

Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

General Certificate of Secondary Education
March 2006



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

346019

Wednesday 8 March 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

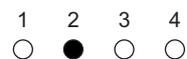
Instructions

- 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 14 of this booklet.

FOUNDATION TIER

SECTION A

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

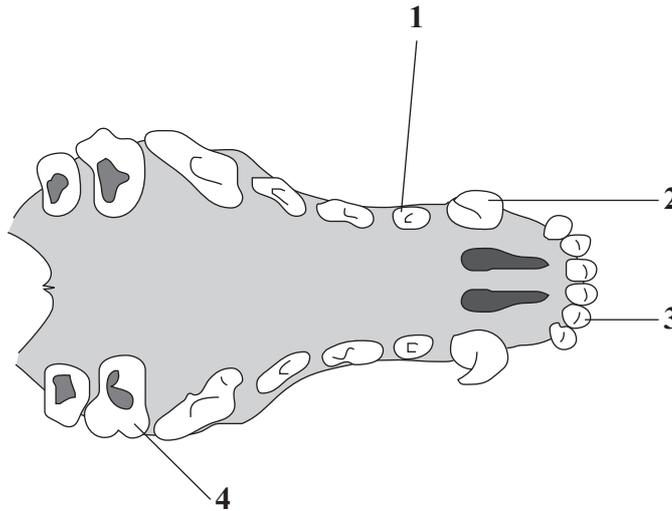
In these questions match words in the list with the numbers.

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

Mark your choices on the answer sheet.

QUESTION ONE

The drawing shows the lower jaw of a brown fox.



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

canine tooth

incisor tooth

molar tooth

premolar tooth

QUESTION TWO

Bones form the skeleton of the body.

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

cartilage

ligaments

muscles

synovial fluid

Bones are held together at a joint by . . . **1**

The ends of bones are covered with . . . **2** . . . that is kept slippery by . . . **3**

Bones are moved by the contraction of . . . **4**

QUESTION THREE

Mussels are shellfish that live in the sea.

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

cilia

filter feeders

gills

plankton

Mussels are . . . **1**

They feed by removing small organisms called . . . **2** . . . from a current of water.

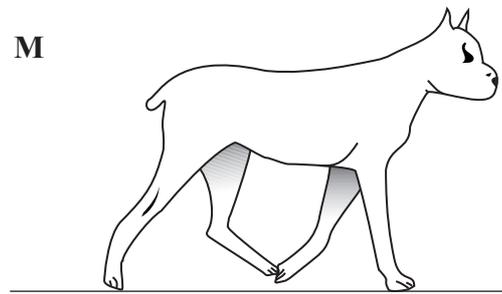
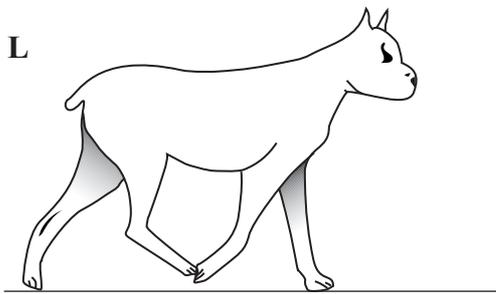
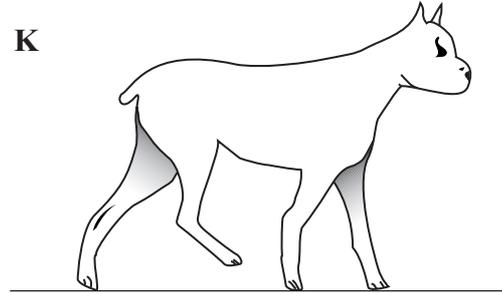
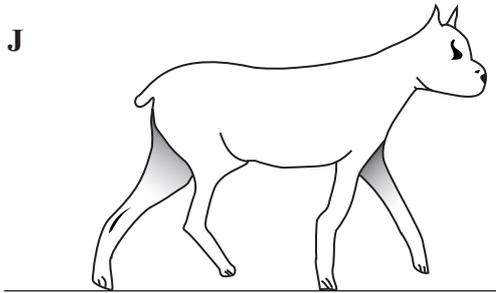
This water current is maintained by the beating of . . . **3**

Mussels also have . . . **4** . . . that help to trap these organisms.

Turn over ►

QUESTION FOUR

The diagrams show stages in a dog walking.



Match diagrams **J**, **K**, **L** and **M** with the numbers **1–4** in the table.

Stage of walk	Description of stage of walk
1	both left legs off the ground
2	both right legs off the ground
3	front left leg and back right leg off the ground
4	only right back leg off the ground

QUESTION FIVE

Female mosquitoes feed on humans.

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

blood

muscles

proboscis

saliva

Structure or substance	Role in feeding
1	keeps the food liquid
2	is the food of the mosquito
3	penetrates the skin
4	suck up the food

Turn over for the next question

Turn over ►

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 are benefits which may be obtained from taking regular, controlled exercise?

it can cause sprains

it improves muscle tone

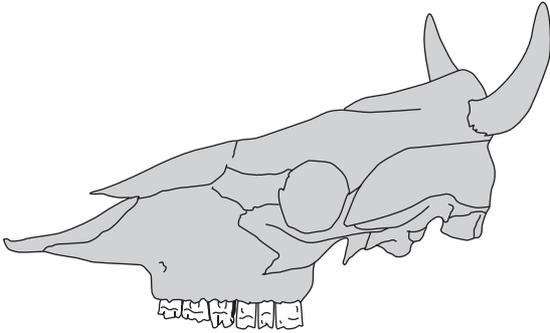
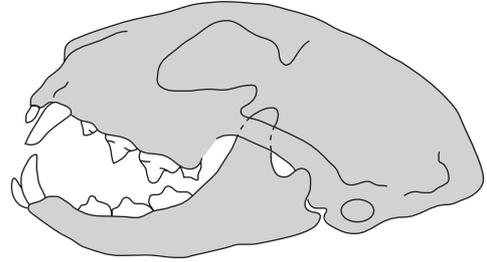
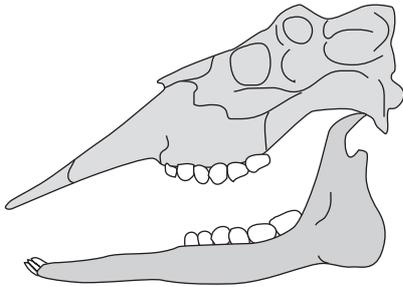
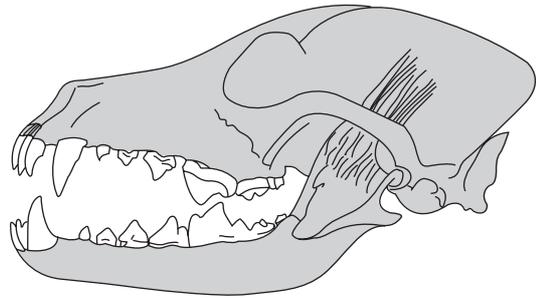
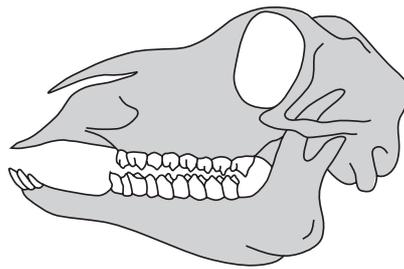
it increases the amount of synovial fluid in the joint

it keeps joints moving smoothly

it reduces the blood supply to muscle, heart and lungs

QUESTION SEVEN

Which **two** of the following skulls have teeth adapted for a carnivorous diet?

**P****Q****R****S****T****Turn over ►**

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

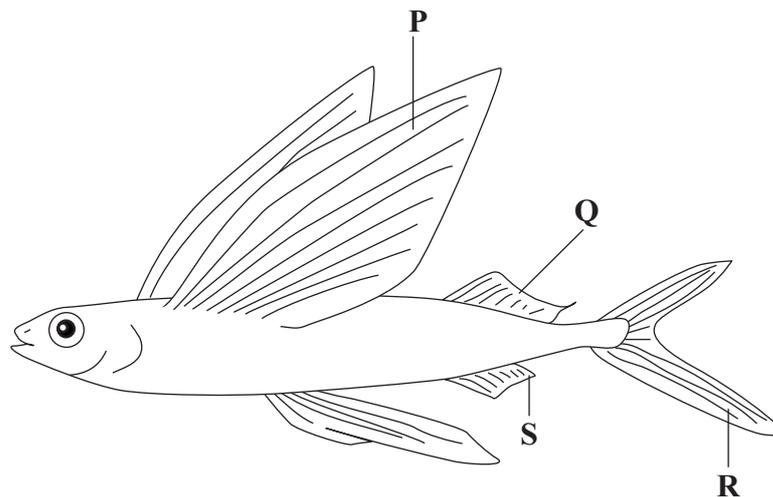
Each of these questions has four parts.

In each part choose only **one** answer.Mark your choices on the answer sheet.

QUESTION EIGHT

Flying fish are able to swim fast close to the surface of the water. They can then jump out of the water and glide in the air for 100 metres.

The diagram shows a flying fish.



8.1 The flying fish can swim fast enough to get into the air because it has . . .

- A** a small tail fin.
- B** honey-combed bones.
- C** large gills.
- D** powerful muscles.

8.2 Which factor reduces the resistance to movement of the fish in both air and water?

- A A streamlined body shape
- B A tail fin with a large surface area
- C Light honey-combed bones
- D Powerful zig-zag muscles

8.3 When the fish is out of the water, which fin is most likely to provide the lift needed?

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

8.4 Birds flap their wings to provide lift.

How does the wing move when lift is produced?

- A Both upwards and downwards
- B Downwards only
- C From side to side
- D Upwards only

Turn over for the next question

Turn over ►

QUESTION NINE

The table shows the number of wing beats per second for different birds.

Bird	Size in centimetres	Wing beats per second
Raven	65	2
Robin	14	2
Eagle	86	3
Pigeon	33	3
Owl	68	4
Starling	27	5
Kestrel	34	8
Chickadee	13	27
Hummingbird	9	70

- 9.1** Hummingbirds feed by hovering and collecting nectar from flowers. Normally they hover for about 30 seconds.

How many wing beats would the hummingbird make in 30 seconds?

- A** 21
- B** 210
- C** 2 100
- D** 21 000
- 9.2** Which is true of these data?
- A** As the size of the bird increases, the number of wing beats per second increases.
- B** The four largest birds have fewer than 10 wing beats per second.
- C** The three smallest birds have more than 15 wing beats per second.
- D** The wing beat of a chickadee is four times faster than that of a kestrel.

9.3 The streamlined shape of a bird . . .

- A** increases the surface area of the bird.
- B** makes the bird more stable when flying.
- C** reduces friction with the air.
- D** reduces weight.

9.4 Bird bones are honey-combed to . . .

- A** allow air to pass through them.
- B** allow them to bend.
- C** increase the bird's speed when flying.
- D** make them light but strong.

Turn over for the next question

Turn over ►

QUESTION TEN

The table shows the effect on breathing of running at different speeds.

Speed in kilometres per hour	Number of breaths per minute	Volume of each breath in cm³	Total amount of air breathed in each minute in cm³
0	15	500	7 500
4	16	600	9 600
8	18	650	11 700
12	20	850	X
16	22	1100	24 200
20	26	1600	41 600
24	30	1900	57 000

10.1 What is the value of **X**?

- A** 425 cm³
- B** 1 600 cm³
- C** 1 700 cm³
- D** 17 000 cm³

10.2 What is the increase in the total volume of air breathed in per minute, when the speed increases from 4 km per hour to 16 km per hour?

- A** 1 460 cm³
- B** 14 600 cm³
- C** 16 700 cm³
- D** 38 400 cm³

10.3 20 % of the air breathed in is oxygen.

How much oxygen enters the lungs each minute when a person runs at a speed of 20 km per hour?

- A 2 080 cm³
- B 8 320 cm³
- C 20 800 cm³
- D 83 200 cm³

10.4 As speed increases, the muscles produce heat more quickly.

This is caused by . . .

- A an increase in muscle tone.
- B an increase in the rate of breathing.
- C an increase in the rate of respiration.
- D the muscles becoming tensed.

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

Female mosquitoes feed on humans.

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

blood

muscles

proboscis

saliva

Structure or substance	Role in feeding
1	keeps the food liquid
2	is the food of the mosquito
3	penetrates the skin
4	suck up the food

QUESTION TWO

The parts of a joint have special properties to help it to move.

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

cartilage

ligament

membrane

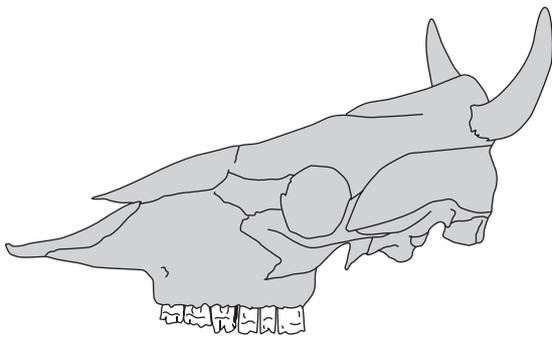
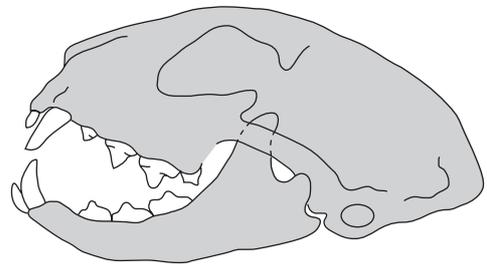
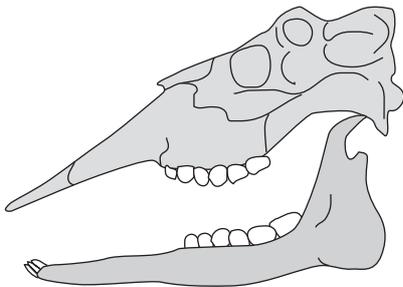
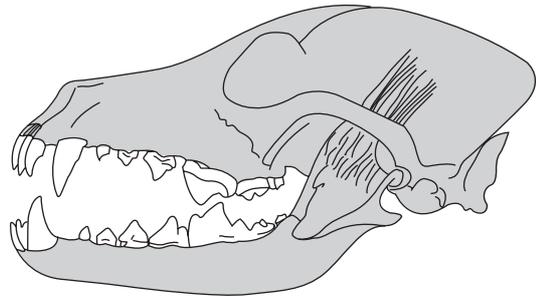
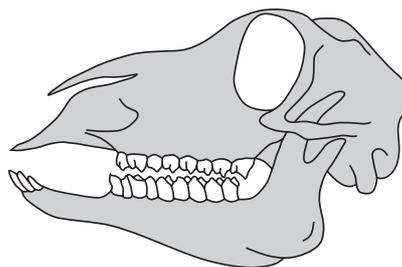
tendon

Part	Properties
1	can be slightly compressed to absorb shock
2	has tensile strength and some elasticity
3	has tensile strength, but does not stretch very much
4	secretes an oily fluid

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 THREEWhich **two** of the following skulls have teeth adapted for a carnivorous diet?**P****Q****R****S****T**

QUESTION FOUR

Mussels are filter feeders.

Which **two** of the following are features of filter feeding in mussels?

cilia that beat to produce a current

needle-like mouth parts

powerful throat muscles

sieve-like gills

the secretion of saliva

Turn over for the next question

Turn over ►

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

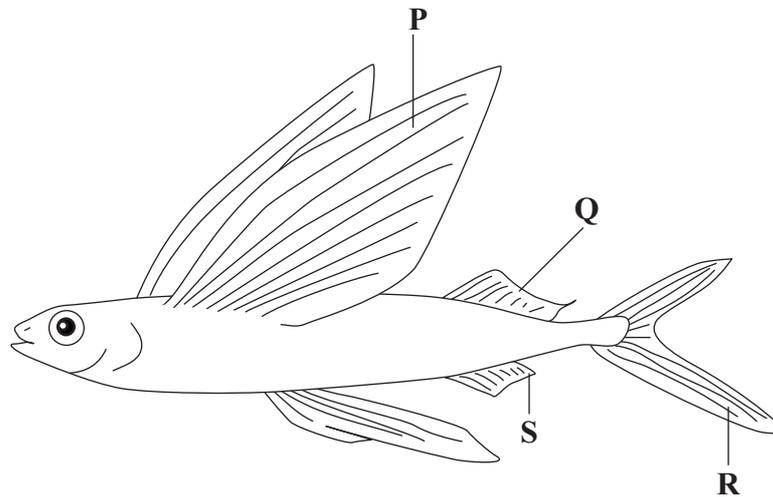
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- A** Fin **P**
- B** Fin **Q**
- C** Fin **R**
- D** Fin **S**

5.4 Birds flap their wings to provide lift.

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Turn over for the next question

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- C an increase in the rate of respiration.
- D the muscles becoming tensed.

Turn over for the next question

Turn over ►

QUESTION EIGHT

Rabbits eat plant material and their digestive system is adapted to this diet.

8.1 Bacteria in the digestive system of rabbits enable them to break down . . .

- A cellulose.
- B protein.
- C starch.
- D sugar.

8.2 Which part of the rabbit's digestive system contains most of these bacteria?

- A The caecum
- B The oesophagus
- C The rumen
- D The stomach

8.3 Rabbits eat their own faeces.

What is the advantage of this?

- A It allows nutrients released by the action of bacteria to be absorbed by the rabbit.
- B It allows the rabbit to feed in the safety of its burrow.
- C It keeps the jaw joints of the rabbit working smoothly.
- D It makes sure that bacteria are not lost from the digestive system of the rabbit.

8.4 The rabbit does not catch animals to eat. It has only three types of teeth.

Which type of teeth are most likely to be missing from a rabbit's jaw?

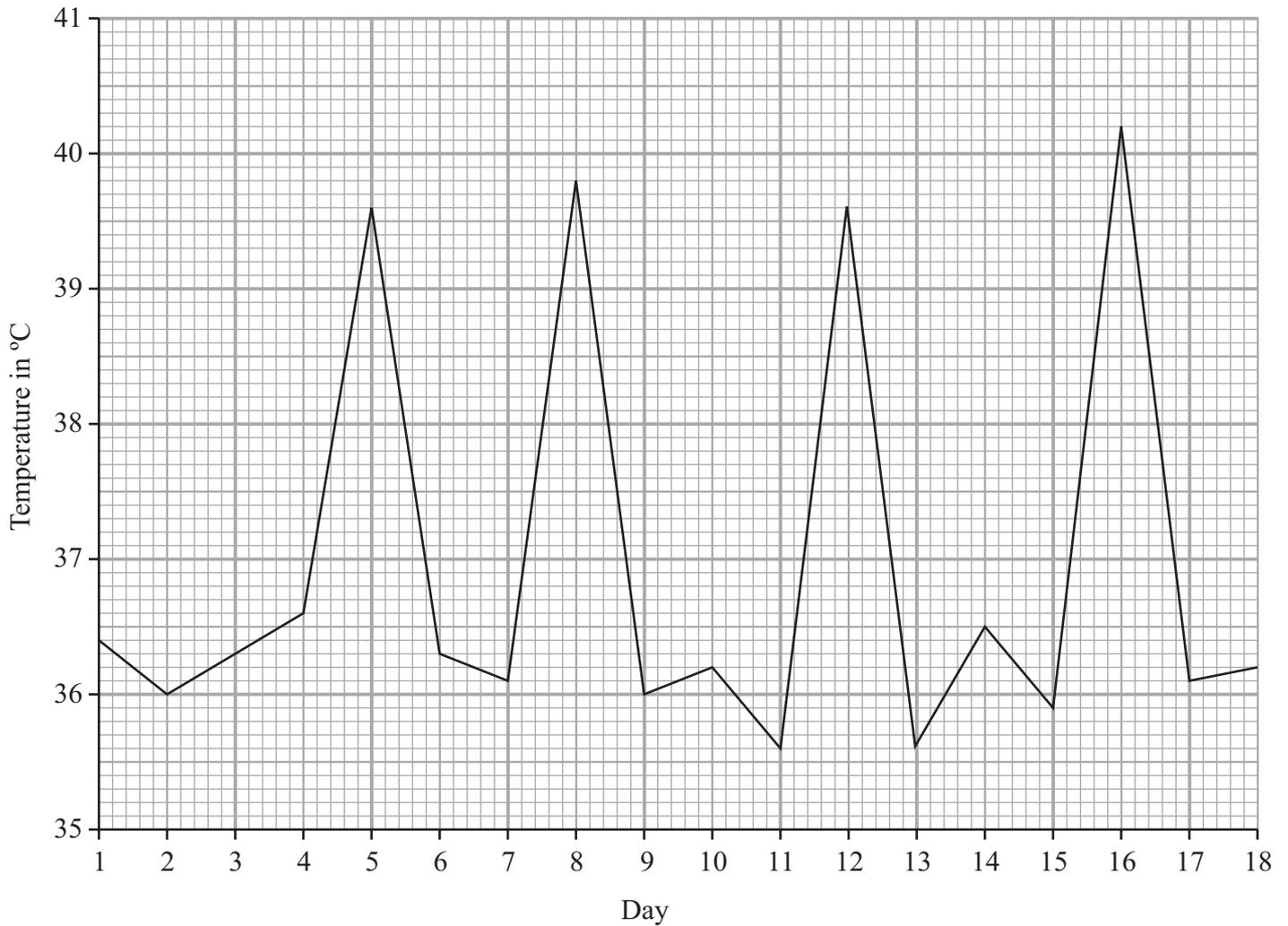
- A Canines
- B Incisors
- C Molars
- D Premolars

Turn over for the next question

Turn over ►

QUESTION NINE

The graph shows the body temperature of a person suffering from malaria.



9.1 What is the length of time between the two most severe fevers?

- A** 3 days
- B** 4 days
- C** 8 days
- D** 11 days

- 9.2** The greatest temperature change occurred between . . .
- A** day 8 and day 9.
 - B** day 11 and day 12.
 - C** day 15 and day 16.
 - D** day 16 and day 17.
- 9.3** Which of the following does a mosquito pass into humans as it feeds?
- A** Antibodies
 - B** Anti-clotting chemicals
 - C** Antitoxins
 - D** Red blood cells
- 9.4** The fevers are caused by . . .
- A** substances in the saliva of the mosquito.
 - B** the malarial parasite reproducing.
 - C** the rupture of liver cells releasing parasites.
 - D** the rupture of red blood cells releasing parasites.

Turn over for the next question

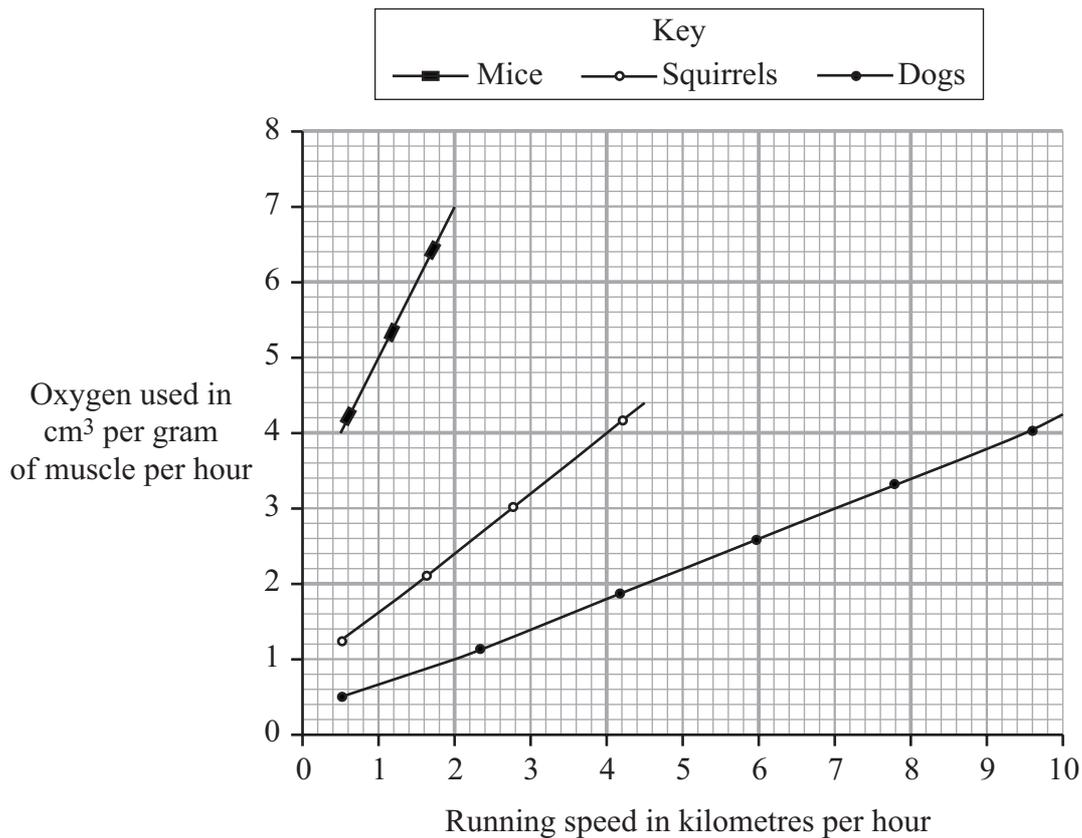
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QUESTION TEN

An investigation was carried out to determine the effect of running on the amount of oxygen used in the muscles of three species of animals: mice, squirrels and dogs.

The amount of oxygen used by the muscles was measured when the animals were running at different speeds.

The graph shows some of the results.



10.1 Which of the following is true of these data?

- A** Mice run faster than dogs.
- B** The measured running speed of mice has a range of 2.0 km per hour.
- C** When running at 2.0 km per hour, squirrels use 2.5 cm³ of oxygen per gram of muscle per hour.
- D** When running at 10 km per hour, dogs use more than 4 cm³ of oxygen per gram of muscle per hour.

10.2 This investigation shows that when animals run faster . . .

- A** the muscles contract more quickly.
- B** the muscles release more carbon dioxide.
- C** the muscles respire more rapidly.
- D** the muscles use more oxygen.

10.3 What is the role of tendons during muscle contraction?

- A** They act as shock absorbers.
- B** They attach the muscles to the bones.
- C** They prevent dislocation.
- D** They prevent the cartilage from being torn.

10.4 Which line in the table represents the composition of bone?

Key: ✓ = Present ✗ = Absent

	Living cells	Protein	Calcium phosphate
A	✓	✓	✓
B	✓	✗	✓
C	✓	✗	✗
D	✗	✓	✗

END OF TEST

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