Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

General Certificate of Secondary Education
Winter 2004

AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

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

Thursday 18 November 2004   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.

346001

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

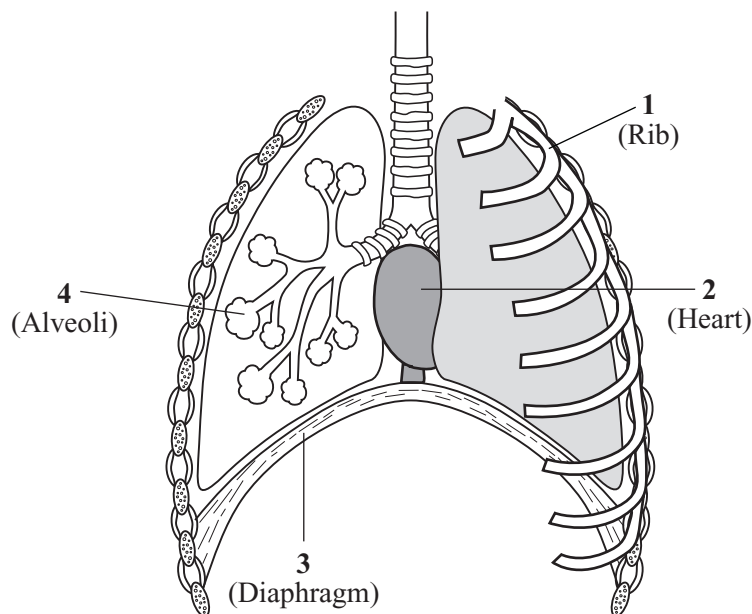The diagram shows some of the structures in the thorax.

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

protects the lungs

pumps blood around the body

separates the thorax from the abdomen

where oxygen enters the blood

QUESTION TWO

The table is about jobs done by parts of our blood.

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

plasma

platelet

red blood cell

white blood cell

Part of blood	One job that it does
1	Forms clots at wounds
2	Produces antitoxins
3	Transports most of the oxygen
4	Transports urea

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

QUESTION THREE

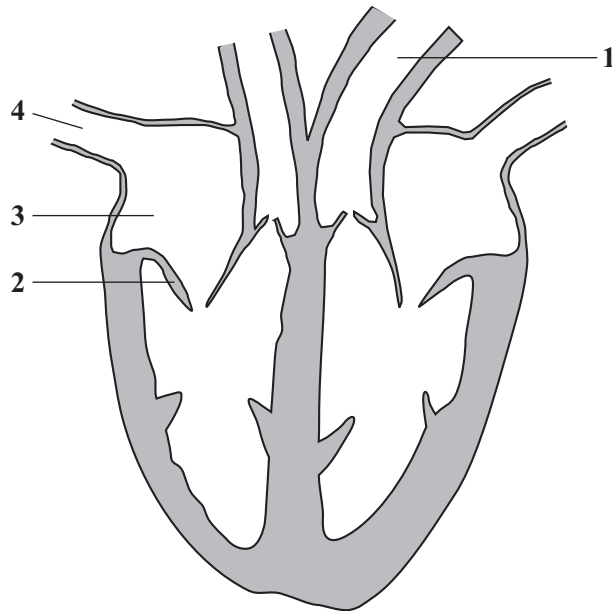The diagram shows a section through the heart.

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

artery

atrium

valve

vein

QUESTION FOUR

This question is about the meanings of some words.

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

anaerobic respiration

diffusion

emulsification

ventilation

Words	Meaning
1	A process which occurs when cells are short of oxygen
2	Breakdown of fats into small droplets
3	How sugar passes from the small intestine into the blood
4	Movement of air into and out of the lungs

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

QUESTION FIVE

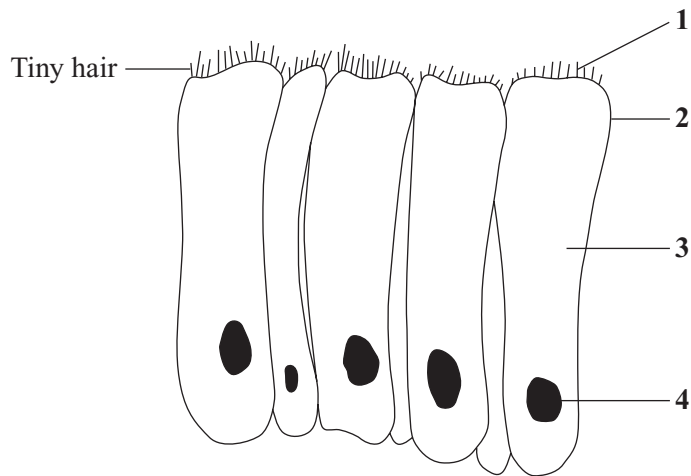The drawing shows a group of cells from the breathing system. These cells move mucus out of the lungs.

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

cell membrane

controls the activities of the cell

cytoplasm

moves the mucus

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 digestive system produces enzymes to break down food.

Which **two** of the following are enzymes?

> **amylase**
>
> **bile**
>
> **glycerol**
>
> **lipase**
>
> **lipids**

QUESTION SEVEN

Viruses and bacteria are both microbes.

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

> **cell membrane**
>
> **cell wall**
>
> **cytoplasm**
>
> **protein coat**
>
> **smaller than bacteria**

Turn over ▶

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

This question is about microorganisms and ways in which the body defends itself against them.

8.1   A bacterial cell has . . . . .

    A   a cell membrane and a nucleus but no cytoplasm.

    B   a cell wall, a cell membrane, cytoplasm and a few genes.

    C   a cell wall and a few genes but no cell membrane.

    D   a cell wall and cytoplasm but no genes.

8.2   In the airways of the breathing organs, microorganisms may be trapped by . . . . .

    A   antibodies.

    B   mucus.

    C   platelets.

    D   white blood cells.

8.3   Once microorganisms have entered the blood, they may be destroyed by . . . . .

    A   red blood cells ingesting the microorganisms.

    B   red blood cells producing antitoxins.

    C   white blood cells ingesting the microorganisms.

    D   white blood cells producing acid.

**8.4** We are immune to an infectious disease . . . . .

A if our platelets can clump together.

B if our red blood cells recognise the microorganisms.

C if our white blood cells can produce antibodies quickly when we get a second infection.

D only if we have had an injection.

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

QUESTION NINE

The diagram shows some of the structures concerned with digestion.
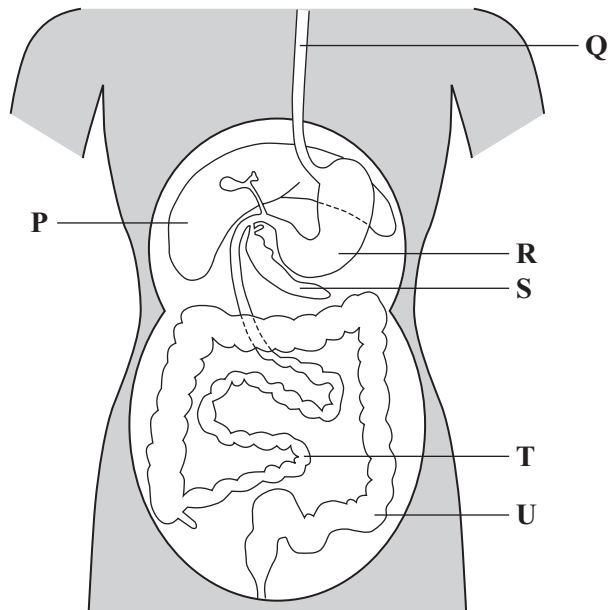
9.1 The part where the conditions are acidic is . . . . .

   A   **Q**

   B   **R**

   C   **T**

   D   **U**

9.2 The parts which produce enzymes that digest fat are . . . . .

   A   **P** and **R**

   B   **R** and **S**

   C   **R** and **T**

   D   **S** and **T**

9.3 As food passes through the digestive system the amounts of various substances change.

How do the amounts of starch and sugar change as food passes from the mouth to the end of the large intestine?

    A   Starch decreases and sugar decreases

    B   Starch decreases and sugar increases

    C   Starch increases and sugar decreases

    D   Starch increases and sugar increases

9.4 Faeces are produced in the . . . . .

    A   large intestine.

    B   liver.

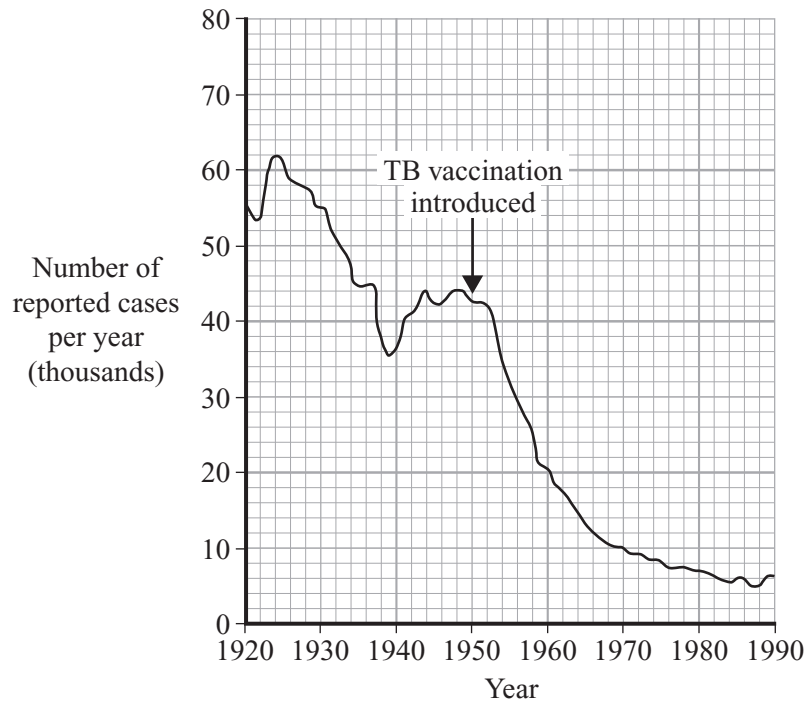   **C**   pancreas.

    D   small intestine.

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

QUESTION TEN

Tuberculosis (TB) is a disease caused by a bacterium.

The graph shows the number of cases of TB from 1920 to 1990.

10.1 What was the maximum number of reported cases of TB in a year during the period from 1920 to 1990?

  A   60

  B   62

  C   44 000

  D   62 000

10.2 The number of cases of TB decreased after the introduction of vaccination. Vaccination may not have been the only reason for this decrease.

  What evidence from the graph suggests that there may have been other reasons?

  A   The number of cases decreased between 1925 and 1940

  B   The number of cases decreased between 1950 and 1990

  C   The number of cases decreased very rapidly between 1950 and 1960

  D   The number of cases increased between 1940 and 1950

10.3 The TB vaccination causes . . . . .

A   an increase in the number of platelets.

B   red blood cells to produce antibodies.

C   white blood cells to produce antibodies.

D   white blood cells to produce toxins.

10.4 TB is spread by breathing in infected droplets which have been coughed out by infected people.

Which of the following is **least** likely to reduce the spread of TB?

A   Isolating people with the disease

B   Vaccinating all adults

C   Vaccinating all children

D   Vaccinating people who have the disease

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

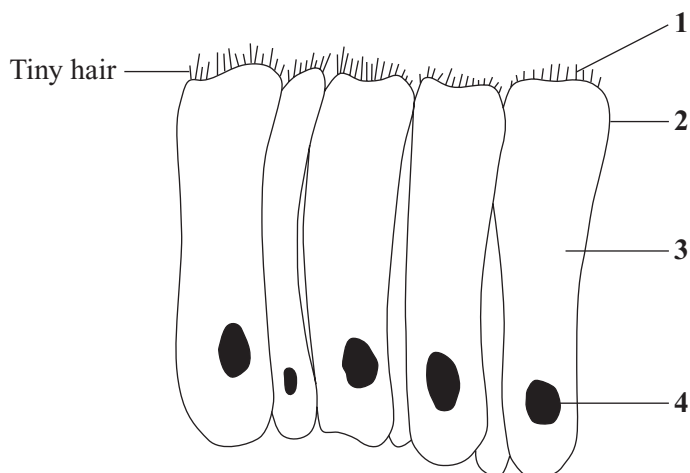The drawing shows a group of cells from the breathing system. These cells move mucus out of the lungs.

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

cell membrane

controls the activities of the cell

cytoplasm

moves the mucus

QUESTION TWO

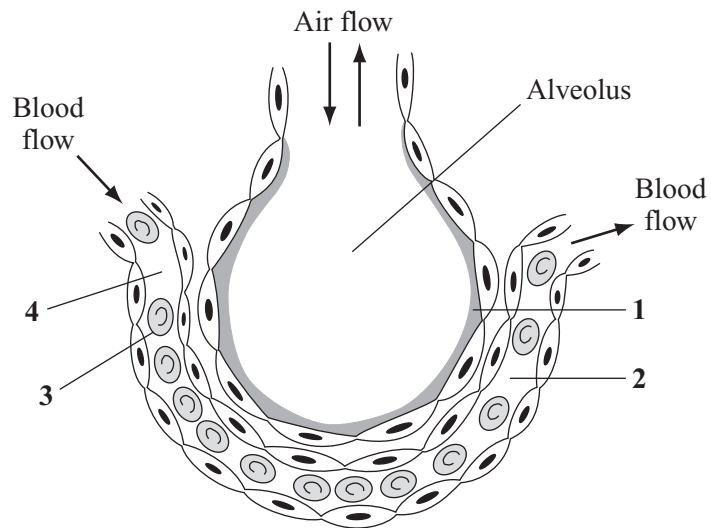The diagram shows a section through an alveolus and a capillary in the lungs.

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

blood with a high carbon dioxide content

blood with a high oxygen content

contains a red pigment

where gases enter and leave the air

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

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

Viruses and bacteria are both microbes.

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

cell membrane

cell wall

cytoplasm

protein coat

smaller than bacteria

QUESTION FOUR

The diagram shows a section of the heart

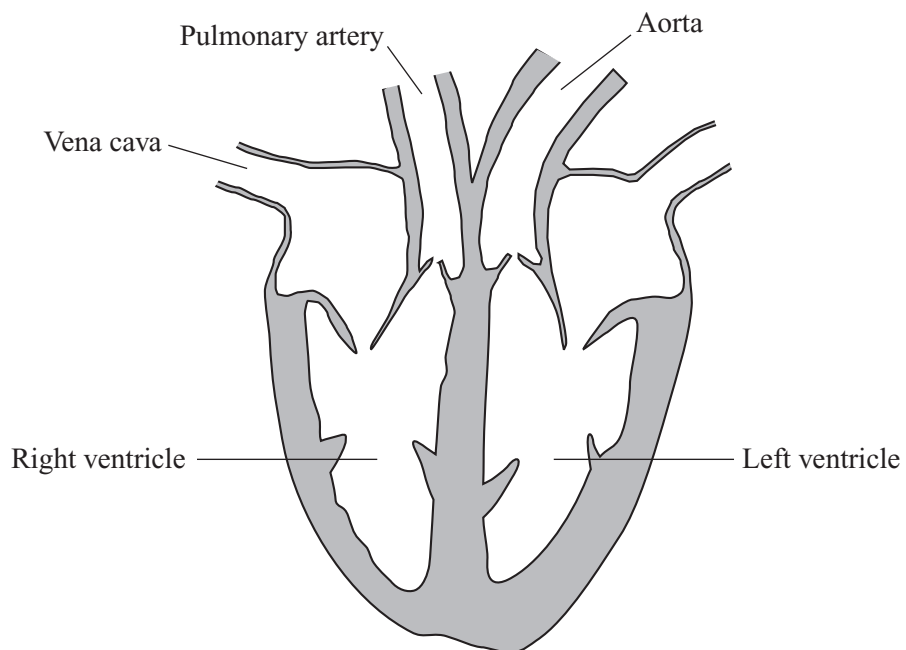Which **two** structures contain blood with a high level of oxyhaemoglobin?

aorta

left ventricle

pulmonary artery

right ventricle

vena cava

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

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

This question is about microorganisms and ways in which the body defends itself against them.

5.1   A bacterial cell has . . . . .

A   a cell membrane and a nucleus but no cytoplasm.

B   a cell wall, a cell membrane, cytoplasm and a few genes.

C   a cell wall and a few genes but no cell membrane.

D   a cell wall and cytoplasm but no genes.

5.2   In the airways of the breathing organs, microorganisms may be trapped by . . . . .

A   antibodies.

B   mucus.

C   platelets.

D   white blood cells.

5.3   Once microorganisms have entered the blood, they may be destroyed by . . . . .

A   red blood cells ingesting the microorganisms.

B   red blood cells producing antitoxins.

C   white blood cells ingesting the microorganisms.

**D**   white blood cells producing acid.

5.4   We are immune to an infectious disease . . . . .

A   if our platelets can clump together.

B   if our red blood cells recognise the microorganisms.

C   if our white blood cells can produce antibodies quickly when we get a second infection.

D   only if we have had an injection.

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

QUESTION SIX

The diagram shows some of the structures concerned with digestion.
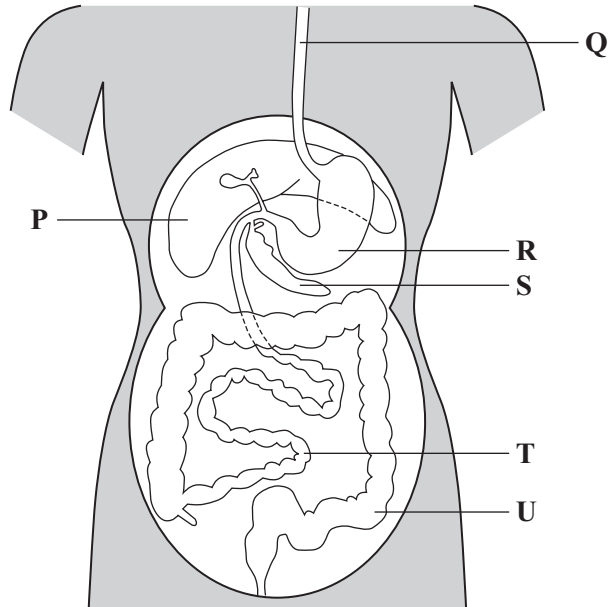
6.1   The part where the conditions are acidic is . . . . .

   A   **Q**

   B   **R**

   C   **T**

   D   **U**

6.2   The parts which produce enzymes that digest fat are . . . . .

   A   **P** and **R**

   B   **R** and **S**

   C   **R** and **T**

   D   **S** and **T**

6.3   As food passes through the digestive system the amounts of various substances change.

How do the amounts of starch and sugar change as food passes from the mouth to the end of the large intestine?

A   Starch decreases and sugar decreases

B   Starch decreases and sugar increases

C   Starch increases and sugar decreases

D   Starch increases and sugar increases

6.4   Faeces are produced in the . . . . .

A   large intestine.

B   liver.

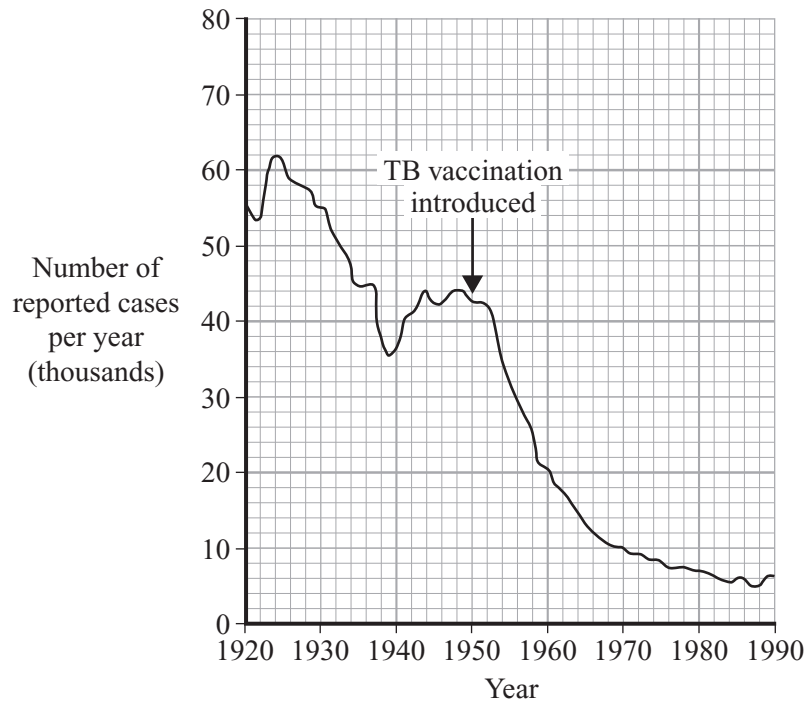**C**   pancreas.

D   small intestine.

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

QUESTION SEVEN

Tuberculosis (TB) is a disease caused by a bacterium.

The graph shows the number of cases of TB from 1920 to 1990.

7.1 What was the maximum number of reported cases of TB in a year during the period from 1920 to 1990?

  A   60

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7.2 The number of cases of TB decreased after the introduction of vaccination. Vaccination may not have been the only reason for this decrease.

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  A   The number of cases decreased between 1925 and 1940

  B   The number of cases decreased between 1950 and 1990

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  D   The number of cases increased between 1940 and 1950

7.3   The TB vaccination causes . . . . .

   A   an increase in the number of platelets.

   B   red blood cells to produce antibodies.

   C   white blood cells to produce antibodies.

   D   white blood cells to produce toxins.

7.4   TB is spread by breathing in infected droplets which have been coughed out by infected people.

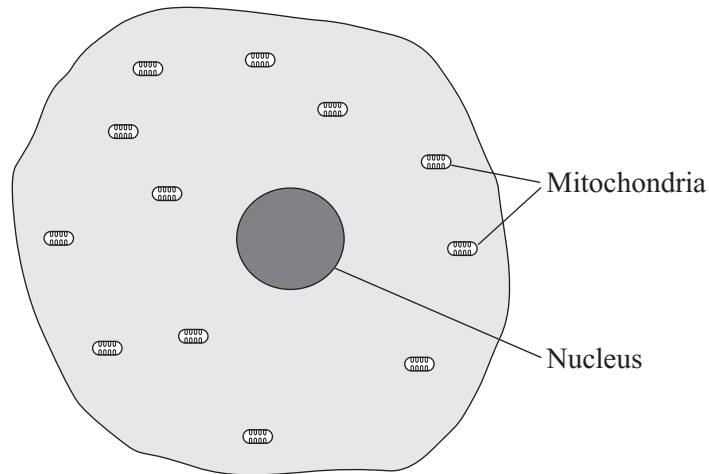Which of the following is **least** likely to reduce the spread of TB?

   A   Isolating people with the disease

   B   Vaccinating all adults

   C   Vaccinating all children

   D   Vaccinating people who have the disease

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

QUESTION EIGHT

The diagram shows a cell from the liver.

8.1 The cell has large numbers of mitochondria.

This enables the cell to . . . . .

A carry out diffusion rapidly.

B digest food materials.

C maximise energy release in respiration.

D transport oxygen rapidly.

8.2 To help the digestion of fats, liver cells . . . . .

A emulsify fats.

B produce a starch digesting enzyme.

C produce bile.

D produce lipase.

8.3 The liquid produced by the liver helps the digestion of food by . . . . .

A breaking down large molecules to small molecules.

B dissolving the amino acids in the small intestine.

C making the fat droplets larger.

D neutralising acid added to the food in the stomach.

8.4   A vein carries blood from the small intestine to the liver.

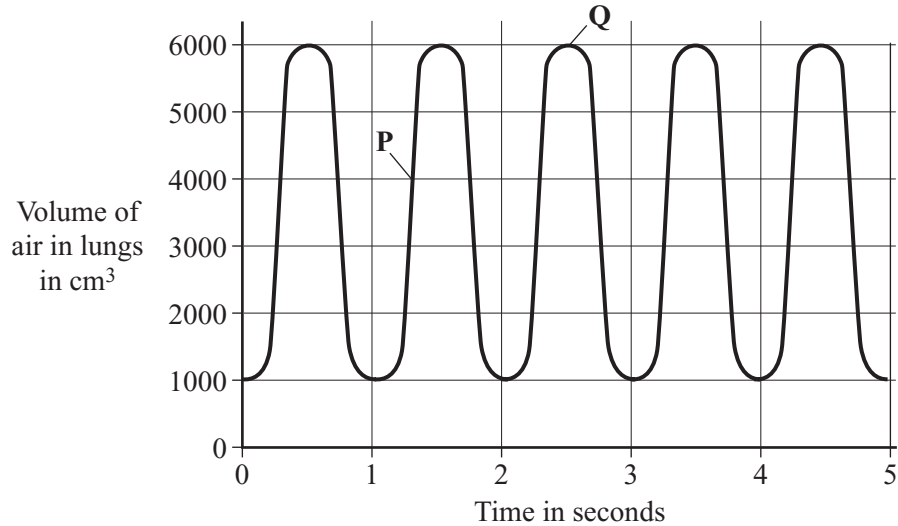After a meal the blood in this vein would contain increased amounts of . . . . .

A   protein and starch.

B   starch and amino acids.

C   starch and sugars.

D   sugars and amino acids.

TURN OVER FOR THE NEXT QUESTION

QUESTION NINE

The graph shows changes in the volume of air in the lungs of an athlete after a race.

9.1 At point **P** . . . . .

    A   air is entering the lungs.

    B   air is leaving the lungs.

    C   no gaseous exchange is taking place in the lungs.

    D   the muscles of the diaphragm are relaxed.

9.2 At point **Q** . . . . .

    A   air pressure in the lungs is greater than atmospheric pressure.

    B   air pressure in the lungs is less than atmospheric pressure.

    C   air pressure in the lungs is the same as atmospheric pressure.

    D   you cannot tell whether air pressure in the lungs is greater or less than atmospheric pressure.

9.3   What is the total volume of air breathed in and out of the lungs between **P** and **Q**?

A $2\,000\,cm^3$

B $4\,000\,cm^3$

C $12\,000\,cm^3$

D $27\,000\,cm^3$

9.4   How many breaths per minute is the athlete taking?

A   4
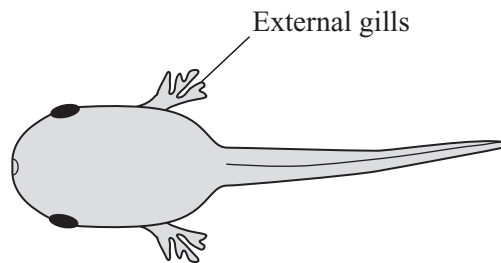
B   5

C   30

D   60

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

QUESTION TEN

The drawing shows a tadpole that lives in fresh water. Oxygen from the water reaches the tadpole's blood through both its skin and the external gills shown in the drawing.

External gills

10.1 The external gills are useful to the tadpole because they increase its . . . . .

    A   mass.

    B   surface area.

    C   volume.

    D   width.

10.2 Oxygen is transferred from the water into the gills because . . . . .

    A   blood is always taking oxygen away from the gills.

    B   the gills are branched.

    C   the tadpole has no lungs.

    D   the tadpole stays in one place most of the time.

10.3 Carbon dioxide will most probably . . . . .

    A   diffuse mainly from the blood into the muscles.

    B   diffuse mainly from the blood into the water.

    C   diffuse mainly from the mouth into the water.

    D   diffuse mainly from the water into the blood.

10.4 The red blood cells of the tadpole are the same size as human red blood cells, but tadpole red blood cells have nuclei. Both human red blood cells and tadpole red blood cells contain haemoglobin in the cytoplasm. The concentration of haemoglobin is the same in both tadpole red blood cells and human red blood cells.

Compared with human red blood cells tadpole red blood cells . . . . .

A   carry less oxygen because tadpoles are not as advanced as humans.

B   carry less oxygen because they have less haemoglobin.

C   carry more oxygen because the nucleus controls oxygen transport.

D   carry more oxygen because they can live longer.

END OF TEST