

Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

General Certificate of Secondary Education
Spring 2005



BIOLOGY (MODULAR)
Moving and Feeding (Module 19)

346019

Wednesday 2 March 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 a human skull.

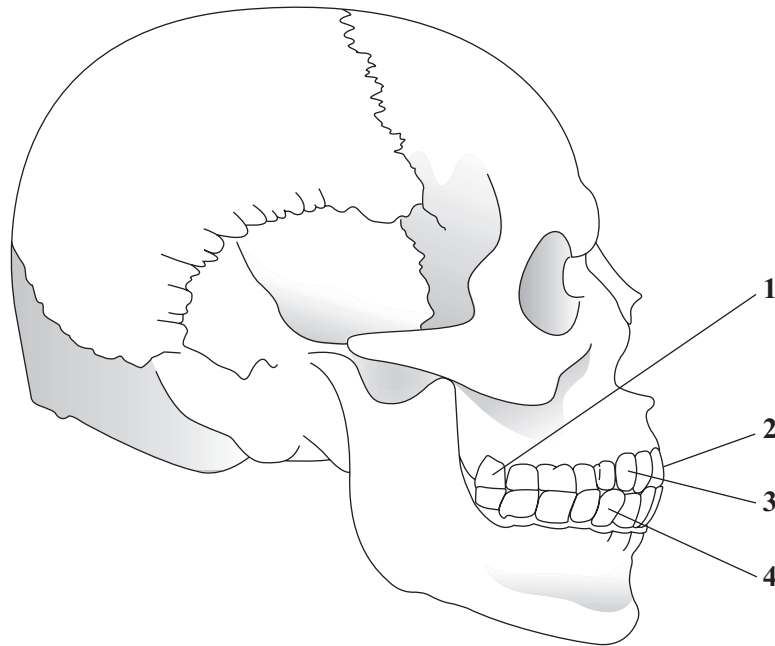
Match words from the list with the labels **1–4** on the drawing.

canine tooth

incisor tooth

molar tooth

premolar tooth



QUESTION TWO

Muscles respire to provide energy for contraction.

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

carbon dioxide

glucose

heat

oxygen

The substances used in respiration are oxygen and **1**

The gas released during respiration is called **2**

When muscle cells respire, some of the energy released is lost as **3**

Extra muscle activity increases the amounts of glucose and **4** required by the muscle.

TURN OVER FOR THE NEXT QUESTION

Turn over ►

QUESTION THREE

The drawing shows the skull of a dog.

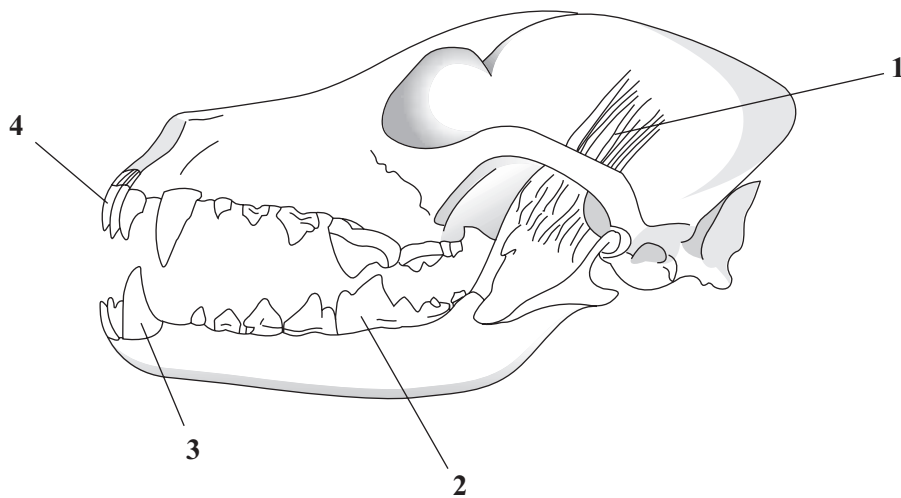
Match the functions in the list with the parts labelled 1–4 on the drawing.

crushes bones

grips prey and tears meat

makes the jaw move

pulls meat apart

**QUESTION FOUR**

Some mosquitoes feed on humans.

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

blood

muscles

proboscis

saliva

A mosquito feeds on **1**

A mosquito's throat has **2** to help it to suck up food.

Food is sucked up through a tube called a **3**

To keep its food in a liquid form the mosquito produces **4**

QUESTION FIVE

The drawing shows the muscles attached to the bones of the leg.

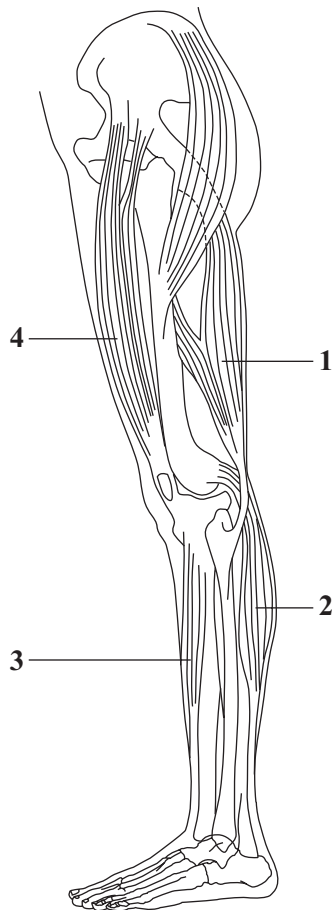
Match words from the list with the muscles labelled 1–4 on the drawing.

bends the leg at the ankle

pulls the leg backwards

straightens the leg at the ankle

straightens the leg at the knee



Turn over ►

NO QUESTIONS APPEAR ON THIS PAGE

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

Joints are formed where bones meet.

Which **two** features allow the joint to move smoothly?**cushion of air****layers of cartilage****oily synovial fluid****rigid bones****strong ligaments****QUESTION SEVEN**

Mussels feed by filtering plankton from the water.

Which **two** features are necessary to filter plankton from water?**ability to create a feeding current of water****ability to detect food in water****ability to move fast in water****ability to suck food****structures that act as a sieve for the plankton**

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 table shows the changes in the breathing pattern of a student before, during and shortly after exercise.

Activity	Breathing rate in breaths per minute	Volume of each breath in cm^3	Volume of air breathed in during one minute in cm^3
At rest	16	500	8000
During exercise	24	900	X
Shortly after exercise	20	650	13000

8.1 Volume **X** is

- A 37.5 cm^3
- B 2160 cm^3
- C 8900 cm^3
- D 21600 cm^3

8.2 From rest to exercise, the breathing rate increases by

- A a quarter.
- B a third.
- C a half.
- D two thirds.

8.3 When a muscle is exercised, it

- A** becomes weaker.
- B** contracts and relaxes.
- C** produces energy.
- D** sends more blood to the lungs.

8.4 Vigorous exercise may make the student's muscles stiff and sore.

This is often because

- A** the ligaments have been strained.
- B** the student had not exercised regularly.
- C** too much energy is released during exercise.
- D** too much glucose reaches the muscles.

TURN OVER FOR THE NEXT QUESTION

Turn over ►

QUESTION NINE

The table shows data about the length and swimming speed of a number of fish.

Type of fish	Herring	Dace	Pike	Goldfish	Cod	Mackerel	Carp
Length in metres (L)	0.40	0.16	0.60	0.10	0.90	0.50	1.00
Speed in metres per second (S)	1.68	1.20	1.67	1.10	2.40	2.00	1.85
Ratio of speed to length (S/L)	4.20	7.50	2.78	11.00	2.67	4.00	1.85

9.1 Which of the following is true of these data?

- A Herring are more than twice as long as Dace and swim faster
- B Herring swim twice as fast as Cod
- C Three of the fish are more than 0.80 metres long
- D Four of the fish have an S/L ratio less than 4.00

9.2 The values of S/L in the table

- A are less than double the speed.
- B are more than 5 times the length.
- C decrease as the length of the fish increases.
- D increase as the speed of the fish increases.

9.3 Fish are adapted to moving in water by having

- A a streamlined body which reduces resistance.
- B a tail fin with a small surface area.
- C a zig-zag arrangement of muscles.
- D honey-combed bones to reduce weight.

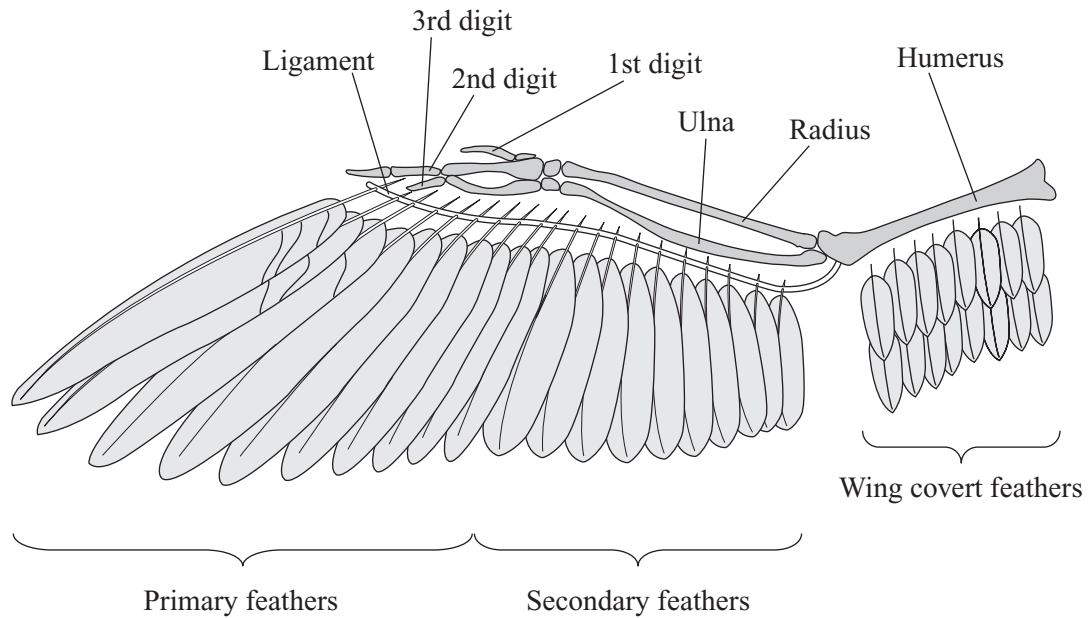
- 9.4** The muscles in the body of a fish
- A** are found only in the tail fin.
 - B** contract and relax to produce movement of the fish.
 - C** help to reduce drag.
 - D** keep the fish upright in the water.

TURN OVER FOR THE NEXT QUESTION

Turn over ►

QUESTION TEN

The drawing shows some of the structures in a bird's wing.



10.1 Which structure has a honey-combed interior?

- A Humerus
- B Ligament
- C Primary feather
- D Secondary feather

10.2 Which structure is strong, light and has a large surface area?

- A 3rd digit
- B Radius
- C Secondary feather
- D Ulna

10.3 The feathers are prevented from moving sideways by the

- A humerus.
- B ligament.
- C radius.
- D ulna.

10.4 When providing lift, the wings move

- A downwards.
- B upwards.
- C both upwards and downwards.
- D from side to side.

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.

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Mark your choices on the answer sheet.

QUESTION ONE

The drawing shows the muscles attached to the bones of the leg.

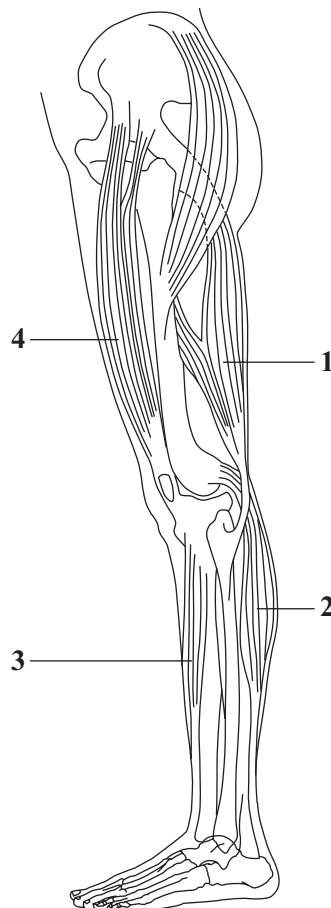
Match words from the list with the muscles labelled **1–4** on the drawing.

bends the leg at the ankle

pulls the leg backwards

straightens the leg at the ankle

straightens the leg at the knee



QUESTION TWO

Aphids feed on a sugar solution from cells inside plant stems.

Butterflies feed on a sugar solution produced by flowers at the base of their petals.

Houseflies obtain food from solid material such as bread.

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

aphid

butterfly

housefly

mosquito

Insect	Method of feeding
1	inserts a proboscis into food source, adds saliva and then sucks
2	inserts a short proboscis into food source and then sucks straight away
3	secretes enzymes onto the food through its proboscis and then sucks in digested material
4	uses a long proboscis to reach food and then sucks

TURN OVER FOR THE NEXT QUESTION

Turn over ►

NO QUESTIONS APPEAR ON THIS PAGE

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

Mussels feed by filtering plankton from the water.

Which **two** features are necessary to filter plankton from water?

- ability to create a feeding current of water**
- ability to detect food in water**
- ability to move fast in water**
- ability to suck food**
- structures that act as a sieve for the plankton**

QUESTION FOUR

Bone is a strong tissue.

Which **two** of the following prevent bone from being brittle?

- cartilage**
- deposits of calcium phosphate**
- living cells**
- protein**
- strong ligament fibres**

Turn over ►

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

Each of these questions has four parts.

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QUESTION FIVE

The table shows the changes in the breathing pattern of a student before, during and shortly after exercise.

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5.1 Volume **X** is

- A 37.5 cm³
- B 2 160 cm³
- C 8 900 cm³
- D 21 600 cm³

5.2 From rest to exercise, the breathing rate increases by

- A a quarter.
- B a third.
- C a half.
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5.3 When a muscle is exercised, it

- A** becomes weaker.
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5.4 Vigorous exercise may make the student's muscles stiff and sore.

This is often because

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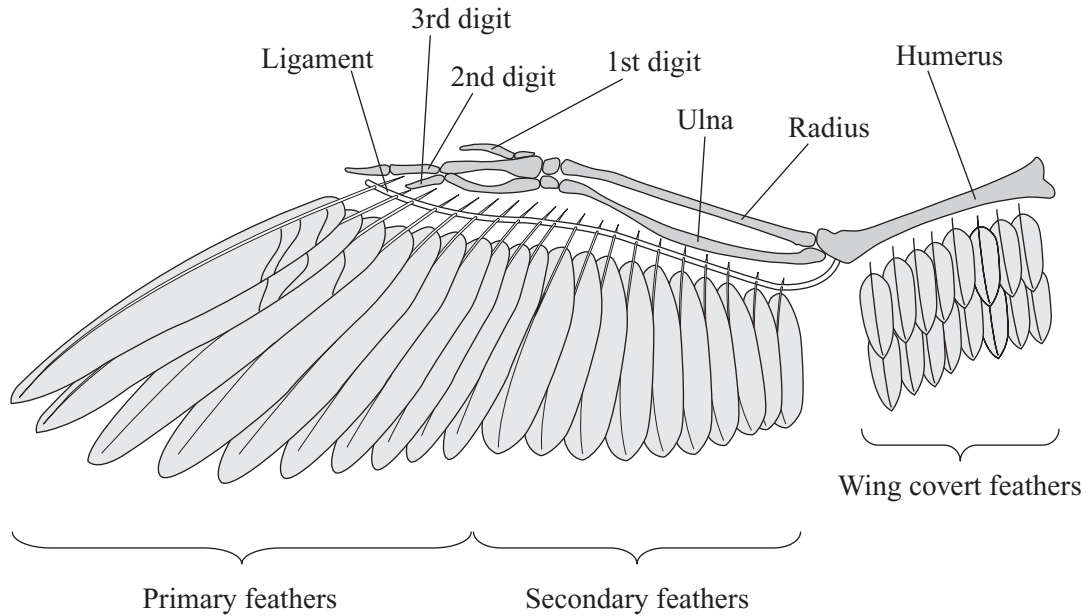
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TURN OVER FOR THE NEXT QUESTION

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QUESTION SEVEN

The drawing shows some of the structures in a bird's wing.



7.1 Which structure has a honey-combed interior?

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- D Secondary feather

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- C Secondary feather
- D Ulna

7.3 The feathers are prevented from moving sideways by the

- A** humerus.
- B** ligament.
- C** radius.
- D** ulna.

7.4 When providing lift, the wings move

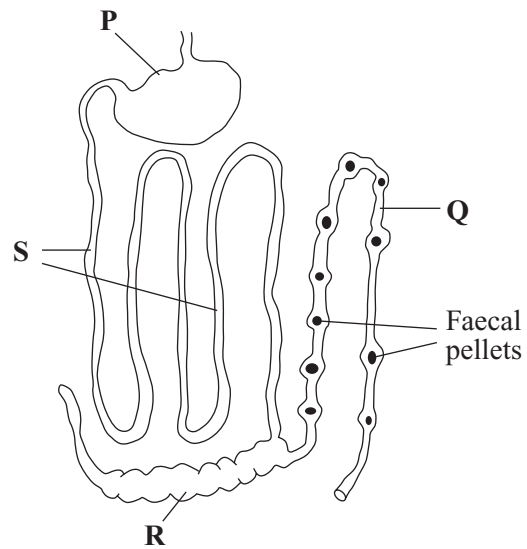
- A** downwards.
- B** upwards.
- C** both upwards and downwards.
- D** from side to side.

TURN OVER FOR THE NEXT QUESTION

Turn over ►

QUESTION EIGHT

The diagram shows the digestive system of a rabbit.



8.1 Where are the bacteria which digest cellulose mainly found?

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

8.2 Why do rabbits chew grass?

- A Chewed grass contains more cellulose
- B Chewed grass contains more glucose
- C Rabbits gain nutrients from the contents of broken cells
- D The digestive system does not have a caecum

8.3 Why do rabbits eat their faeces?

- A To digest the cellulose
- B To keep the bacteria alive
- C To obtain sugar produced by bacteria
- D To keep their burrows clean

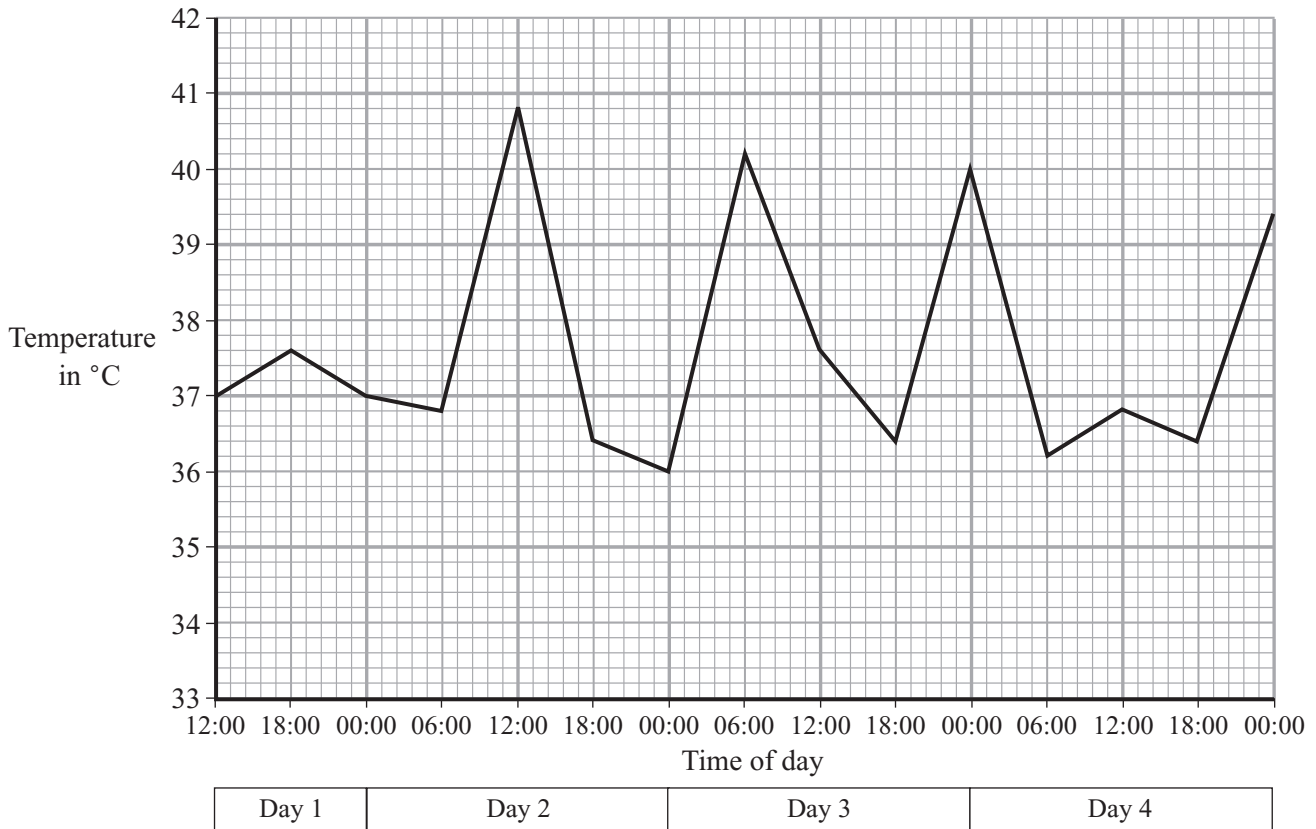
- 8.4** Why is the relationship between the rabbit and the bacteria described as *mutualism*?
- A** Rabbits are unable to digest the bacteria
 - B** Rabbits can live comfortably with the bacteria
 - C** Rabbits cannot digest cellulose
 - D** Rabbits provide food for the bacteria and the bacteria release sugars for the rabbits

TURN OVER FOR THE NEXT QUESTION

Turn over ►

QUESTION NINE

The chart shows the changes in the temperature of a person suffering from malaria.



9.1 The largest rise in temperature was from

- A 06:00 to 12:00 on day 2.
- B 12:00 to 18:00 on day 2.
- C 00:00 to 06:00 on day 3.
- D 18:00 to 00:00 on day 4.

9.2 The patient has a fever on

- A days 1 and 2.
- B days 1, 2 and 3.
- C days 2 and 3 only.
- D days 2, 3 and 4.

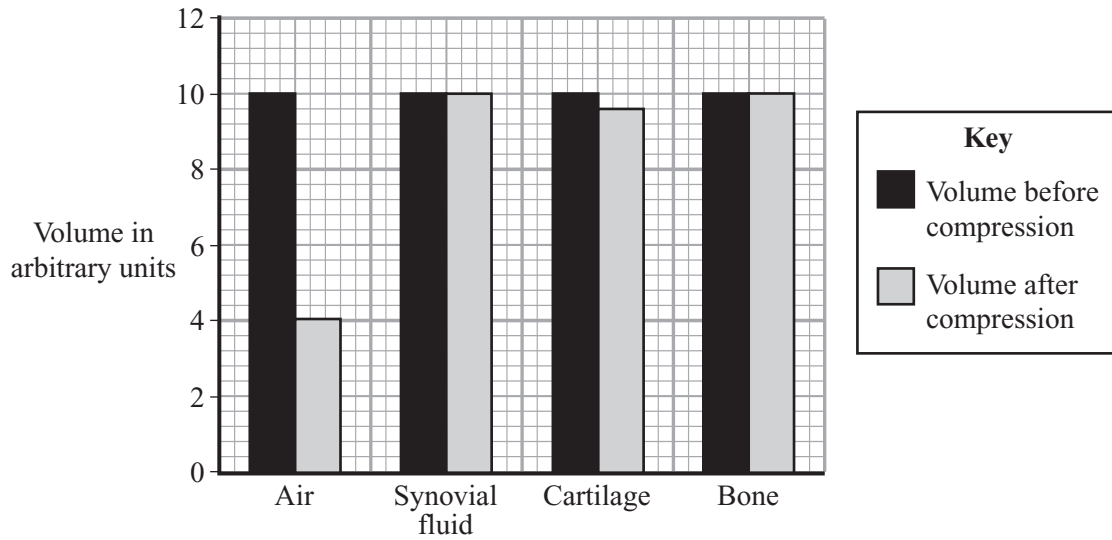
- 9.3** What causes the rapid rise in body temperature?
- A** Chemicals in the saliva of the mosquito
 - B** Loss of blood from the mosquito bite
 - C** Rupture of red blood cells and the release of parasites
 - D** The parasite feeding in the blood cells
- 9.4** An uninfected mosquito may become infected with the malarial parasite if
- A** it mates with a mosquito that is carrying the parasite.
 - B** it sucks the blood from an uninfected person.
 - C** it sucks the blood from a human who is infected.
 - D** the parasite is present in the mosquito's saliva.

TURN OVER FOR THE NEXT QUESTION

Turn over ►

QUESTION TEN

The chart shows the effect of the same size force on four different substances.



10.1 Compared with its original volume, the force reduces the volume of air by

- A 3%
- B 30%
- C 60%
- D 70%

10.2 The ability of cartilage to be slightly compressed means that it is useful at joints because

- A it absorbs shock.
- B it does not wear away.
- C it is easily bent.
- D it is smooth.

10.3 Tendons are useful for attaching muscles to bones because they

- A are able to contract and relax.
- B are liquid inside.
- C are strong and have very little elasticity.
- D cannot be compressed.

10.4 The aerofoil shape of a bird's wing creates lower air pressure above the wing.

This helps birds fly because

- A it increases the strength of wings.
- B it makes the wings streamlined.
- C it provides lift.
- D it reduces weight.

END OF TEST

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