

**GENERAL CERTIFICATE OF SECONDARY EDUCATION
GATEWAY SCIENCE
BIOLOGY B**

B631/01

Unit 1 Modules B1 B2 B3 (Foundation Tier)

Candidates answer on the Question Paper
A calculator may be used for this paper

OCR Supplied Materials:
None

Other Materials Required:

- Pencil
- Ruler (cm/mm)

**Friday 21 May 2010
Morning**

Duration: 1 hour



Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your Candidate Number, Centre Number and questions number(s).

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **60**.
- This document consists of **20** pages. Any blank pages are indicated.

Answer **all** the questions.

Section A – Module B1

1 Look at Matthew.

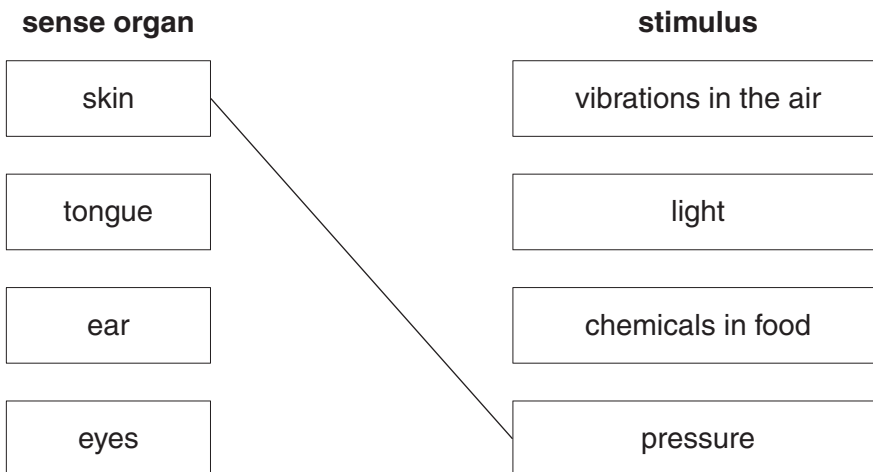


(a) His body gathers information from the sense organs.

Receptors in the sense organs detect a certain type of stimulus.

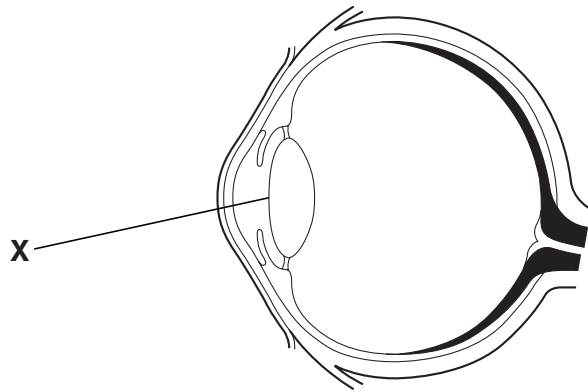
Draw straight lines to connect each **sense organ** to its correct **stimulus**.

One line has been drawn for you.



[2]

(b) Look at the diagram of the eye.



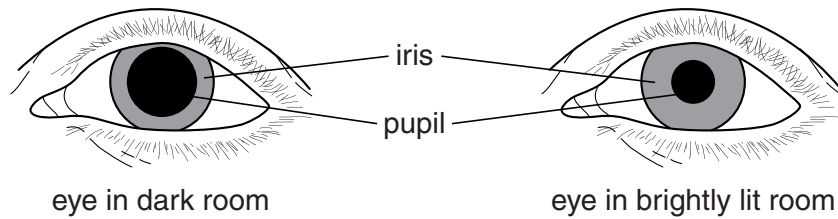
Write down the name of the part labelled X.

Part X [1]

(c) Matthew moves from a dark room into a brightly lit room.

His pupils automatically change in size as shown in the diagram.

This happens quickly.



Write down the name of this type of response.

..... [1]

(d) The iris is the coloured part of the eye.

What controls the colour of the iris?

..... [1]

(e) Matthew cannot tell the difference in colour between red and green objects.

This is a condition called red-green colour blindness.

How has he got the condition of red-green colour blindness?

..... [1]

[Total: 6]

2 Look at the picture of a new born baby.



(a) The midwife checks the health of the baby.

As part of these checks the midwife uses a thermometer to measure the temperature of the baby's body.

Where would the midwife put the thermometer to get the baby's body temperature?

..... [1]

(b) The baby is wrapped in a blanket to prevent loss of heat from the body.

Write down **one** way the body loses heat.

..... [1]

(c) The midwife will also make sure that the baby is immunised.

(i) How does immunisation help the child?

..... [1]

(ii) The baby's white blood cells are important in immunisation against certain pathogens.

Write down **two** ways the baby's white blood cells can help to destroy pathogens.

.....
.....
..... [2]

[Total: 5]

3 Look at the three diets below.

Diet A	
Food group	%
carbohydrate	55
protein	20
fat	15
vitamins	trace
minerals	trace
fibre	10

Diet B	
Food group	%
carbohydrate	55
protein	15
fat	20
vitamins	trace
minerals	trace
fibre	10

Diet C	
Food group	%
carbohydrate	70
protein	5
fat	10
vitamins	trace
minerals	trace
fibre	15

Health professionals recommend that 10 to 15 per cent of a healthy **adult** diet is made up of protein.

Some developing countries have diets which are low in protein.

(a) Which diet is most likely to be from a developing country?

Choose from **A, B** or **C**.

Diet [1]

(b) Which **one** of these diets would be suitable for a **growing** teenager?

Choose from **A, B** or **C**.

Diet

Write down one reason for your answer.

.....
 [2]

[Total: 3]

4 Neil is starting a new job.

His new company asks him to get a medical check up.

The doctor measures Neil's blood pressure and tells him it is too high.

(a) Different lifestyle factors can affect a person's blood pressure.

Look at the statements below.

Which **two** lifestyle factors could cause Neil to have **high** blood pressure?

Put ticks (✓) in the **two** correct boxes.

- | | |
|-------------------------------|--------------------------|
| eating a low fat diet | <input type="checkbox"/> |
| exercising regularly | <input type="checkbox"/> |
| high amount of salt in diet | <input type="checkbox"/> |
| relaxation classes | <input type="checkbox"/> |
| excessive alcohol consumption | <input type="checkbox"/> |

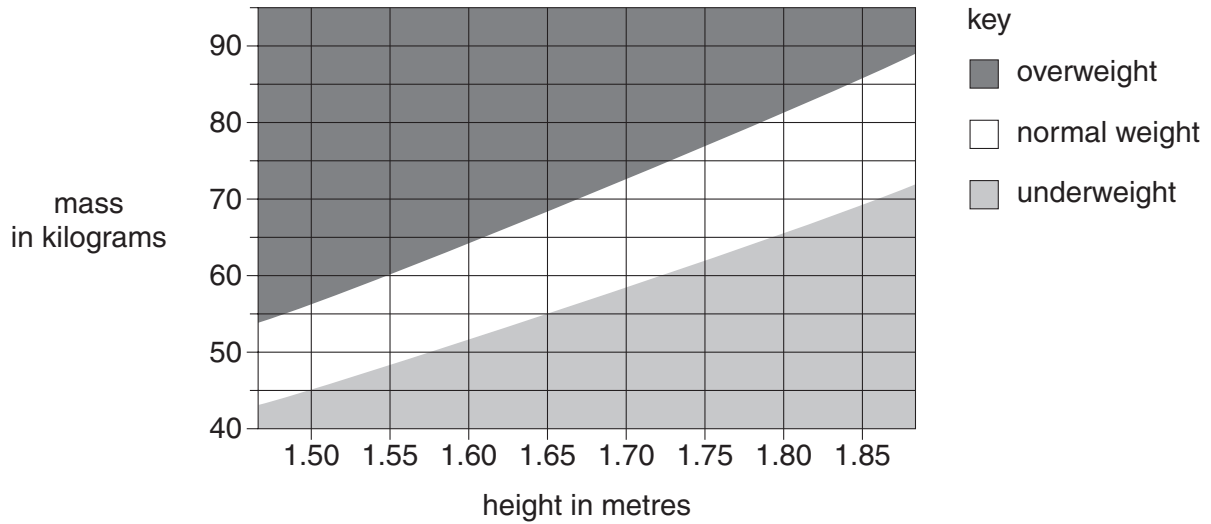
[1]

(b) The doctor measures Neil’s height and weighs him.

Neil is **1.80 m** tall and has a mass of **91.0 kg**.

(i) The doctor uses a chart to decide how to describe Neil’s weight.

Look at the chart below.



Use the chart to describe Neil’s weight.

..... [1]

(ii) The doctor can also use Neil’s height and mass to calculate his body mass index (BMI).

Calculate Neil’s body mass index (BMI) using the formula

$$BMI = \frac{\text{mass in kg}}{(\text{height in m})^2}$$

Show your working.

Neil’s BMI = [2]

(c) The doctor has to record if Neil is fit and healthy.

Explain the difference between fitness and health.

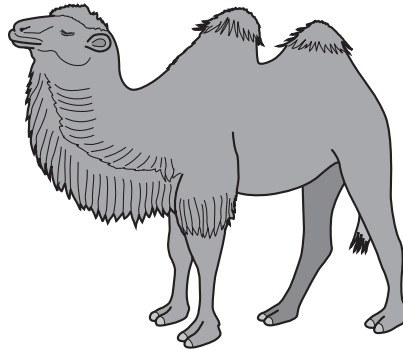
.....

 [2]

[Total: 6]

Section B – Module B2

5 Camels live in deserts which are hot and dry.



(a) What type of animal is the camel?

Put a tick (✓) in the box next to the correct answer.

- an invertebrate and a mammal
- a vertebrate and a reptile
- a vertebrate and a mammal
- an invertebrate and an amphibian

[1]

(b) Camels can survive body temperatures of up to 41 °C without sweating.

Not sweating is an advantage to the camel in the desert.

Write down why.

..... [1]

(c) Camels eat mainly grass.

Grass is difficult to digest.

Camels have microorganisms in their gut that help them digest the grass.

The microorganisms have somewhere warm to live with plenty of food.

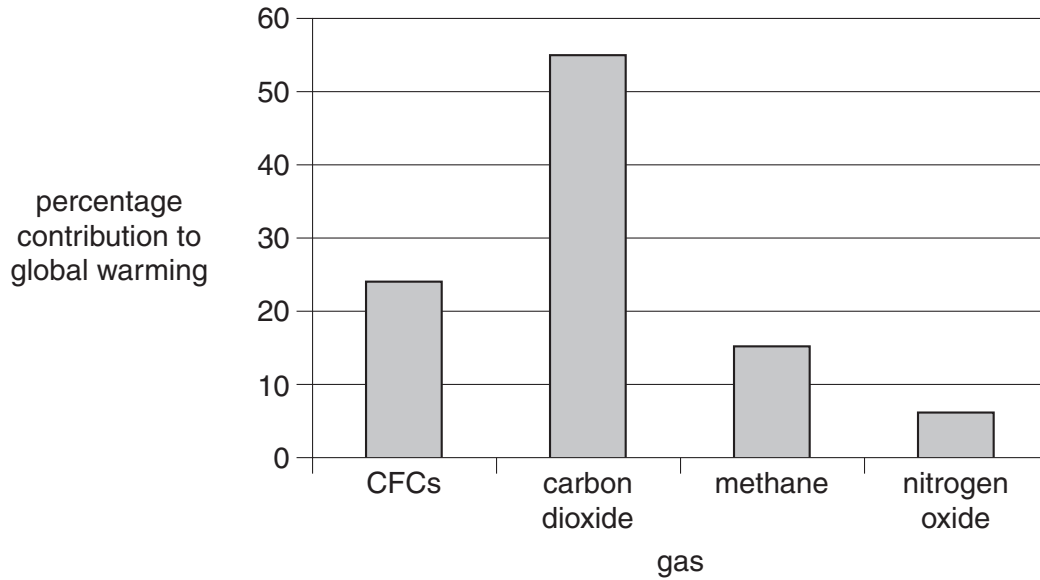
What name is given to this type of relationship where both species benefit?

..... [1]

(d) The microorganisms give off a lot of methane gas which is released from the camel.

Methane is one of the gases that cause global warming.

The bar chart shows how much each gas contributes to global warming.



(i) Write down the gases in order of how much they contribute to global warming.

Start with the largest contributor first.

One has been done for you.

..... methane

(largest) (smallest)

[1]

(ii) Carbon dioxide levels in the air are increasing.

Why is this?


..... [1]

[Total: 5]

6 Read the article.

Operation Bumblebee

Bumblebees are large insects that live on plants like clover.



Scientists are worried because the number of bumblebees has dropped by 70% in the last 30 years.

This is because the areas where they live are being destroyed.

The scientists are now asking farmers to grow clover by the side of their fields to try to save bumblebees.

(a) Why do the scientists think that bumblebee numbers are dropping?

Put a tick (✓) in the box next to the correct answer.

- There is too much competition from larger insects.
- Their habitat is disappearing.
- They are being poisoned by clover.
- They are being killed by farmers.

[1]

(b) Scientists are worried that bumblebees might become **extinct**.

Write down what is meant by the term extinct.

.....

..... [1]

- (c) The scientists are trying to save bumblebees by protecting where they live.

Write down **one other** way that endangered species can be helped.

.....
..... [1]

- (d) Some animals are endangered and some are extinct.

Put **one** tick (✓) next to each animal to show if it is endangered or extinct.

animal	endangered	extinct
gorilla		
mammoth		
panda		

[2]

[Total: 5]

7 The photograph shows a type of wolf that lives on an island in Canada.



(a) The wolf is a predator.

Describe **one** feature shown in the photograph that helps it to be a predator.

..... [1]

(b) The wolves on the island compete with each other.

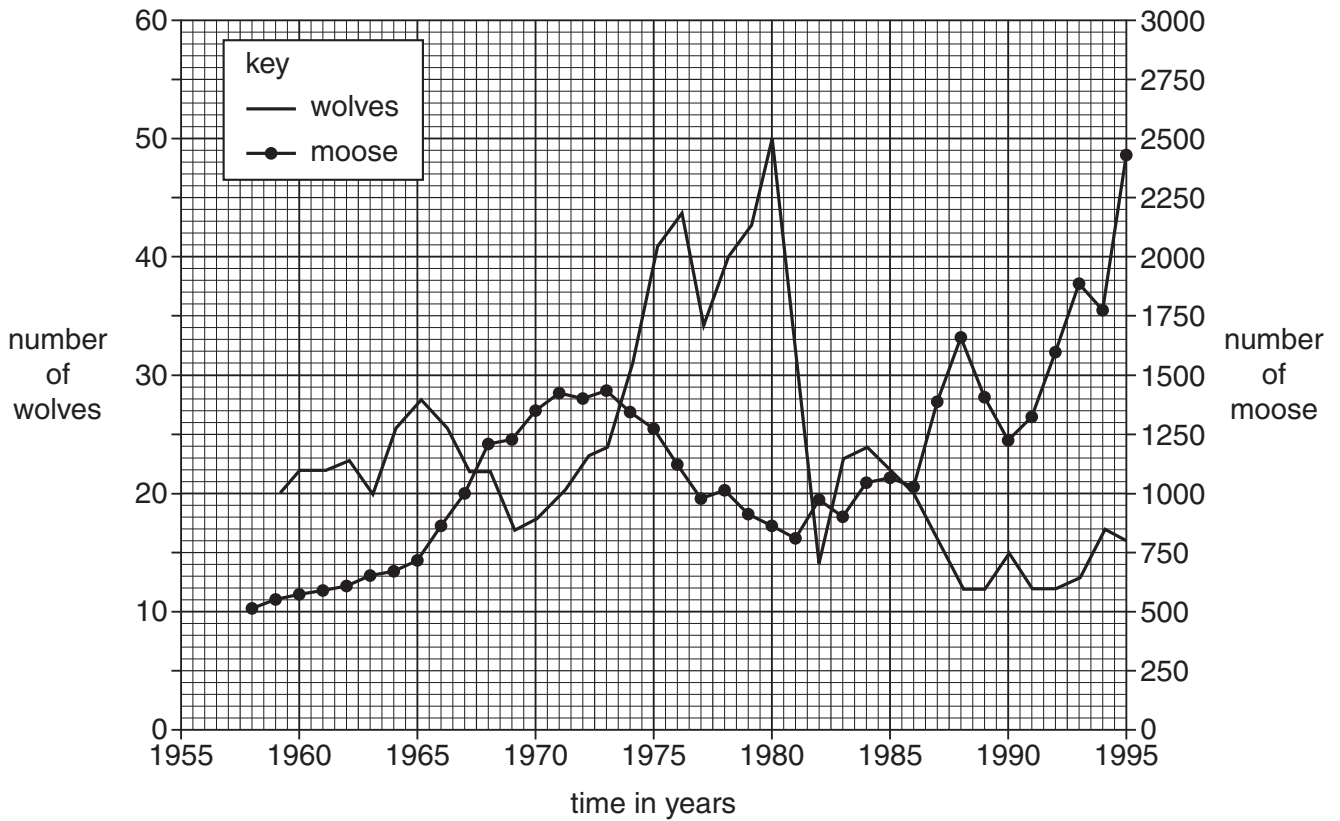
Write down **one** resource that they might compete for.

..... [1]

(c) There are also animals called moose living on the island.

The wolves prey on the moose.

The graph shows the numbers of wolves and moose on the island between 1958 and 1995.



(i) What is the **highest** number of wolves that have lived on the island between 1958 and 1995?

..... [1]

(ii) Visitors to the island are thought to have brought a disease onto the island.

Over the next two years this disease killed most of the wolves.

In which year did this disease reach the island?

..... [1]

(iii) What effect did this disease have on the number of moose?

Explain why it had this effect.

effect

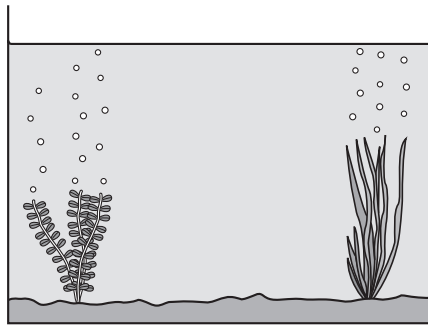
explanation

..... [2]

[Total: 6]
Turn over

8 Gary is looking at some pondweed in a tank of water.

The pondweed is photosynthesising.



(a) The pondweed is making bubbles of a gas.

What gas is made by photosynthesis?

..... [1]

(b) What else is the pondweed making during photosynthesis?

..... [1]

(c) Plants like pondweed grow faster in the summer than in the winter.

Explain why.

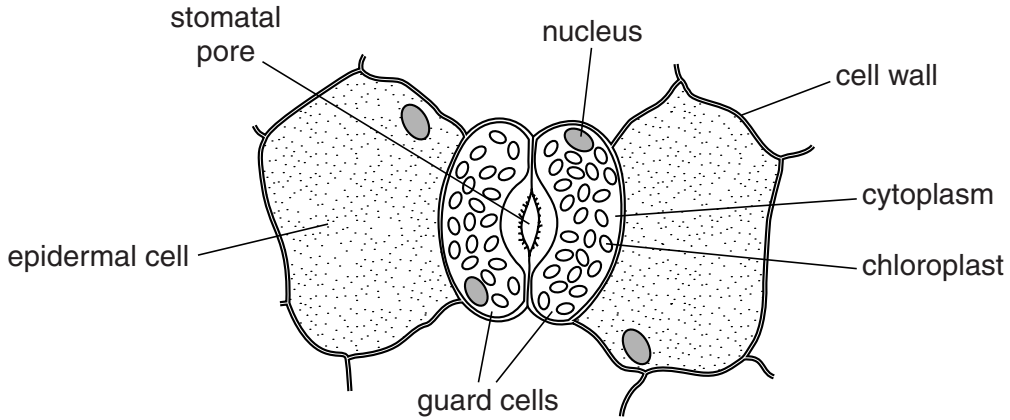
.....
.....
..... [2]

[Total: 4]

Section C – Module B3

9 Look at the diagram.

It shows some leaf cells.



(a) Write down the name of the part of a cell that contains genetic information.

..... [1]

(b) Describe **two** ways that plant cells are different from animal cells.

1

.....

2

..... [2]

(c) Water molecules leave through the stomata.

Write down the name of this process.

..... [1]

(d) As a leaf grows it makes new cells.

How are new cells made by the leaf?

..... [1]

[Total: 5]

10 Look at the picture.

It shows an elephant foetus in its mother's uterus.



umbilical cord

(a) The umbilical cord of the foetus is attached to the placenta.

In the placenta, which substances pass **from** the mother's blood **to** the blood of the foetus?

Put a tick (✓) in the box next to the correct answer.

- carbon dioxide and oxygen
- food and waste
- food and oxygen
- waste and oxygen

[1]

(b) Blood is pumped through blood vessels in the umbilical cord.

(i) Write down the name of **one** type of blood vessel.

..... [1]

(ii) Write down the name of the organ that pumps the blood.

..... [1]

(c) Blood contains red blood cells.

Red blood cells transport oxygen.

Describe **two** features of a red blood cell that help it to do its job.

1

2 [2]

[Total: 5]

11 Paula and James are investigating how light affects the growth of shoots.

(a) **A, B, C** and **D** are four sentences about the method they use.

They are in the wrong order. Fill in the boxes to show the correct order.

The first one has been done for you.

- A** Place one dish inside the box and the other dish on top of the box.
- B** Cut a hole in the side of a box so light only enters from one direction.
- C** Put damp cotton wool into two dishes.
- D** Sprinkle cress seeds onto the cotton wool.

B			
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[2]

(b) Paula and James leave the dishes for one week.

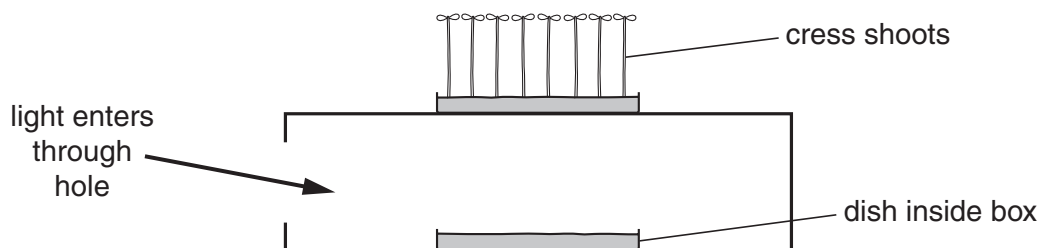
The dish on top of the box gets light from **all** directions.

The dish in the box gets light from only **one** direction.

The cress seeds grow shoots.

Paula draws a diagram to show the cress shoots in the dish on top of the box.

Finish the diagram to show the cress shoots in the dish **inside** the box.



[1]

(c) James tells Paula that the results provide evidence that cress shoots are positively geotropic.

Is James correct?

Explain your answer.

.....

.....

[1]

[Total: 4]

12 Look at the table about different varieties of strawberries.

It shows the mass of strawberries each variety produces in one year.

The data was collected for three years.

variety	mass of strawberries in g			average mass in g
	year 1	year 2	year 3	
Fresno	833	863	1172	956
Lassen	971	1109	1355	1145
Tioga	1085	1263	1357	1235
Torrey	890	963	820	

(a) (i) Which variety produced the lowest mass of strawberries in **year 1**?

..... [1]

(ii) Calculate the **average mass** of strawberries for the Torrey variety.

Show your working.

answer g [2]

(b) Look at the diagram.

It shows a strawberry plant reproducing asexually.



(i) Describe how the plant reproduces asexually.

.....
.....
..... [2]

(ii) Asexual reproduction produces genetically identical copies.

Write down the name given to genetically identical copies.

..... [1]

[Total: 6]

END OF QUESTION PAPER

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