

Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

General Certificate of Secondary Education
June 2004



BIOLOGY (MODULAR)
Moving and Feeding (Module 19)

346019

Tuesday 29 June 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 “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:

1	2	3	4
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

- Do **not** extend beyond the circles.

- If you want to change your answer, **you must** cross out your original answer, as shown:

1	2	3	4
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

- 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:

1	2	3	4
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

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 table is about the food eaten by different animals.

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

dog

human

mosquito

mussel

Animal	Food it eats
1	a wide range of foods
2	mainly blood
3	mainly meat
4	microscopic organisms

QUESTION TWO

The diagram shows the lower jaw of a dog.

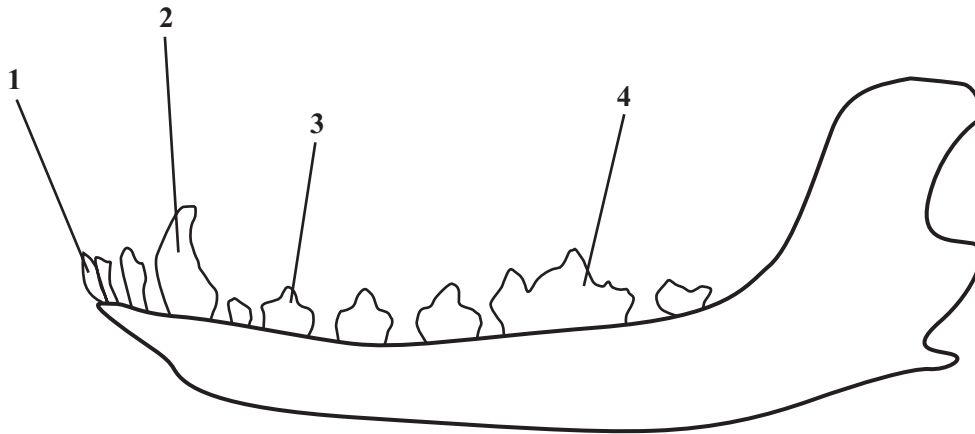
Match words from the list with the labels 1–4 on the diagram.

incisor tooth

canine tooth

carnassial tooth

premolar tooth



TURN OVER FOR THE NEXT QUESTION

Turn over ►

QUESTION THREE

The diagram shows a joint.

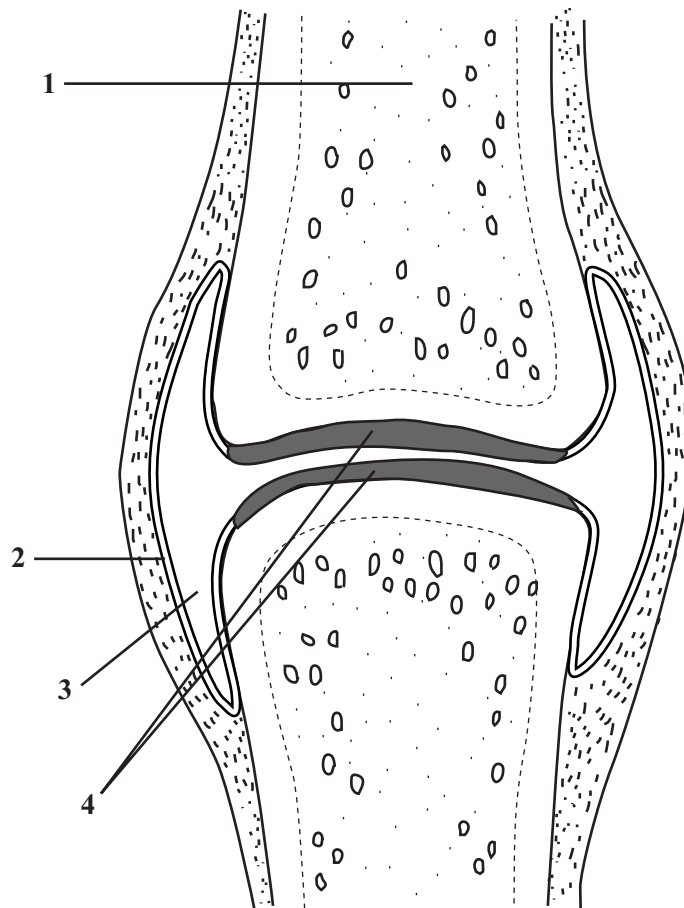
Match words from the list with the labels 1–4 on the diagram.

bone

cartilage

joint membrane

synovial fluid



QUESTION FOUR

Dogs feed using their jaws and teeth which are adapted for a carnivorous diet.

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

canine teeth

carnassial teeth

incisor teeth

muscle

Structure	Function
1	used to crush bones
2	used to grip prey
3	it shortens to close up the jaw
4	used to pull meat apart

QUESTION FIVE

A man is going to take part in a 10 km charity fun run.
He decides to train for the run by doing regular exercise.

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

contract

sprain

stiffen

strengthen

Regular exercise before the race will help to **1** his muscles.

Regular exercise also keeps muscle fibres ready to **2**

If he takes part in the run, without regular exercise beforehand, his muscles are likely to **3** afterwards.

If he slips and twists his ankle during the run, he could **4** his ankle ligaments.

Turn over ►

SECTION BQuestions **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

Birds are adapted to fly.

Which **two** of the following are adaptations for flight?**a streamlined body shape****a tail with a large surface area****cilia beating to produce a current of air****honeycombed bones****zig-zag muscles in the wings**

QUESTION SEVEN

Cows eat mainly grass. The drawing shows the skull of a cow.
Some types of tooth are absent from the upper jaw.

Which **two** of the following types of tooth are present in the cow's upper jaw?

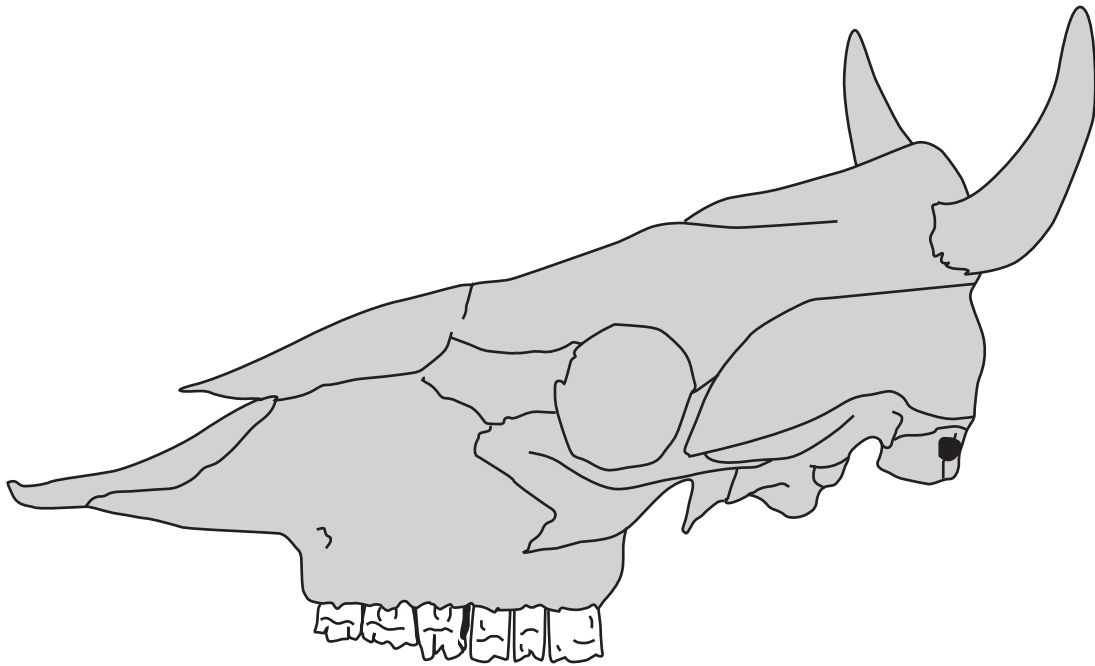
canine

carnassial

incisor

molar

premolar



TURN OVER FOR THE NEXT QUESTION

Turn over ►

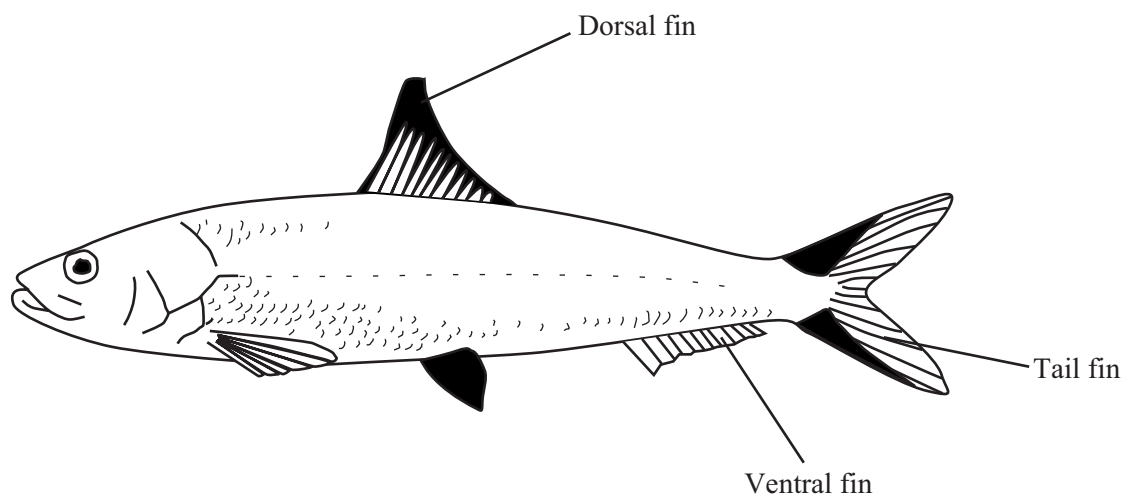
SECTION CQuestions **EIGHT** to **TEN**.

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 a fish.



- 8.1** In fish, the forward movement through the water is brought about by the
- A** contraction of muscles.
 - B** dorsal fin.
 - C** streamlined body shape.
 - D** ventral fin.

- 8.2** To move the fish forwards in the water, the tail fin
- A contains zig-zag muscles.
 - B has an aerofoil shape.
 - C moves up and down.
 - D pushes backwards against the water.
- 8.3** The resistance to movement through the water is most likely to be reduced by
- A a streamlined body shape.
 - B a strong and light tail fin.
 - C a zig-zag arrangement of muscles.
 - D light honeycombed bones.
- 8.4** Energy is needed for movement through the water. This is provided by the
- A removal of carbon dioxide.
 - B respiration of glucose.
 - C surrounding water.
 - D uptake of oxygen.

TURN OVER FOR THE NEXT QUESTION

Turn over ►

QUESTION NINE

The table shows changes in the action of the heart before and during exercise.

Activity	Heart rate in beats per minute	Volume of blood leaving the heart during each beat in cm³	Volume of blood leaving the heart during one minute in cm³
At rest	70	65	4550
During gentle exercise	85	90	X
During vigorous exercise	120	115	13 800

9.1 The difference between the volume of blood leaving the heart during one minute while at rest and that during vigorous exercise is

- A 50 cm³
- B 6150 cm³
- C 9250 cm³
- D 13 800 cm³

9.2 The volume of blood (**X**) leaving the heart in one minute during gentle exercise is

- A 85 cm³
- B 175 cm³
- C 7650 cm³
- D 12 200 cm³

9.3 Much of the increased blood flow from the heart during exercise passes through the muscles.

This increase in blood flow

- A increases muscle strength.
- B provides muscles with more carbon dioxide.
- C removes heat from muscles.
- D removes glucose from muscles.

9.4 The blood carries oxygen to the muscles for use in

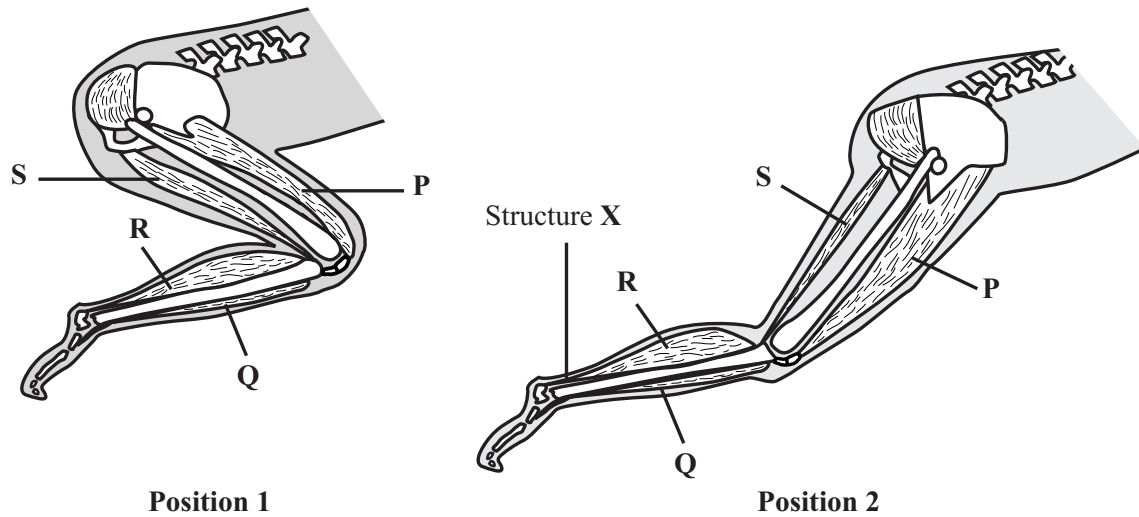
- A digestion.
- B feeding.
- C filtering.
- D respiration.

TURN OVER FOR THE NEXT QUESTION

Turn over ►

QUESTION TEN

The diagrams show some of the bones and some of the muscles in the leg of an athlete as she leaves the starting blocks.



10.1 Which muscle contracts to bring about the change from **Position 1** to **Position 2**?

- A P
- B Q
- C R
- D S

10.2 The joints in the leg move smoothly because they have

- A bones and cartilage.
- B cartilage and synovial fluid.
- C ligaments and synovial fluid.
- D ligaments and joint membranes.

10.3 A function of ligaments is to

- A** attach muscles to bones.
- B** prevent dislocations.
- C** keep a joint toned.
- D** reduce the risk of sprains.

10.4 Structure **X** attaches muscle **R** to the foot.

What will be the effect on the athlete if structure **X** snaps?

- A** The foot cannot be placed flat on the ground
- B** The heel cannot be raised
- C** The leg will not bend at the knee
- D** The leg cannot swing forward

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

A man is going to take part in a 10 km charity fun run.
He decides to train for the run by doing regular exercise.

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

contract

sprain

stiffen

strengthen

Regular exercise before the race will help to **1** his muscles.

Regular exercise also keeps muscle fibres ready to **2**

If he takes part in the run, without regular exercise beforehand, his muscles are likely to **3** afterwards.

If he slips and twists his ankle during the run, he could **4** his ankle ligaments.

QUESTION TWO

Birds are adapted for flight.

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

bones

flight feathers

flight muscles

wings

Part	Feature
1	are attached to the rigid framework provided by the sternum and keel
2	are honeycombed inside to reduce mass whilst keeping strength
3	have fewer digits than a human arm
4	have interlocking barbs

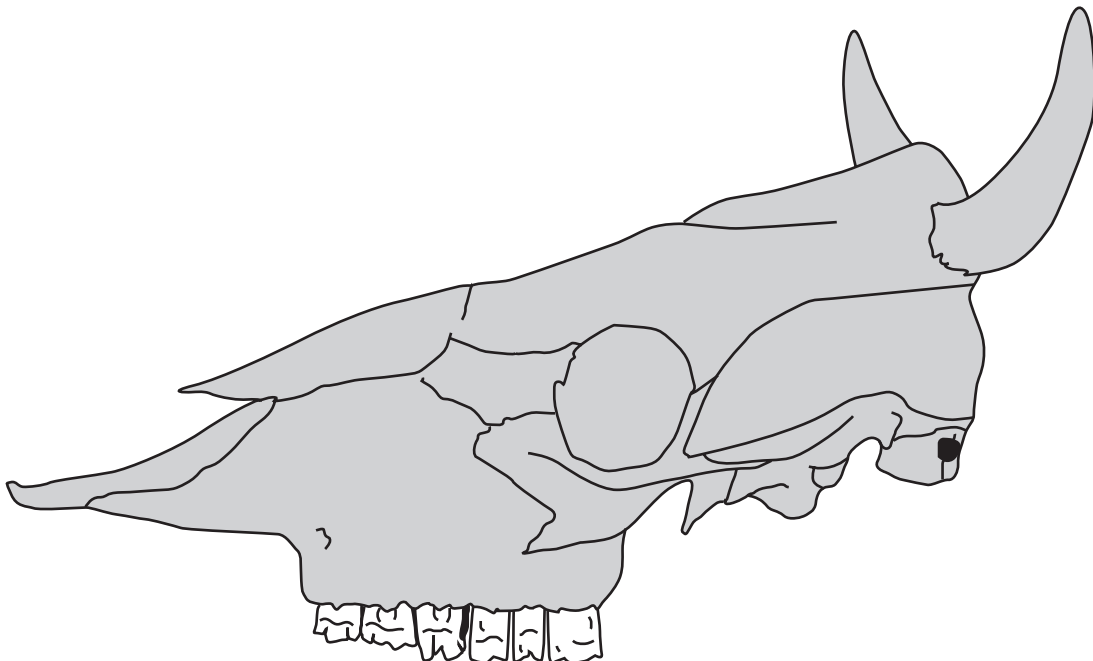
TURN OVER FOR THE NEXT QUESTION

Turn over ►

SECTION BQuestions **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

Cows eat mainly grass. The drawing shows the skull of a cow.
Some types of tooth are absent from the upper jaw.

Which **two** of the following types of tooth are present in the cow's upper jaw?**canine****carnassial****incisor****molar****premolar**

QUESTION FOUR

Lift is needed for birds to fly.

Which **two** of the following features directly provide lift?

a large sternum and keel

the smooth surface of the flight feathers

hollow shafts in the feathers

the aerofoil shape of the wing

the overlapping of the primary and secondary flight feathers

TURN OVER FOR THE NEXT QUESTION

Turn over ►

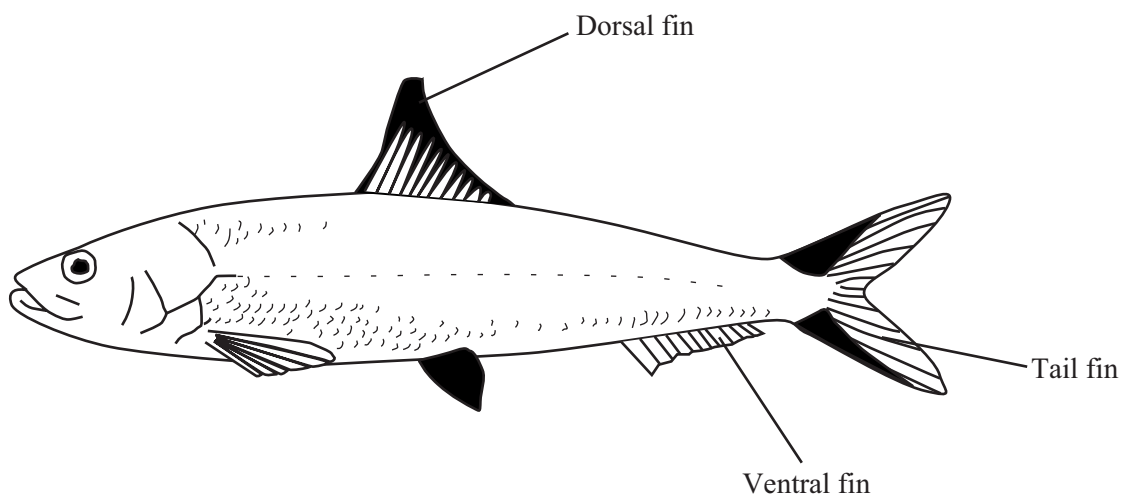
SECTION CQuestions **FIVE** to **TEN**.

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 a fish.



- 5.1** In fish, the forward movement through the water is brought about by the
- A** contraction of muscles.
 - B** dorsal fin.
 - C** streamlined body shape.
 - D** ventral fin.

- 5.2** To move the fish forwards in the water, the tail fin
- A** contains zig-zag muscles.
 - B** has an aerofoil shape.
 - C** moves up and down.
 - D** pushes backwards against the water.
- 5.3** The resistance to movement through the water is most likely to be reduced by
- A** a streamlined body shape.
 - B** a strong and light tail fin.
 - C** a zig-zag arrangement of muscles.
 - D** light honeycombed bones.
- 5.4** Energy is needed for movement through the water. This is provided by the
- A** removal of carbon dioxide.
 - B** respiration of glucose.
 - C** surrounding water.
 - D** uptake of oxygen.

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- 6.3** Much of the increased blood flow from the heart during exercise passes through the muscles.
- This increase in blood flow
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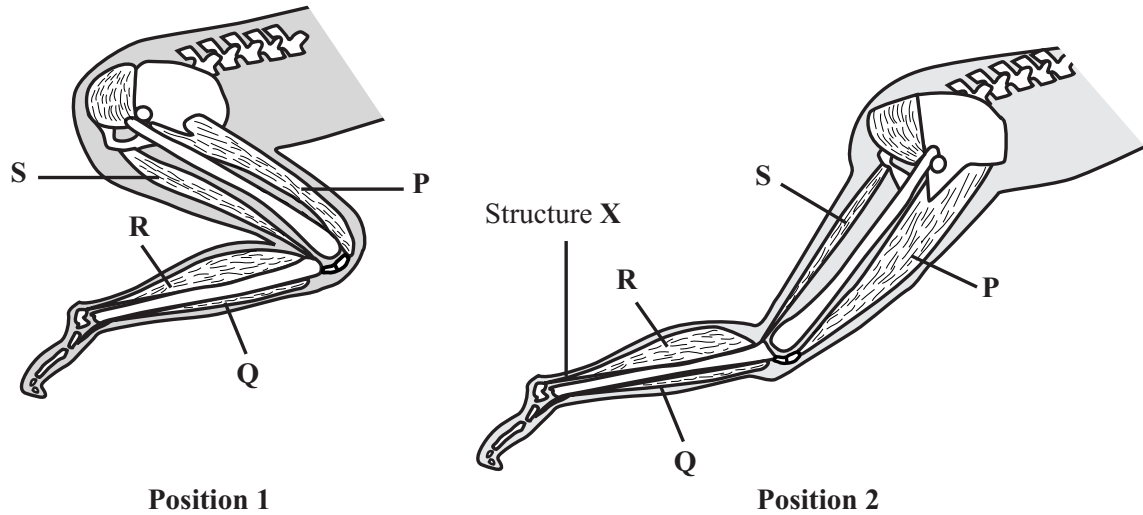
- A digestion.
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TURN OVER FOR THE NEXT QUESTION

Turn over ►

QUESTION SEVEN

The diagrams show some of the bones and muscles in the leg of an athlete as she leaves the starting blocks.



7.1 Which muscle contracts to bring about the change from **Position 1** to **Position 2**?

- A P
- B Q
- C R
- D S

7.2 The joints in the leg move smoothly because they have

- A bones and cartilage.
- B cartilage and synovial fluid.
- C ligaments and synovial fluid.
- D ligaments and joint membranes.

7.3 A function of ligaments is to

- A** attach muscles to bones.
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7.4 Structure **X** attaches muscle **R** to the foot.

What will be the effect on the athlete if structure **X** snaps?

- A** The foot cannot be placed flat on the ground
- B** The heel cannot be raised
- C** The leg will not bend at the knee
- D** The leg cannot swing forward

TURN OVER FOR THE NEXT QUESTION

Turn over ►

QUESTION EIGHT

The table shows a food source for four different insects.

Insect	Food source
Aphid	Soluble substances in plant sap
Butterfly	Sugars in nectar from open flowers
Housefly	Meat
Mosquito	Human blood

8.1 Which method of feeding is used by all four insects?

- A Carnivorous
- B Filter feeding
- C Parasitic
- D Sucking fluids

8.2 Which insects are most likely to have sharp mouthparts?

- A Aphid and butterfly
- B Aphid and mosquito
- C Housefly and butterfly
- D Housefly and mosquito

8.3 Which insect is most likely to secrete digestive enzymes onto its food before it takes the food into its mouth?

- A Aphid
- B Butterfly
- C Housefly
- D Mosquito

8.4 Which insect transmits parasites directly into the human body?

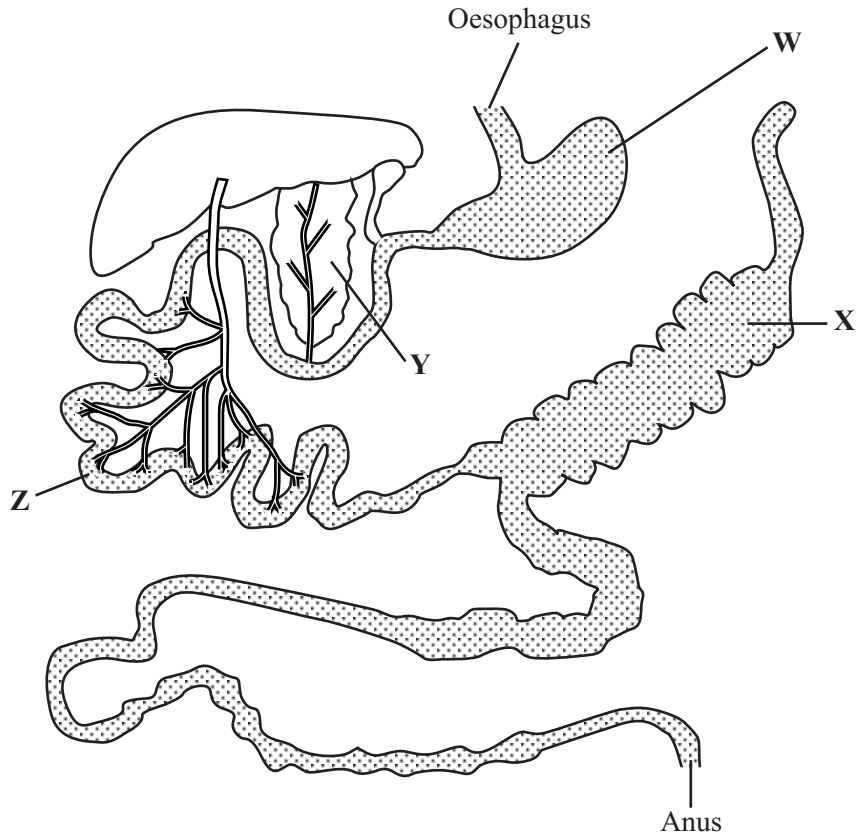
- A Aphid
- B Butterfly
- C Housefly
- D Mosquito

TURN OVER FOR THE NEXT QUESTION

Turn over ►

QUESTION NINE

The diagram shows part of the digestive system of a rabbit.



9.1 The digestive system of a rabbit is adapted to a

- A** carnassial diet.
- B** carnivorous diet.
- C** filter feeding diet.
- D** herbivorous diet.

- 9.2** The cellulose in a rabbit's food is broken down into
- A** amino acids.
 - B** fatty acids.
 - C** sugars.
 - D** glycerol.
- 9.3** Much of the cellulose is broken down by bacteria found in
- A** W
 - B** X
 - C** Y
 - D** Z
- 9.4** The relationship between the rabbit and these bacteria is called mutualism.
- This is because the
- A** bacteria are kept at a constant temperature.
 - B** bacteria get a supply of cellulose from the rabbit.
 - C** rabbit and bacteria depend on each other for food.
 - D** rabbit gets its digested food from the bacteria.

TURN OVER FOR THE NEXT QUESTION

Turn over ►

QUESTION TEN

Skeletal tissues have a variety of properties.

10.1 Which of these mineral salts is found as deposits in the skeleton?

- A Calcium chloride
- B Calcium phosphate
- C Sodium chloride
- D Sodium phosphate

10.2 Which tissue functions as a shock absorber?

- A Cartilage
- B Ligament
- C Muscle
- D Tendon

10.3 Which tissue resists both compression and stretching?

- A Bone
- B Cartilage
- C Ligament
- D Tendon

10.4 Bone is prevented from being brittle by

- A carbohydrates.
- B lipids.
- C muscle fibres.
- D protein.

END OF TEST