Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

General Certificate of Secondary Education
Winter 2005

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

Thursday 24 November 2005 Morning Session

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

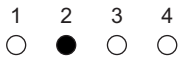
You may use a calculator.

Time allowed: 30 minutes

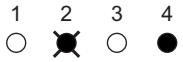
Instructions
- Fill in the boxes at the top of this page.
- Check that your name, candidate number and centre number are printed on the separate answer sheet.
- Check that the separate answer sheet has the title "Moving and Feeding" printed on it.
- Attempt **one Tier only**, **either** the Foundation 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. Rough work may be done on the question paper.

Instructions for recording answers

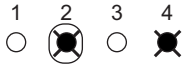
- Use a **black ball-point pen**.
- For each answer **completely fill in the circle** as shown:



- 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**.

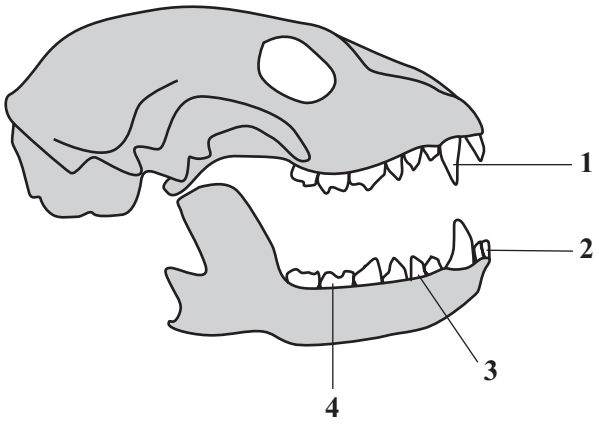
In these questions match the words in the list with the numbers.

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

Mark your choices on the answer sheet.

QUESTION ONE

The drawing shows the skull of a racoon.



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

canine tooth

incisor tooth

molar tooth

premolar tooth

QUESTION TWO

The diagram shows the structures which help to bend and straighten the arm.

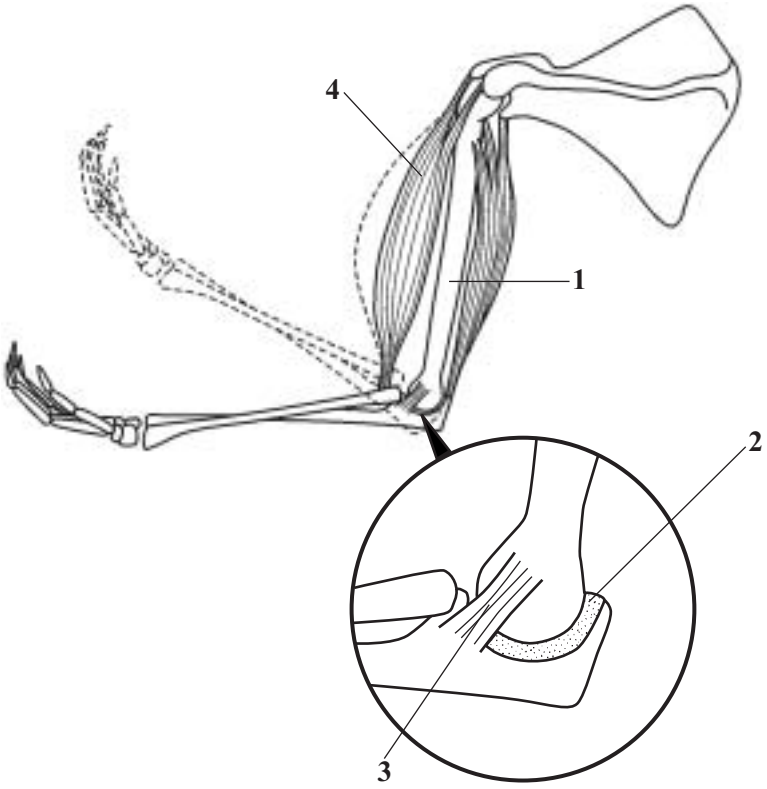
Match words from the list with the labels **1– 4** on the diagram.

bone

ligament

muscle

synovial fluid



TURN OVER FOR THE NEXT QUESTION

QUESTION THREE

The diagram shows a bird's wing.

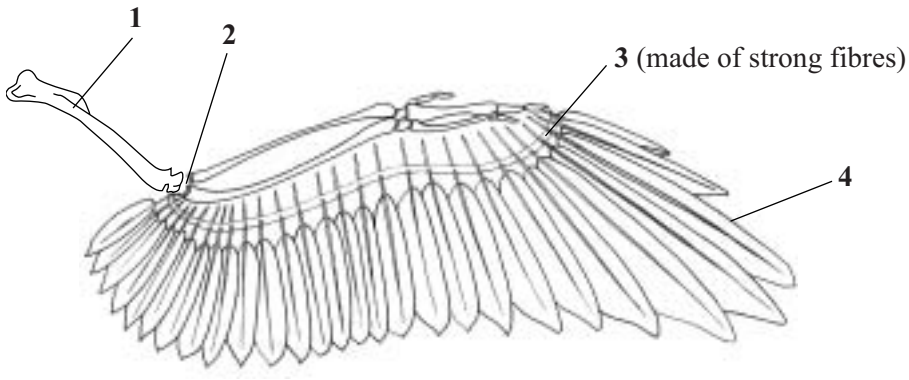
Match words from the list with labels **1–4** on the diagram.

bone

feather

joint

ligament



QUESTION FOUR

Female mosquitoes feed from humans.

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

blood

saliva

skin

throat

Mosquitoes use their proboscis to penetrate the . . . . . **1** . . . . . .

They have muscles in the . . . . . **2** . . . . . to help them suck up . . . . . **3** . . . . . .

The mosquitoes produce . . . . . **4** . . . . . to prevent clotting.

QUESTION FIVE

Exercise helps to keep the body healthy.

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

smooth

stiff

strong

tensed

Regular exercise keeps muscle fibres slightly . . . . . **1** . . . . . .

It also keeps the muscles . . . . . **2** . . . . . and prevents them from feeling . . . . . **3** . . . . . after exercise.

Exercise also helps to keep movement at joints . . . . . **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

Fish are adapted to swim in water.

Which **two** of the following help fish to swim?

a tail fin with large surface area

a zig-zag arrangement of muscles in the body

cilia that produce a current of water

feathers

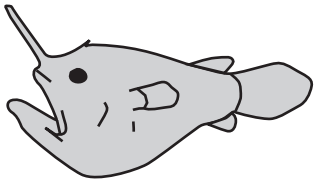
gills

QUESTION SEVEN

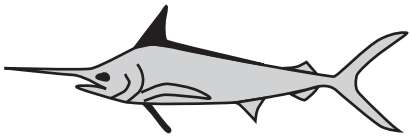
Fish are adapted for living in water in a variety of ways.

Which **two** of the following fish have bodies adapted for rapid movement through water?

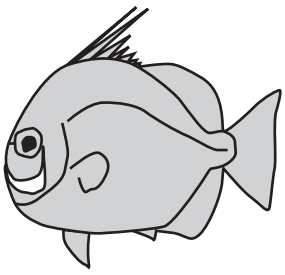
(The drawings are **not** to scale.)



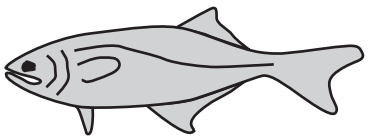
Angler fish



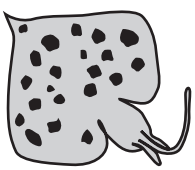
Billfish



Batfish



Salmon



Smooth skate

NO QUESTIONS APPEAR ON THIS PAGE

TURN OVER FOR THE NEXT QUESTION

SECTION C

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

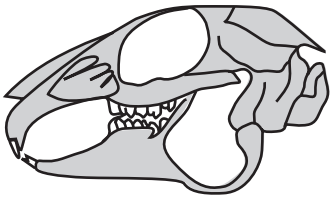
Each of these questions has four parts.

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

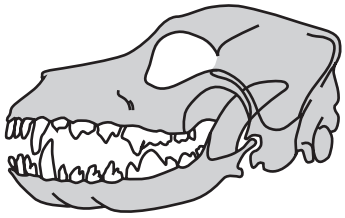
Mark your choices on the answer sheet.

QUESTION EIGHT

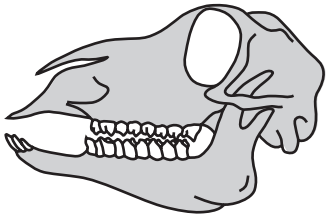
The drawings show the skulls of four mammals. (The drawings are **not** to scale.)



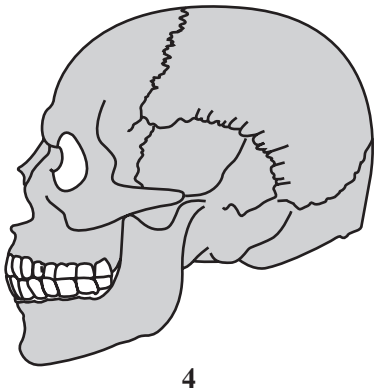
1



2



3



4

8.1 Which **two** of the skulls have canine teeth?

A **1** and **2**

B **1** and **3**

C **2** and **4**

D **3** and **4**

8.2 Which skull has specially adapted teeth for crushing bones?

A **1**

B **2**

C **3**

D **4**

8.3 Which **two** skulls have a space in the dentition?

A **1** and **2**

B **1** and **3**

C **2** and **4**

D **3** and **4**

8.4 Which **two** of the mammals are most likely to feed by biting off small pieces of plant food and moving them to the back of the mouth to be chewed?

A **1** and **2**

B **1** and **3**

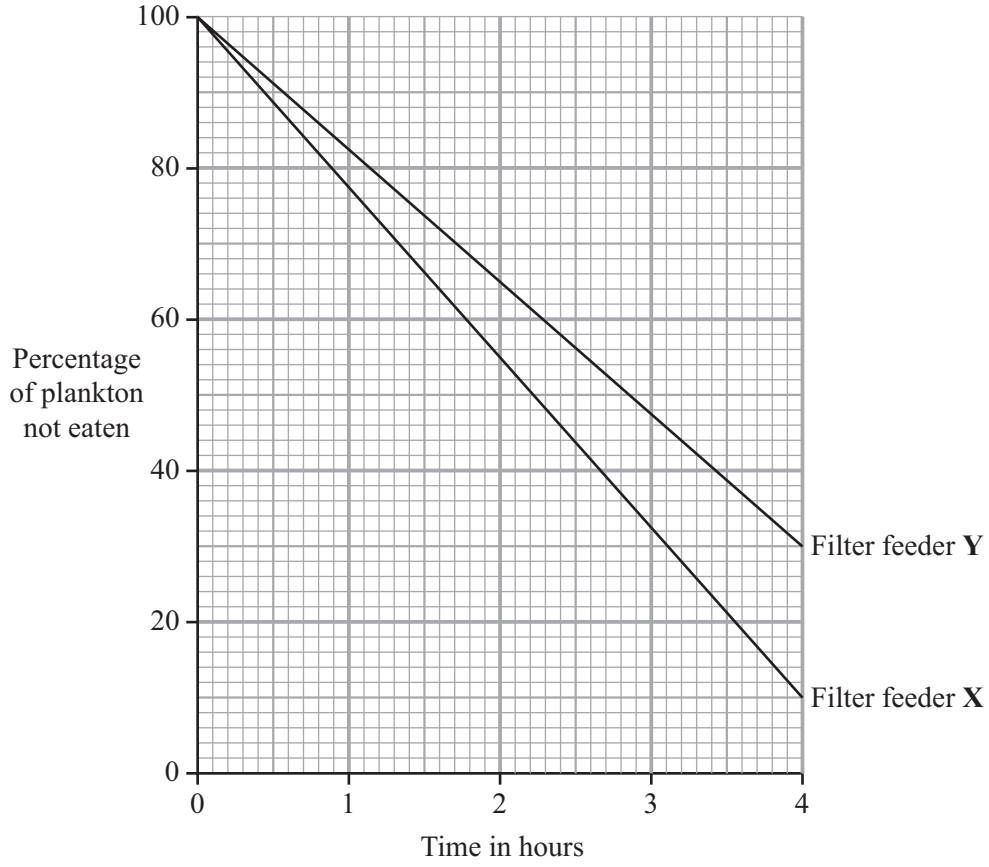
C **2** and **3**

D **2** and **4**

TURN OVER FOR THE NEXT QUESTION

QUESTION NINE

The graph shows the results of an experiment in which two filter feeders **X** and **Y** were allowed to feed on plankton.



9.1 The graph suggests that the filter feeders **X** and **Y** . . . . .

A both feed at the same rate.

B both feed more slowly as time passes.

C feed at different rates.

D only feed on plankton.

9.2 What was the rate of feeding of filter feeder **X**?

A 10 % per hour

B 22.5 % per hour

C 25 % per hour

D 90 % per hour

9.3 Filter feeders create a current of water using . . . . .

A cilia.

B gills.

C mouth parts.

D muscles.

9.4 Trapped plankton are moved towards the mouth by . . . . .

A cilia.

B gills.

C muscles.

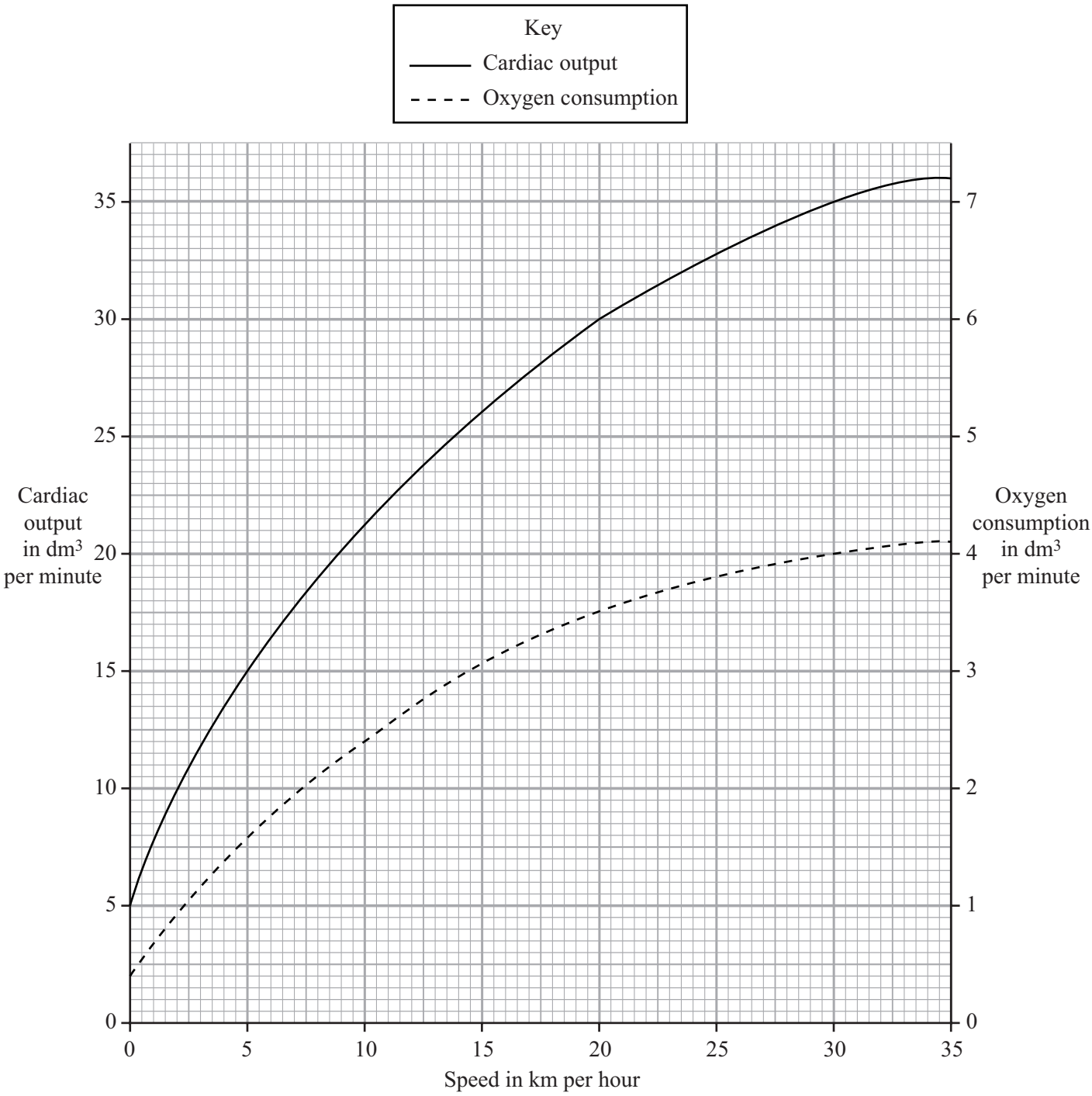
D the feeding current.

TURN OVER FOR THE NEXT QUESTION

QUESTION TEN

The graph shows some data collected while a student was exercising on a bicycle in a health club.
Readings were taken when the bicycle was operated at different speeds. The results are shown in the graph.

- Cardiac output is the volume of blood pumped by the heart each minute.
- Oxygen consumption is the volume of oxygen used by the student each minute.



10.1 What was the student's oxygen consumption when exercising on the bicycle at 30 km per hour?

A 4 dm^3 per minute

B 7 dm^3 per minute

C 20 dm^3 per minute

D 34 dm^3 per minute

10.2 At 5 km per hour, the cardiac output was 15 dm^3 per minute.

By how much did the speed have to increase for the cardiac output to double?

A 6 km per hour

B 15 km per hour

C 20 km per hour

D 30 km per hour

10.3 During exercise the cardiac output rises.

This is to . . . . .

A increase oxygen supply to muscles.

B prevent muscle cramp.

C reduce the blood flow to other areas.

D warm the leg muscles.

10.4 The oxygen carried to the muscles . . . . .

A gives up energy in the muscles.

B reacts with glucose to release energy.

C removes carbon dioxide from the muscles.

D stimulates the muscle fibres to contract.

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

Exercise helps to keep the body healthy.

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

smooth

stiff

strong

tensed

Regular exercise keeps muscle fibres slightly . . . . . **1** . . . . . .

It also keeps the muscles . . . . . **2** . . . . . and prevents them from feeling . . . . . **3** . . . . . after exercise.

Exercise also helps to keep movement at joints . . . . . **4** . . . . . .

QUESTION TWO

The digestive system of a cow is shown in the diagram.

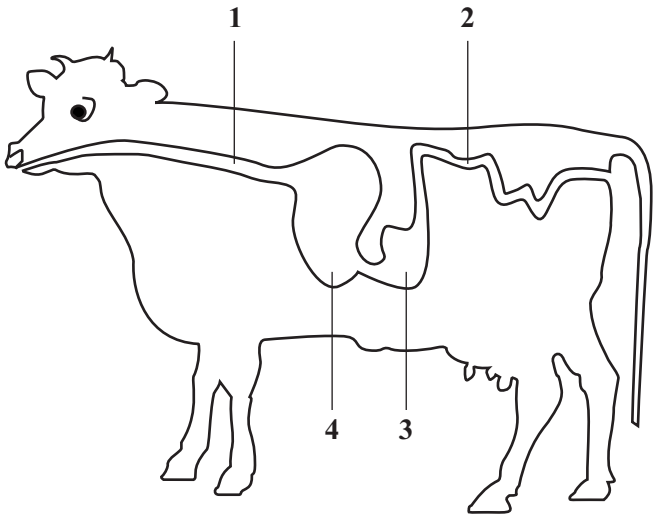
Match words from the list with the labels **1–4** on the diagram.

intestine

oesophagus

rumen

stomach



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.

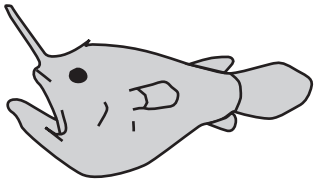
Mark your choices on the answer sheet.

QUESTION THREE

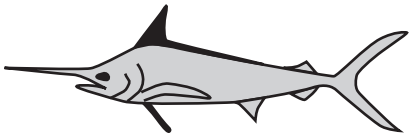
Fish are adapted for living in water in a variety of ways.

Which **two** of the following fish have bodies adapted for rapid movement through water?

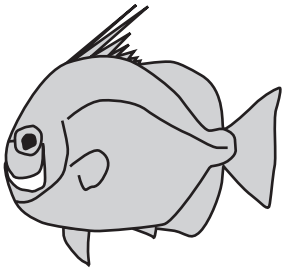
(The drawings are **not** to scale.)



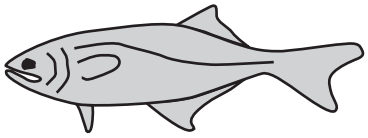
Angler fish



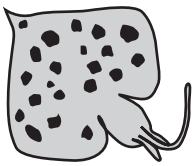
Billfish



Batfish



Salmon



Smooth skate

QUESTION FOUR

Bones have to resist certain forces to support the body.

Which **two** of the following properties would prevent bones from doing this job?

brittleness

flexibility

hardness

resistance to compression

tensile strength

NO QUESTIONS APPEAR ON THIS PAGE

TURN OVER FOR THE NEXT QUESTION

SECTION C

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

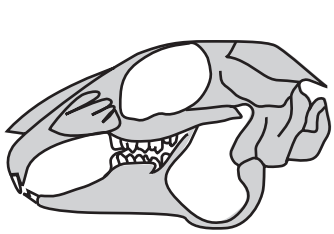
Each of these questions has four parts.

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

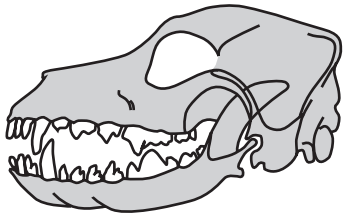
Mark your choices on the answer sheet.

QUESTION FIVE

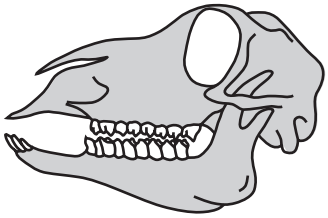
The drawings show the skulls of four mammals. (The drawings are **not** to scale.)



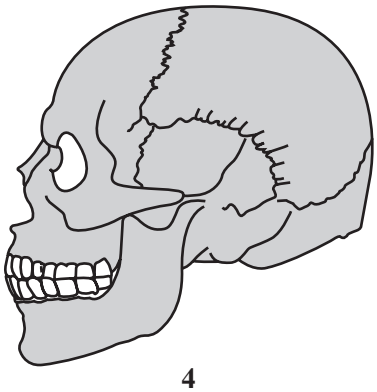
1



2



3



4

5.1 Which **two** of the skulls have canine teeth?

A **1** and **2**

B **1** and **3**

C **2** and **4**

D **3** and **4**

5.2 Which skull has specially adapted teeth for crushing bones?

A **1**

B **2**

C **3**

D **4**

5.3 Which **two** skulls have a space in the dentition?

A **1** and **2**

B **1** and **3**

C **2** and **4**

D **3** and **4**

5.4 Which **two** of the mammals are most likely to feed by biting off small pieces of plant food and moving them to the back of the mouth to be chewed?

A **1** and **2**

B **1** and **3**

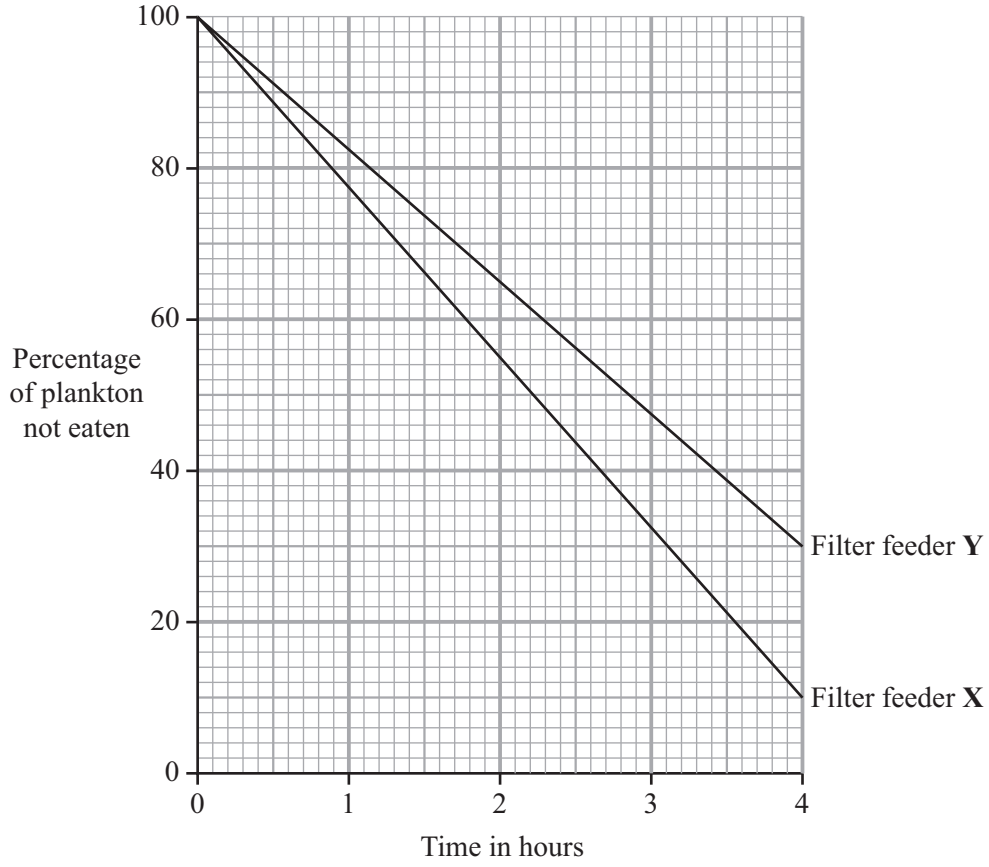
C **2** and **3**

D **2** and **4**

TURN OVER FOR THE NEXT QUESTION

QUESTION SIX

The graph shows the results of an experiment in which two filter feeders **X** and **Y** were allowed to feed on plankton.



6.1 The graph suggests that the filter feeders **X** and **Y** . . . . .

A both feed at the same rate.

B both feed more slowly as time passes.

C feed at different rates.

D only feed on plankton.

6.2 What was the rate of feeding of filter feeder **X**?

A 10 % per hour

B 22.5 % per hour

C 25 % per hour

D 90 % per hour

6.3 Filter feeders create a current of water using . . . . .

A cilia.

B gills.

C mouth parts.

D muscles.

6.4 Trapped plankton are moved towards the mouth by . . . . .

A cilia.

B gills.

C muscles.

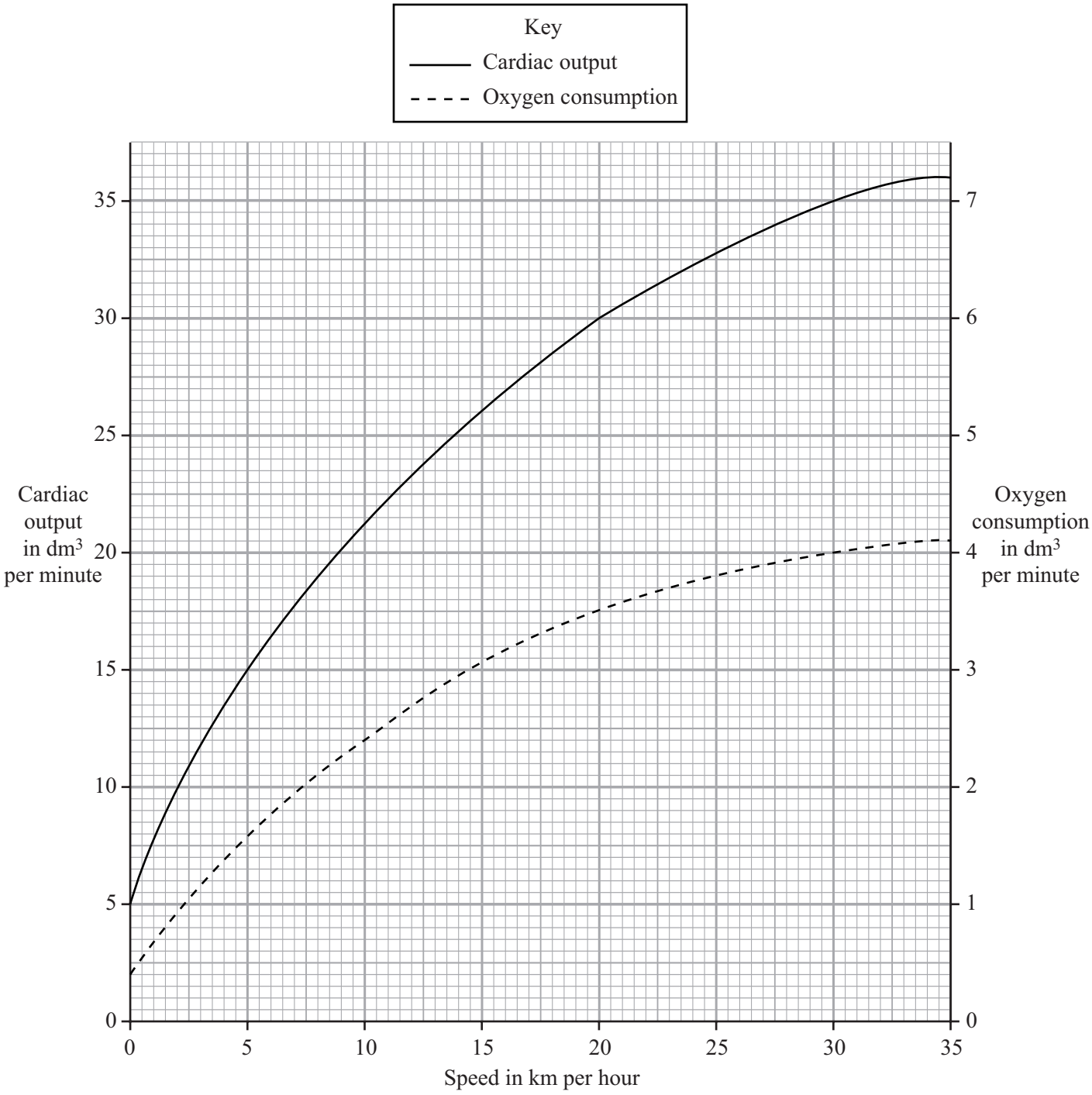
D the feeding current.

TURN OVER FOR THE NEXT QUESTION

QUESTION SEVEN

The graph shows some data collected while a student was exercising on a bicycle in a health club.
Readings were taken when the bicycle was operated at different speeds. The results are shown in the graph.

- Cardiac output is the volume of blood pumped by the heart each minute.
- Oxygen consumption is the volume of oxygen used by the student each minute.



7.1 What was the student's oxygen consumption when exercising on the bicycle at 30 km per hour?

A 4 dm^3 per minute

B 7 dm^3 per minute

C 20 dm^3 per minute

D 34 dm^3 per minute

7.2 At 5 km per hour, the cardiac output was 15 dm^3 per minute.

By how much did the speed have to increase for the cardiac output to double?

A 6 km per hour

B 15 km per hour

C 20 km per hour

D 30 km per hour

7.3 During exercise the cardiac output rises.

This is to . . . . .

A increase oxygen supply to muscles.

B prevent muscle cramp.

C reduce the blood flow to other areas.

D warm the leg muscles.

7.4 The oxygen carried to the muscles . . . . .

A gives up energy in the muscles.

B reacts with glucose to release energy.

C removes carbon dioxide from the muscles.

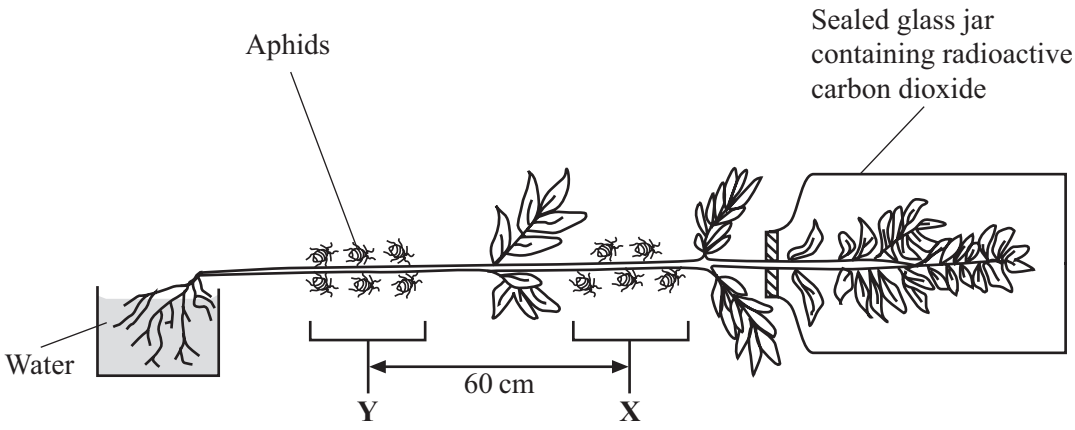
D stimulates the muscle fibres to contract.

QUESTION EIGHT

Aphids feed by sucking sugar from plant stems. They suck up so much sugar that some of it is excreted before it can be absorbed by their gut. This knowledge can be used to measure the speed at which sugars are transported from plant leaves to the roots.

The diagram shows the apparatus that is used to measure the speed of the sugar movement.

Radioactive carbon dioxide given to plant leaves is used to make radioactive sugars. The sugars are excreted by aphids and collected in dishes.



8.1 Radioactive sugar started to appear at point **X** at 14:00 hours and at point **Y** at 14:36 hours.

What was the speed of sugar movement?

A 36 cm per minute

B 36 cm per hour

C 100 cm per minute

D 100 cm per hour

8.2 Which of the following is a feature of the feeding relationship between the aphid and the plant?

A Both organisms provide food for each other

B Both organisms receive benefit from living together

C The aphid feeds as a carnivore on the plant

D The aphid feeds as a parasite on the plant

8.3 Which type of animal feeds in a similar way to aphids?

A Malarial parasite

B Mammal

C Mosquito

D Mussel

8.4 What do aphids use to obtain the sugar from the plant?

A Cilia

B Gills

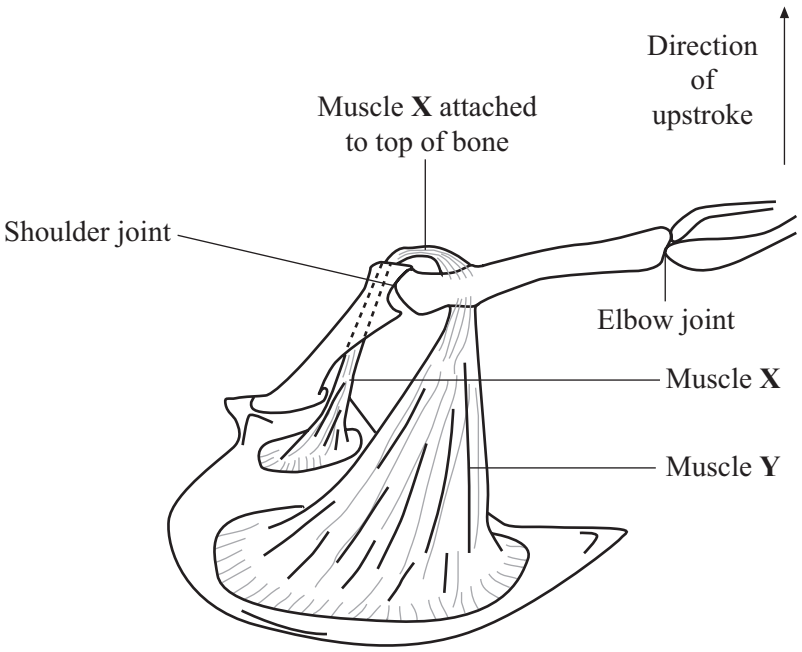
C Proboscis

D Teeth

TURN OVER FOR THE NEXT QUESTION

QUESTION NINE

The diagram shows two of the muscles attached to a bird's wing.



9.1 For the upstroke to occur . . . . .

A muscle **X** and muscle **Y** both contract.

B muscle **X** and muscle **Y** both relax.

C muscle **X** contracts while muscle **Y** relaxes.

D muscle **X** relaxes while muscle **Y** contracts.

9.2 The wing muscles are attached to . . . . .

A the leg and the keel.

B the sternum and the hip bone.

C the sternum and the wing.

D the wrist bones and the sternum.

9.3 Which of the following is correct?

A The downstroke of the wing decreases lift and increases forward movement

B The downstroke of the wing increases both lift and forward movement

C The upstroke of the wing decreases both air resistance and weight

D The upstroke of the wing increases both air resistance and weight

9.4 The aerofoil shape of the wing leads to . . . . .

A decreased air resistance.

B decreased weight.

C increased forward speed.

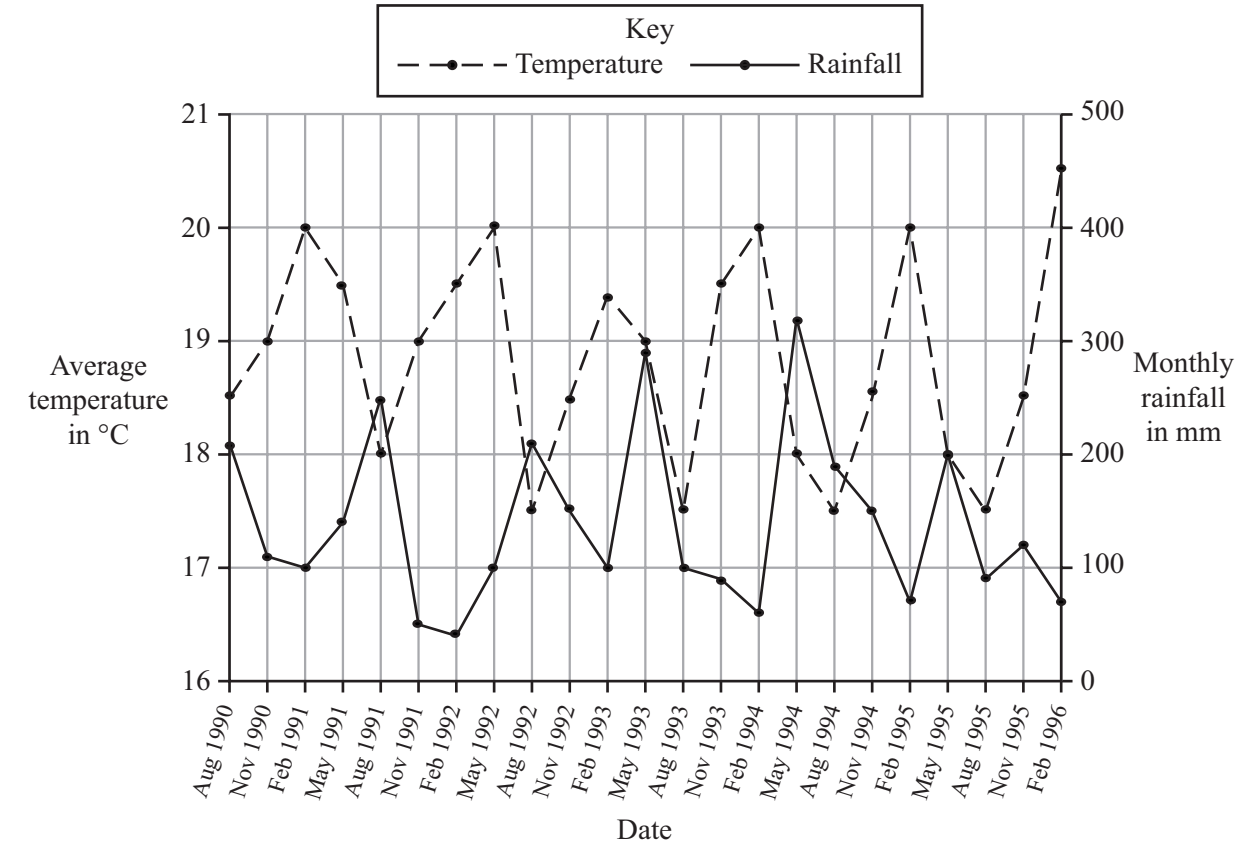
D increased lift.

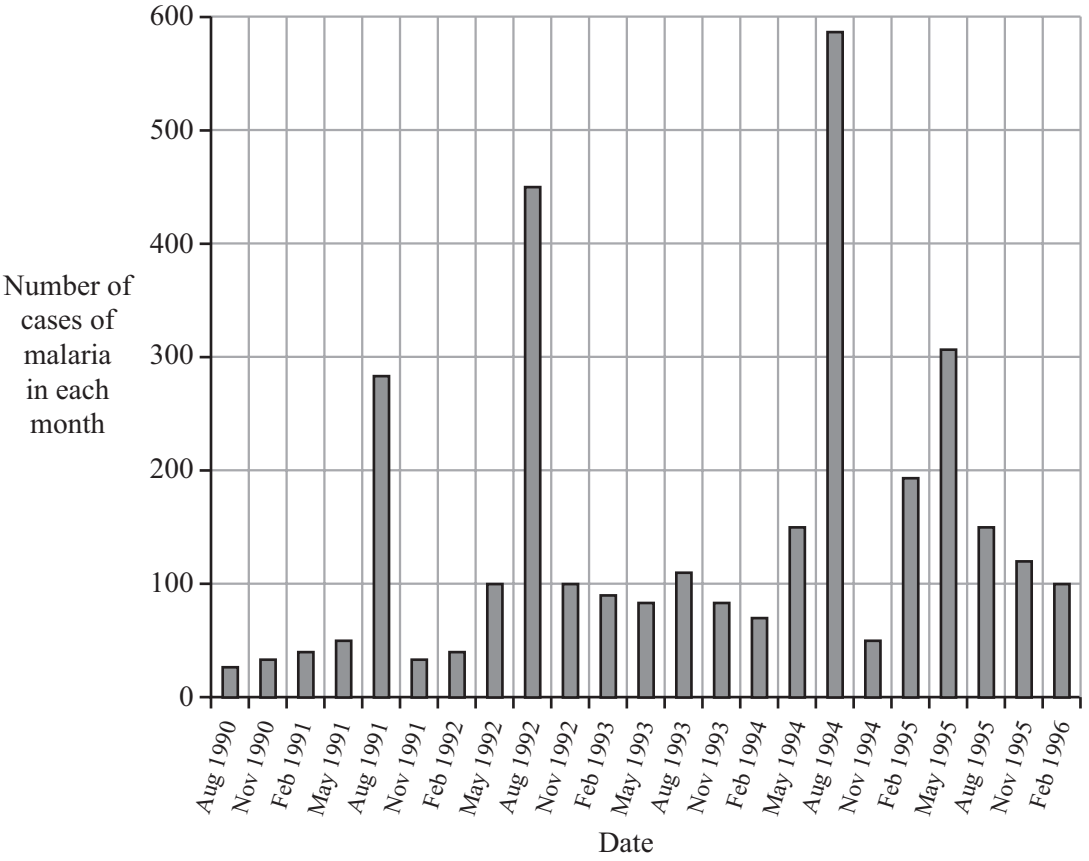
TURN OVER FOR THE NEXT QUESTION

QUESTION TEN

Malaria is caused by a parasite transmitted by mosquitoes.

The graphs show the monthly rainfall, average temperature and number of cases of malaria in part of Kenya from 1990 to 1996. Epidemics occur when the number of cases exceeds 250 in a month.





10.1 Which is true of these data?

A Epidemics only occur in August

B Epidemics occur when the average temperature is above 18 °C

C Low levels of malaria (below 100 cases) are associated with average temperatures below 18 °C and rainfall above 100 mm

D When epidemics occur, the rainfall is always above 170 mm

10.2 What is the most likely reason for collecting this data?

A To find out if mosquitoes cause malaria

B To find out if previous data on malaria cases affect current patterns of the disease

C To find out if there is a link between environmental conditions and levels of malaria

D To see how temperature affects rainfall

10.3 Uninfected mosquitoes can become infected with malarial parasites if they . . . . .

A mate with a mosquito carrying the parasite.

B suck saliva from the neck of an infected human.

C suck the blood of an infected human.

D suck the blood of an infected mosquito.

10.4 Bouts of high temperature (fevers) are a symptom of malaria.

What causes the fevers in a person suffering from malaria?

A Malarial parasites reproducing in red blood cells

B Mosquitoes piercing the skin and sucking blood from the capillaries

C Red blood cells rupturing and releasing malarial parasites into the blood

D Substances in mosquito saliva causing small blood clots in capillaries

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