| Surname | | Other Names | |
|---|---|---|---|
| Centre Number | | | Candidate Number | | | | |
| Candidate Signature | | | | | | | | | |

General Certificate of Secondary Education
November 2006

**BIOLOGY (SPECIFICATION A) (MODULAR) 346019**
**Moving and Feeding (Module 19)**

Thursday 23 November 2006 Morning Session

**For this paper you must have:**
- a black ball-point pen
- an objective test answer sheet

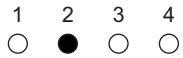
You may use a calculator.

Time allowed: 30 minutes

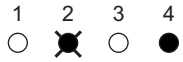
**Instructions**
- Fill in the boxes at the top of this page.
- Check that your name, candidate number and centre number are printed on the separate answer sheet.
- Check that the separate answer sheet has the title 'Moving and Feeding' printed on it.
- Attempt **one Tier only**, **either** the Foundation 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.
- Do all rough work in this book, **not** on your answer sheet.

**Instructions for recording answers**

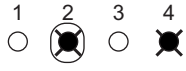
- Use a **black ball-point pen**.
- For each answer **completely fill in the circle** as shown:




- 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 16 of this booklet.

**FOUNDATION TIER**

**SECTION A**

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

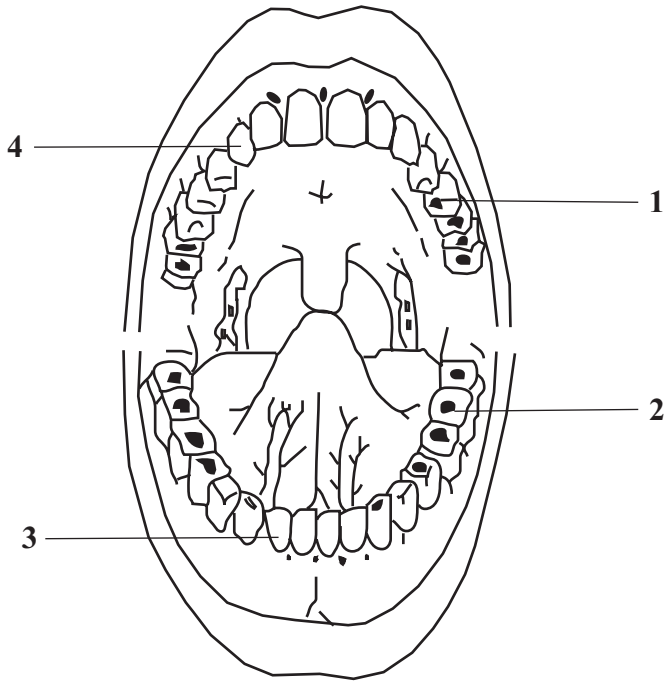
In these questions match words in the list with the numbers.

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

Mark your choices on the answer sheet.

## QUESTION ONE

The diagram shows the teeth in a human mouth.




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

**canine tooth**

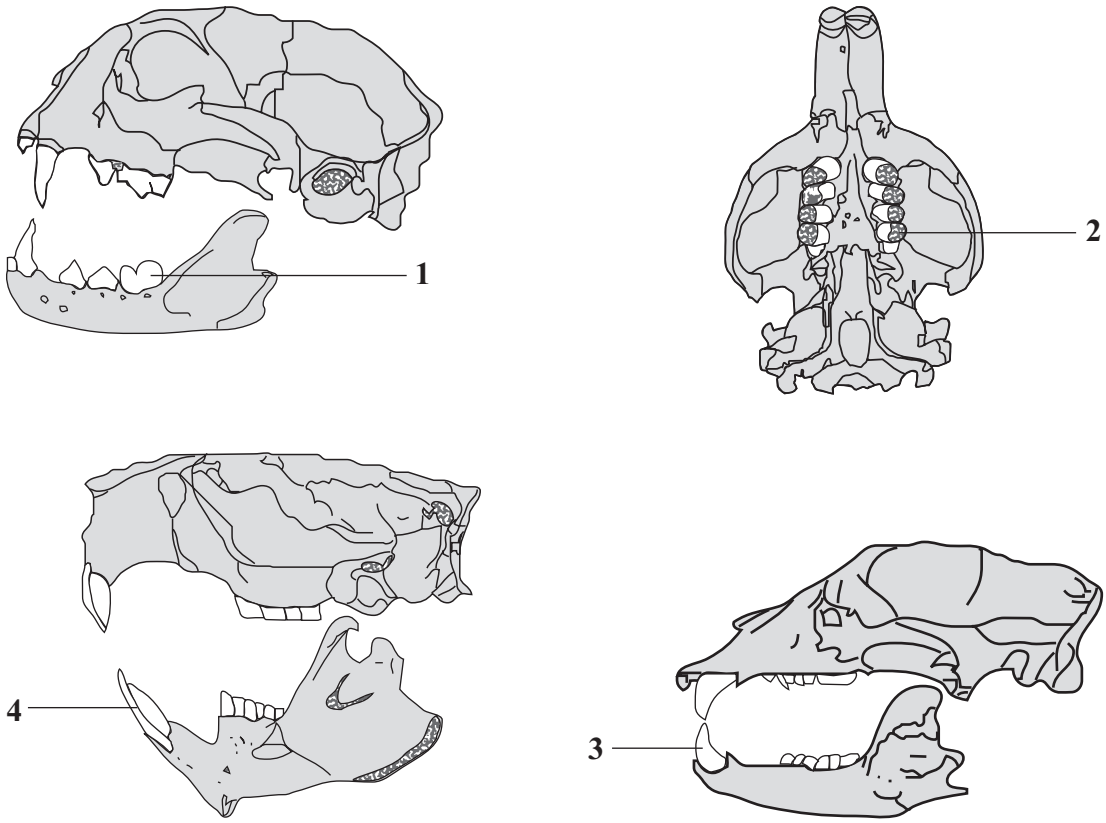
**incisor tooth**

**premolar tooth**

**molar tooth**

## QUESTION TWO

The diagrams show the teeth in several animal skulls. (The diagrams are not to scale.)




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

**sharp and pointed to grip prey**

**used to bite food**

**used to crush food and grind food**

**used to shear meat and crush bones**

**Turn over for the next question**

**QUESTION THREE**

The diagram shows a joint.

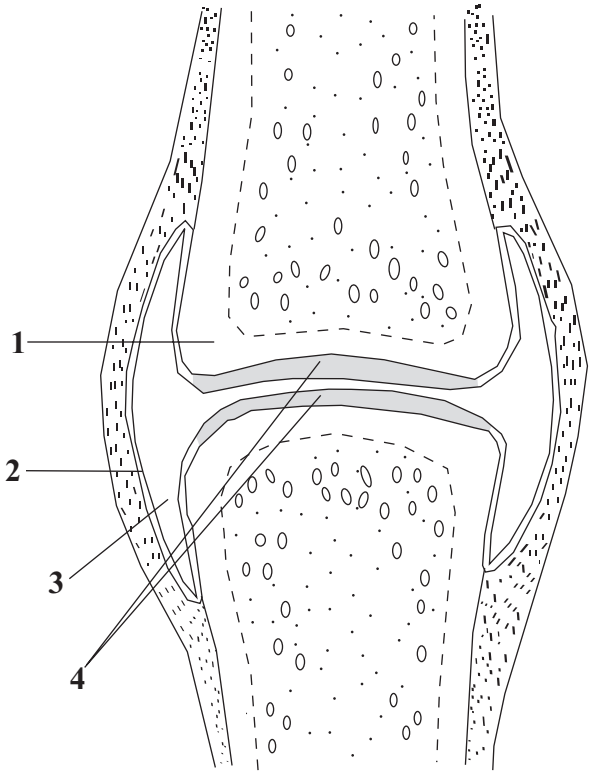
Match words from the list with the labels **1–4** on the diagram.

**bone**

**cartilage**

**joint membrane**

**synovial fluid**



## QUESTION FOUR

The table lists some features of birds which help them to fly.

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

**bones**

**flight feathers**

**muscles**

**streamlined body shapes**

| Part of body | How it helps the bird to fly |
|---|---|
| **1** | are honey-combed |
| **2** | contract to move the wings |
| **3** | provide a large surface area |
| **4** | reduce air resistance |

**Turn over for the next question**

**QUESTION FIVE**

The diagram shows how mussels feed.

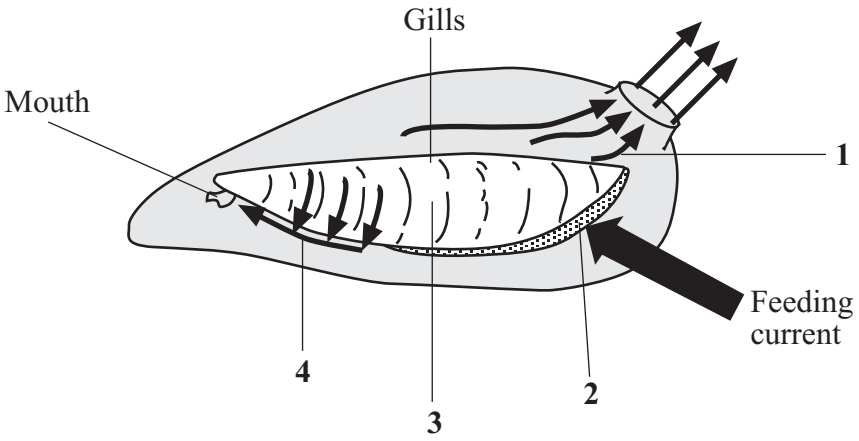
Match words from the list with the labels **1–4** on the diagram.

**cilia beat to draw in a current of water**

**cilia move trapped plankton to the mouth**

**plankton is filtered out of the water**

**water is forced out of the body**



## 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

Which **two** of the following help a mosquito to suck blood from a capillary?

**a needle-like proboscis**

**gills which help to trap blood cells**

**hair-like cilia**

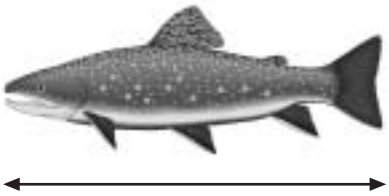
**strong jaws**

**throat muscles**

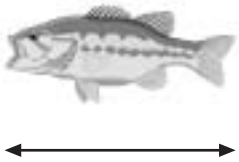
**Turn over for the next question**

**QUESTION SEVEN**

Two fish were compared to see how fast they could swim.



50 cm
Average speed = 5 km / hour
Mass = 2.5 kg



30 cm
Average speed = 42 km / hour
Mass = 0.9 kg

Which **two** features appear to be **most** important in helping a fish to swim faster?

**a pointed head**

**short body**

**small fins**

**small mass**

**the shape of the tail**

**Turn over for the next question**

## SECTION C

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

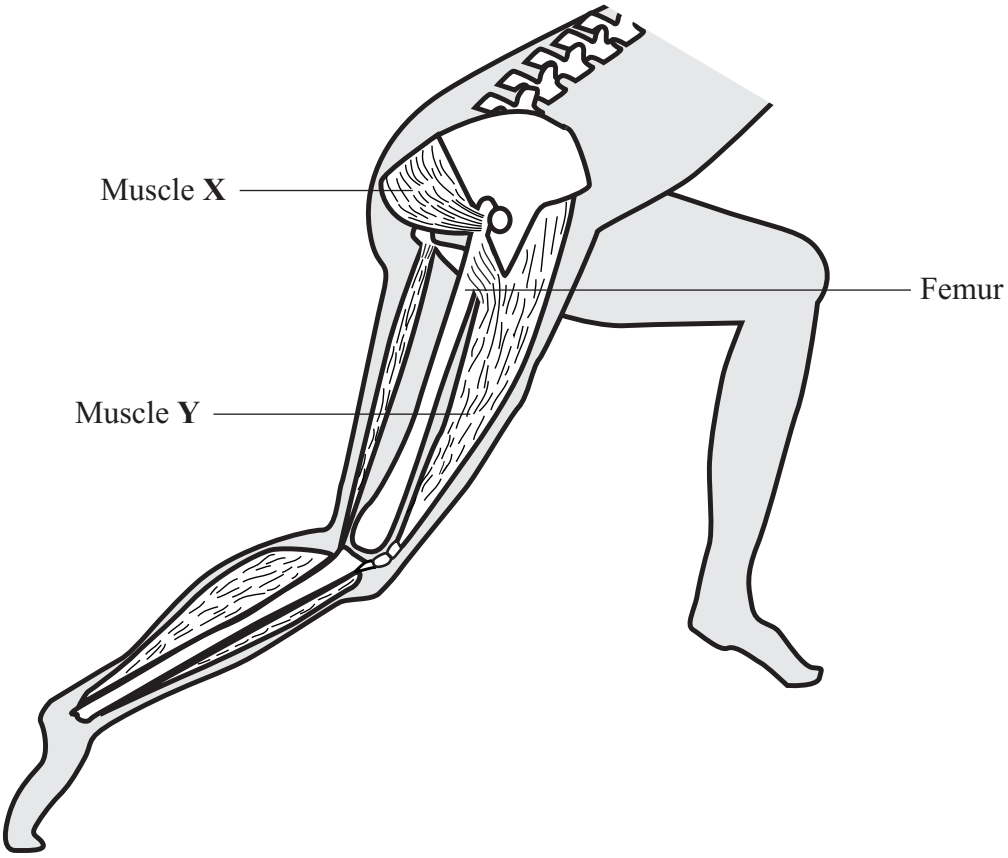
Each of these questions has four parts.

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

Mark your choices on the answer sheet.

## QUESTION EIGHT

The drawing shows the bones and muscles in a human leg.




**8.1** The bones in the leg are . . .

**A** able to contract.

**B** elastic.

**C** used for support and movement.

**D** used only for muscle attachment.

**8.2** The bones at a joint are held together by . . .

**A** cartilage.

**B** ligaments.

**C** muscles.

**D** synovial membranes.

**8.3** When muscle **X** contracts . . .

**A** the femur is pulled backwards.

**B** the femur is pulled forwards.

**C** the leg bends at the knee.

**D** the leg straightens at the knee.

**8.4** When muscle **Y** contracts . . .

**A** the femur is pulled backwards.

**B** the leg bends at the ankle.

**C** the leg bends at the knee.

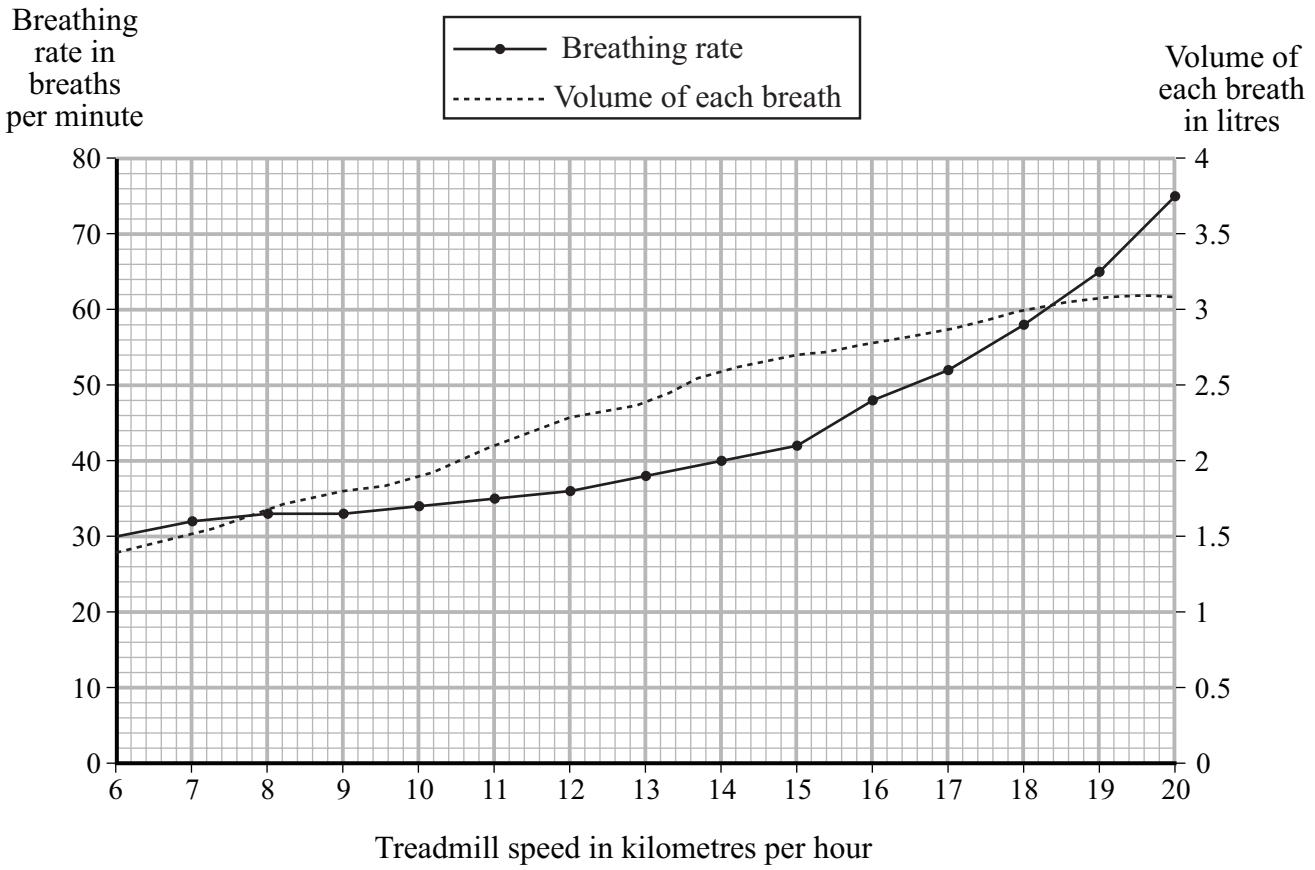
**D** the leg straightens at the knee.

**Turn over for the next question**

**QUESTION NINE**

An athlete was using a treadmill at different speeds.
Her breathing rate and the volume of each breath were recorded.

The graph shows the results.



**9.1** How much air was breathed in each minute at a treadmill speed of 12 kilometres per hour?

**A** 8.64 litres

**B** 73.6 litres

**C** 82.8 litres

**D** 87.4 litres

**9.2** What was the difference between the volumes of the largest and smallest breaths shown on the graph?

**A** 1.6 litres

**B** 1.7 litres

**C** 26.9 litres

**D** 44 litres

**9.3** The treadmill speed was changed from 9 kilometres per hour to 15 kilometres per hour.

By how much did the volume of each breath increase?

**A** $\frac{1}{4}$

**B** 0.8 litres

**C** 50 %

**D** 100 %

**9.4** Which of the following statements is correct?

**A** Blood leaving the muscles during exercise contains increased amounts of carbon dioxide and glucose.

**B** During exercise energy released as heat is used to prevent the muscles from becoming tired.

**C** Energy is released by respiration in the muscles.

**D** Oxygen from the air is used to keep muscles warm.

## QUESTION TEN

Two groups of children were surveyed to find out if the incidence of malaria was affected by where they lived.

The **at risk group** lived near water such as rivers, lakes and streams.

The **control group** lived in dry areas.

The table shows the incidence of malaria per 1000 children in each group through one year.

| | **Incidence of malaria per 1000 children** | | | |
|---|---|---|---|---|
| | **Jan–Feb** | **Apr–May** | **Jul–Aug** | **Oct–Nov** |
| **At risk group** | 9.62 | 12.95 | 14.25 | 52.78 |
| **Control group** | 1.47 | 2.11 | 2.36 | 5.70 |

**10.1** What was the difference in the incidence of malaria in the **at risk group** between Jan–Feb and Oct–Nov?

**A** 43.16 cases per 1000 children

**B** 431.6 cases per 1000 children

**C** 4 316 cases per 1000 children

**D** 43 160 cases per 1000 children

**10.2** The rate ratio is the incidence of malaria in the **control group** divided by the incidence of malaria in the **at risk group**.

At which two times of the year were the rate ratios closest?

**A** Jan–Feb and Apr–May

**B** Jan–Feb and Jul–Aug

**C** Apr–May and Jul–Aug

**D** Jul–Aug and Oct–Nov

**10.3** How could the results of the survey be made more reliable?

**A** Checking the data by repeating the survey

**B** Collecting the data every six months

**C** Counting the numbers of rivers and lakes

**D** Dividing the results by the number of the children in the survey

**10.4** Malaria is caused when mosquitoes inject single-celled organisms into the human body.

Mosquitoes feed on . . .

**A** blood from other mosquitoes.

**B** human blood.

**C** human saliva.

**D** skin 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 words in the list with the numbers.

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

Mark your choices on the answer sheet.

### QUESTION ONE

The diagram shows how mussels feed.

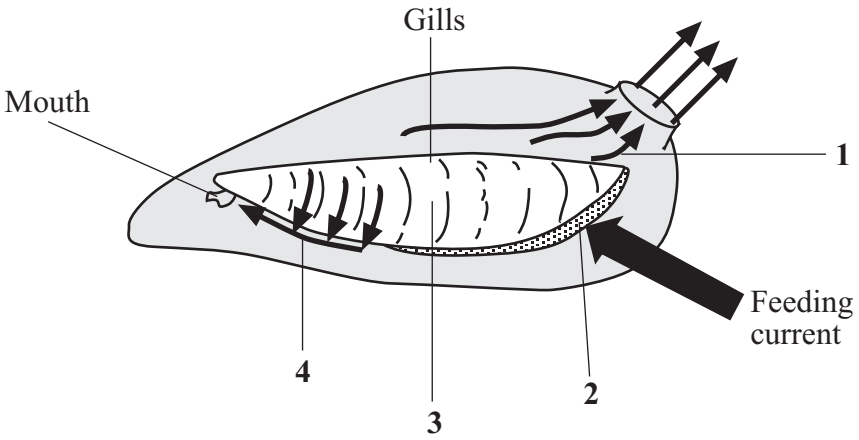
Match words from the list with the labels **1–4** on the diagram.

**cilia beat to draw in a current of water**

**cilia move trapped plankton to the mouth**

**plankton is filtered out of the water**

**water is forced out of the body**



**QUESTION TWO**

The diagram shows a bird in flight.

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

**downstroke**

**flat**

**lift**

**upstroke**

During flight the . . . **1** . . . is the power stroke.

During this movement the feathers are . . . **2** . . . against each other.

The wing pushes against the air to provide . . . **3** . . . .

On the . . . **4** . . . the feathers turn to allow air through.

**Turn over for the next question**

## SECTION B

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

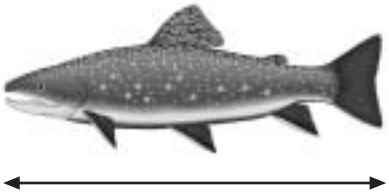
In these questions choose the best **two** answers.

Do **not** choose more than two.

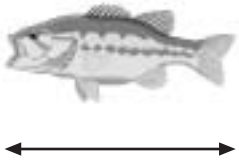
Mark your choices on the answer sheet.

## QUESTION THREE

Two fish were compared to see how fast they could swim.



50 cm
Average speed = 5 km / hour
Mass = 2.5 kg



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Which **two** features appear to be **most** important in helping a fish to swim faster?

**a pointed head**

**short body**

**small fins**

**small mass**

**the shape of the tail**

**QUESTION FOUR**

Bone contains calcium phosphate and protein.

Which **two** properties do calcium phosphate and protein give to bone?

**it can be compressed**

**it can contract**

**it is hard**

**it is slippery**

**prevent it from being brittle**

**Turn over for the next question**

## SECTION C

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

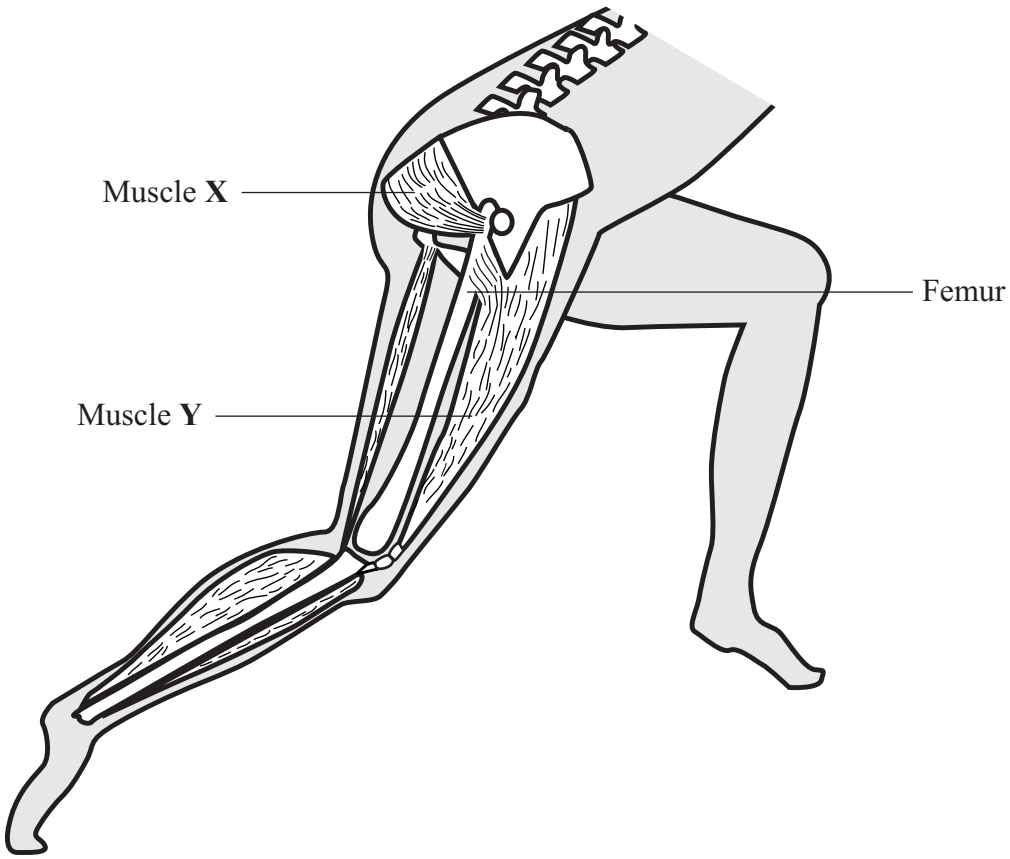
Each of these questions has four parts.

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

Mark your choices on the answer sheet.

### QUESTION FIVE

The drawing shows the bones and muscles in a human leg.




**5.1** The bones in the leg are . . .

**A** able to contract.

**B** elastic.

**C** used for support and movement.

**D** used only for muscle attachment.

**5.2** The bones at a joint are held together by . . .

**A** cartilage.

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**5.3** When muscle **X** contracts . . .

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**5.4** When muscle **Y** contracts . . .

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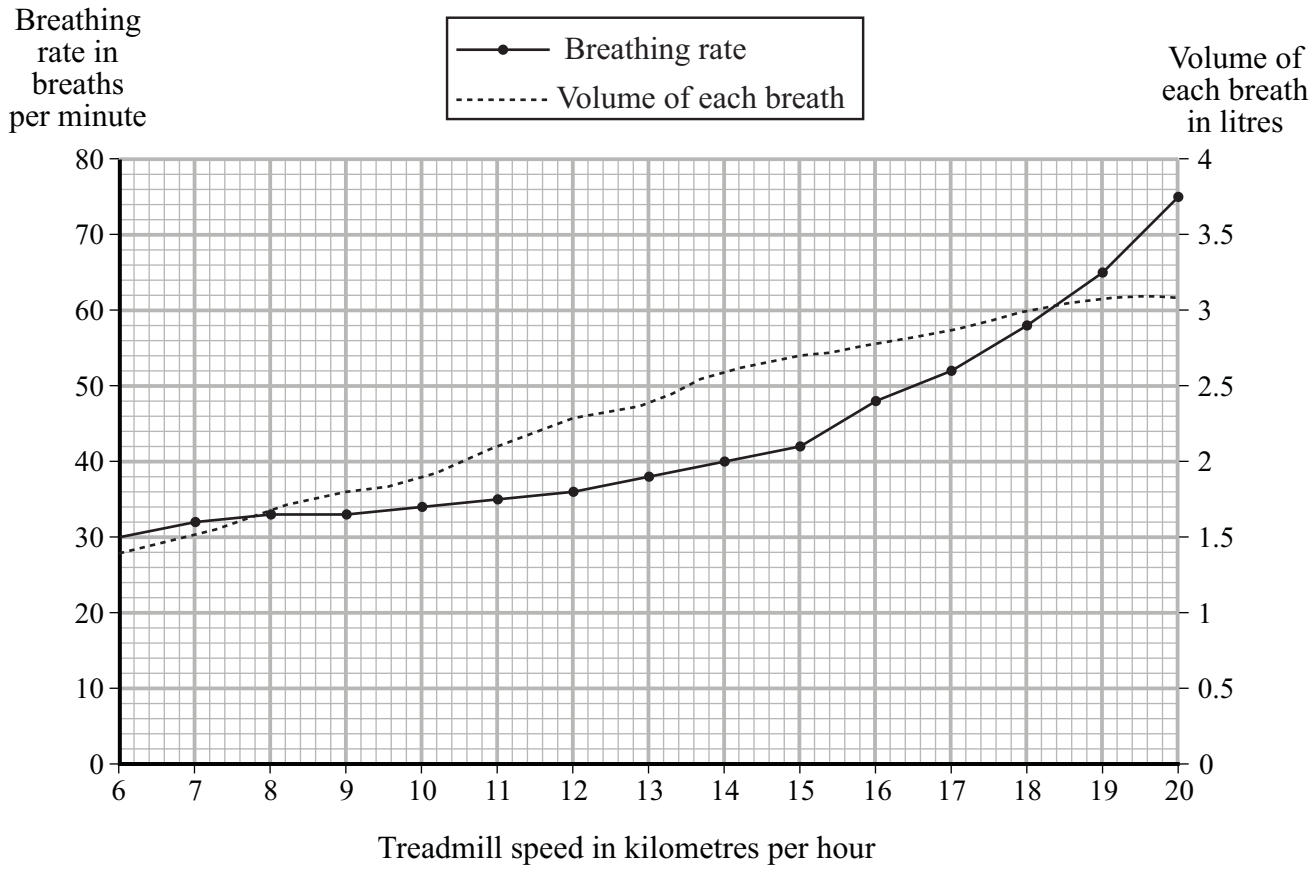
**Turn over for the next question**

**QUESTION SIX**

An athlete was using a treadmill at different speeds.
Her breathing rate and the volume of each breath were recorded.

The graph shows the results.



**6.1** How much air was breathed in each minute at a treadmill speed of 12 kilometres per hour?

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**6.2** What was the difference between the volumes of the largest and smallest breaths shown on the graph?

**A** 1.6 litres

**B** 1.7 litres

**C** 26.9 litres

**D** 44 litres

**6.3** The treadmill speed was changed from 9 kilometres per hour to 15 kilometres per hour.

By how much did the volume of each breath increase?

**A** $\frac{1}{4}$

**B** 0.8 litres

**C** 50 %

**D** 100 %

**6.4** Which of the following statements is correct?

**A** Blood leaving the muscles during exercise contains increased amounts of carbon dioxide and glucose.

**B** During exercise energy released as heat is used to prevent the muscles from becoming tired.

**C** Energy is released by respiration in the muscles.

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**QUESTION SEVEN**

Two groups of children were surveyed to find out if the incidence of malaria was affected by where they lived.

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**7.3** How could the results of the survey be made more reliable?

**A** Checking the data by repeating the survey

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**C** Counting the numbers of rivers and lakes

**D** Dividing the results by the number of the children in the survey

**7.4** Malaria is caused when mosquitoes inject single-celled organisms into the human body.

Mosquitoes feed on . . .

**A** blood from other mosquitoes.

**B** human blood.

**C** human saliva.

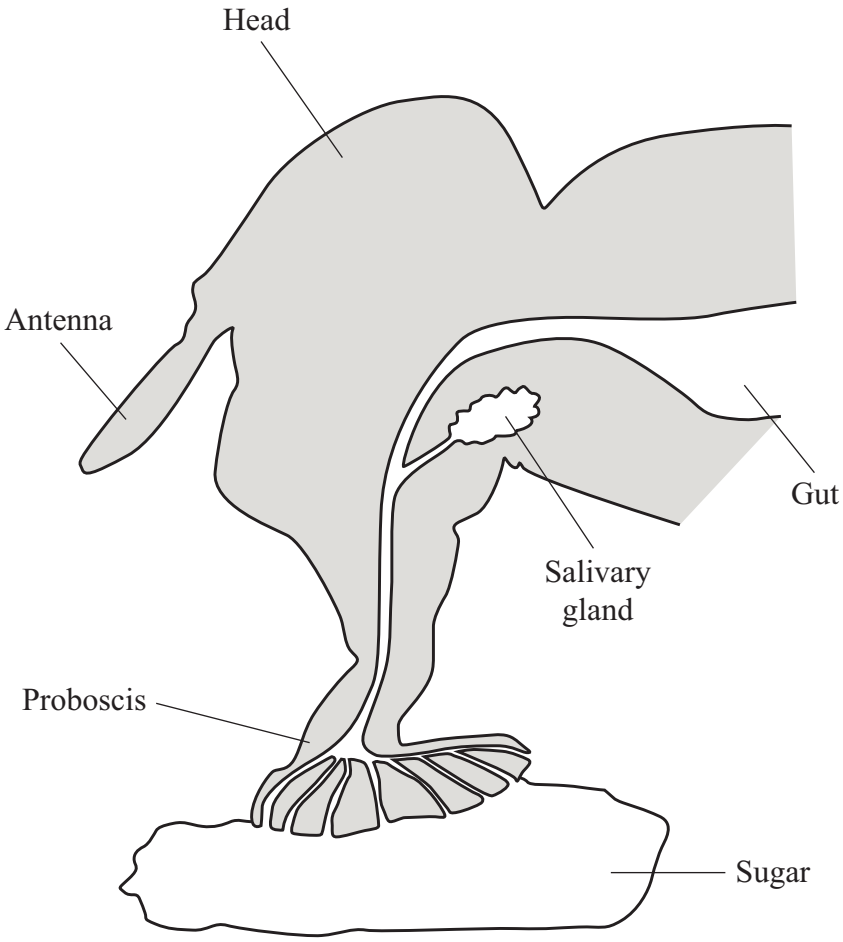
**D** skin cells.

**Turn over for the next question**

**QUESTION EIGHT**

The diagram shows a section through part of the body and head of a housefly.

Houseflies often feed on sugary substances. They secrete saliva onto the food and then suck up the mixture of saliva and food into the gut.




**8.1** The housefly releases saliva onto the food to . . .

**A** change the food to a fluid.

**B** dehydrate the food.

**C** stick the food particles together.

**D** transfer bacteria to the food.

**8.2** Why does a housefly's proboscis have fine tubes in it?

**A** To attach the proboscis to the food

**B** To chop up the food

**C** To crush the food

**D** To spread saliva over the food

**8.3** The advantage of the flattened proboscis is that it . . .

**A** brings the salivary gland closer to the food.

**B** can absorb solid food.

**C** gives a larger surface area for sucking up food.

**D** gives balance to the housefly when feeding.

**8.4** A housefly cannot transmit malaria to humans because . . .

**A** a housefly's proboscis cannot penetrate the human skin.

**B** a housefly's saliva is not concentrated enough.

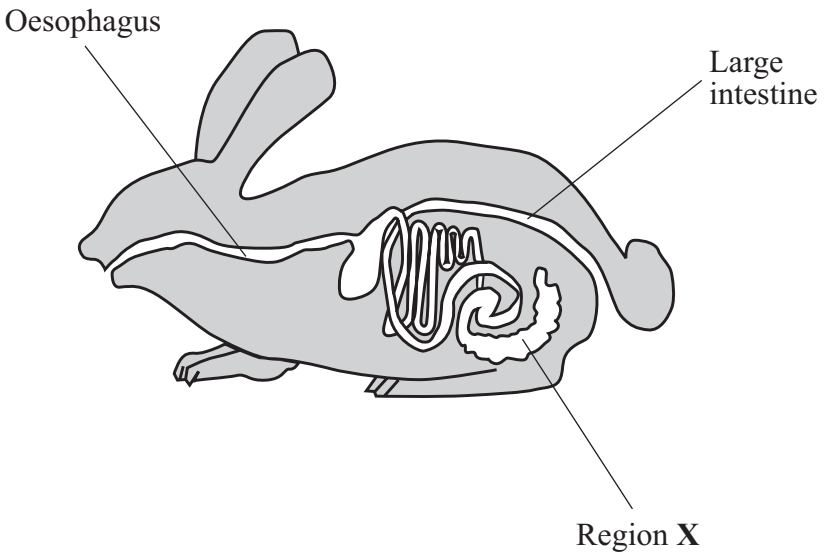
**C** houseflies do not live in hot climates.

**D** humans can feel them land on the skin.

**Turn over for the next question**

**QUESTION NINE**

The diagram shows the digestive system of a rabbit.




**9.1** Region **X** is called . . .

**A** the caecum.

**B** the rumen.

**C** the small intestine.

**D** the stomach.

**9.2** Region **X** contains bacteria.

The bacteria release enzymes which can digest . . .

**A** cellulose.

**B** fats.

**C** protein.

**D** sugars.

**9.3** To absorb all the substances produced by digestion in their gut, rabbits . . .

**A** eat their own faeces.

**B** grind food down with their molar teeth.

**C** leave food in the rumen for a long time.

**D** pass food back to their mouth from their stomach.

**9.4** The relationship between the rabbit and the bacteria in region **X** is an example of . . .

**A** digestion.

**B** grazing.

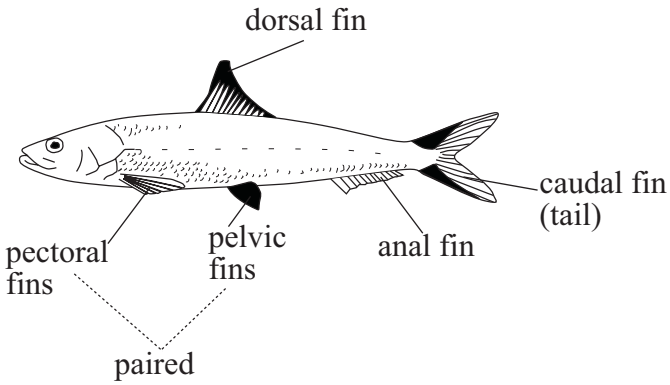
**C** mutualism.

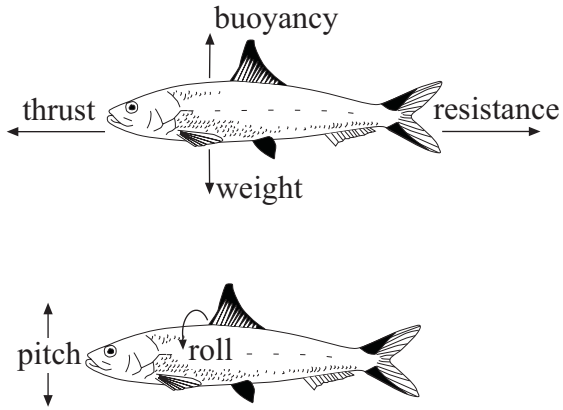
**D** parasitism.

**Turn over for the next question**

**QUESTION TEN**

The diagrams show some of the features involved in the movement of fish.




**10.1** Which fin provides most of the thrust to move the fish forward in the water?

**A** Anal fin

**B** Caudal fin

**C** Dorsal fin

**D** Pelvic fin

**10.2** Which fin helps to prevent the fish from pitching up and down in the water?

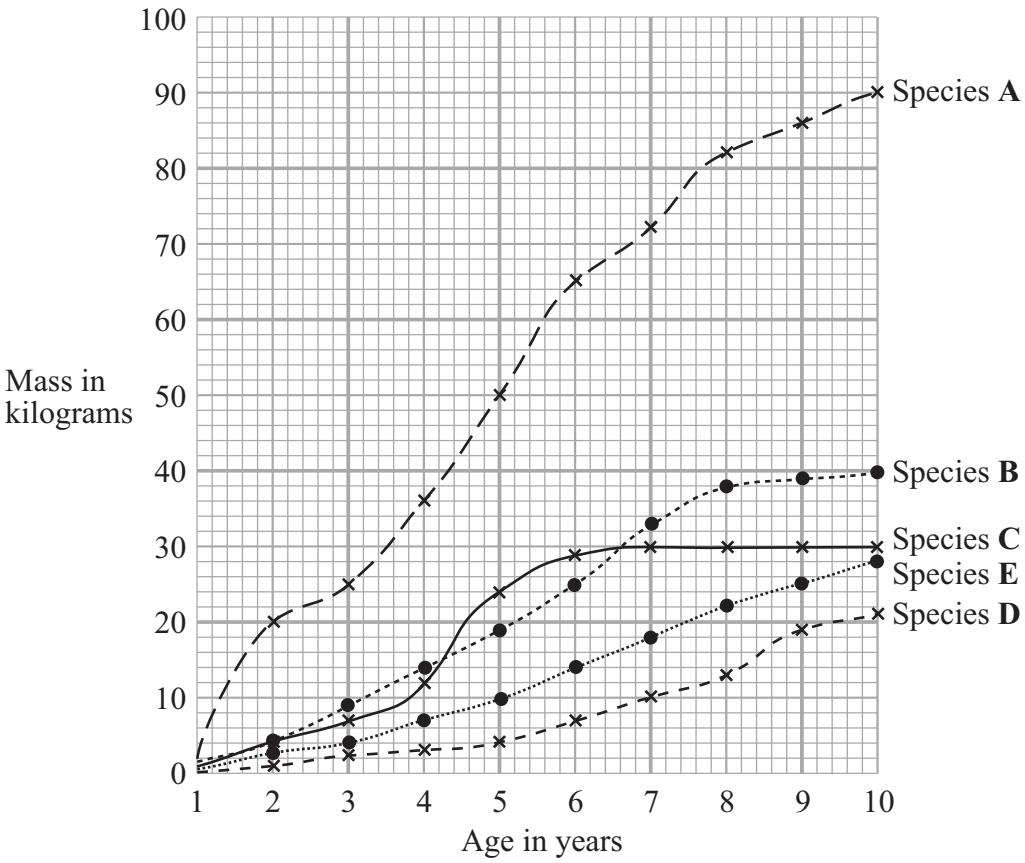
**A** Anal fin

**B** Caudal fin

**C** Dorsal fin

**D** Pectoral fin

The graph shows the age and mass of several species of fish.




**10.3** What happens to the mass of Species **C** between ages 4 and 7 years?

**A** It doubles.

**B** It increases by 150 %.

**C** It increases by 200 %.

**D** It increases by 250 %.

**10.4** Which fish is growing most quickly?

**A** Species **B** between ages 6 and 7 years

**B** Species **C** between ages 4 and 5 years

**C** Species **D** between ages 8 and 9 years

**D** Species **E** between ages 1 and 2 years

**END OF TEST**

**There are no questions printed on this page**