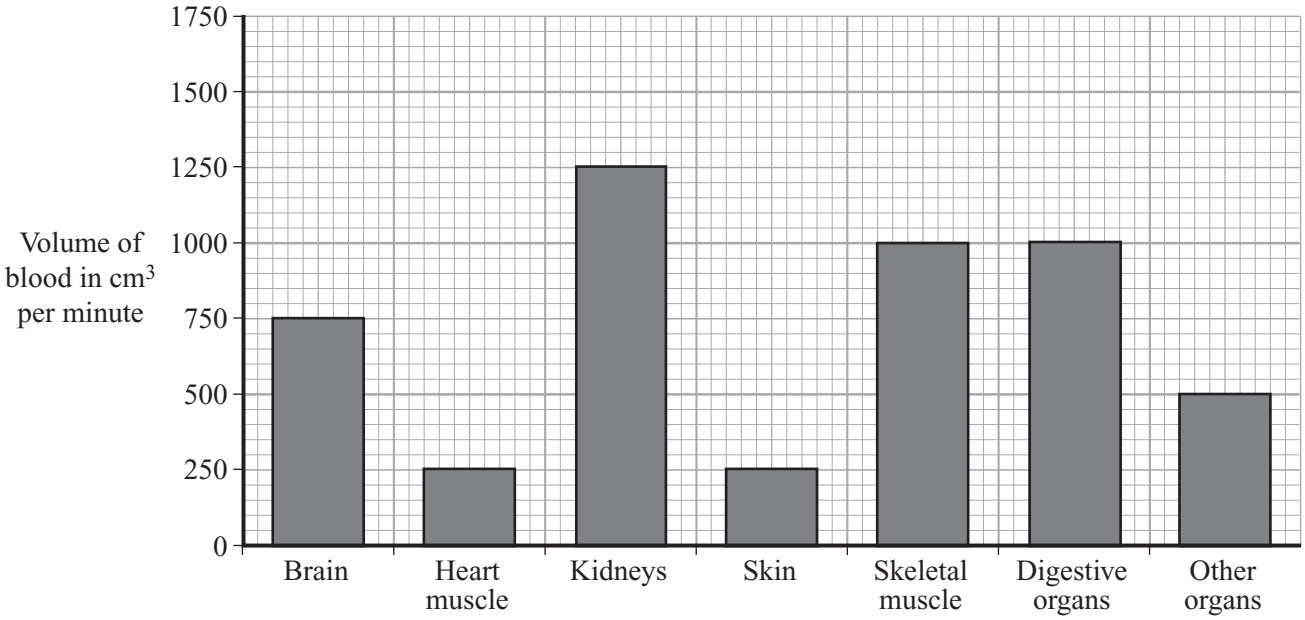
C Conversion of haemoglobin to oxyhaemoglobin

D Production of antibodies

TURN OVER FOR THE NEXT QUESTION

QUESTION TEN

The bar chart shows the volume of blood flowing to different organs when a person is at rest.



10.1 What is the total volume of blood flowing through the kidneys and skin in one hour?

A 300 cm^3

B 1 500 cm^3

C 9 000 cm^3

D 90 000 cm^3

10.2 The total volume of blood in the body is 5 000 cm^3.

How many times would the total blood volume pass through the brain in one hour?

A 6 times

B 9 times

C 12 times

D 18 times

10.3 If the person exercises, the volume of blood flowing through the heart muscle increases to 600 cm^3 per minute.
At the same time, the volume of blood flowing to the skeletal muscles increases to 5 000 cm^3 per minute.

This means that . . . . .

A the amount of blood flowing to the lungs decreases to allow more blood to flow to the muscles.

B the blood flow to some parts of the body stops until the exercise finishes.

C the heart is beating more often.

D the total amount of blood in the body has increased.

10.4 During exercise, the total volume of blood flowing to the digestive organs is reduced.

One result of this is that . . . . .

A the intestines stop making enzymes.

B the rate of absorption of soluble food decreases.

C the surface area of the small intestine decreases.

D the temperature of the stomach falls.

END OF TEST

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