

Candidate Name	Centre Number	Candidate Number
		0



**GCSE**

235/01

**SCIENCE  
FOUNDATION TIER  
BIOLOGY 1**

A.M. THURSDAY, 13 January 2011

45 minutes

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1	7	
2	4	
3	7	
4	6	
5	11	
6	6	
7	6	
8	3	
<b>Total</b>	<b>50</b>	

**ADDITIONAL MATERIALS**

In addition to this paper you may require a calculator and a ruler.

**INSTRUCTIONS TO CANDIDATES**

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet.

**INFORMATION FOR CANDIDATES**

The number of marks is given in brackets at the end of each question or part-question.

You are reminded of the necessity for good English and orderly presentation in your answers.

*Answer all questions.*

1. Using only the information given, answer the questions that follow.

- Some penguins live in the Antarctic, where it is very cold.
- Their bodies are streamlined.
- They have webbed feet and wings that act as flippers.
- They have lots of fat under their skin.
- On land they huddle together in large groups.
- The feathers have a layer of oil to waterproof them.
- The black feathers absorb heat from the sun.



Source: wildwildweather.com

(a) State **two** ways in which penguins keep warm. [2]

(i) .....

(ii) .....

(b) State **three** ways in which penguins are adapted for swimming. [3]

(i) .....

(ii) .....

(iii) .....

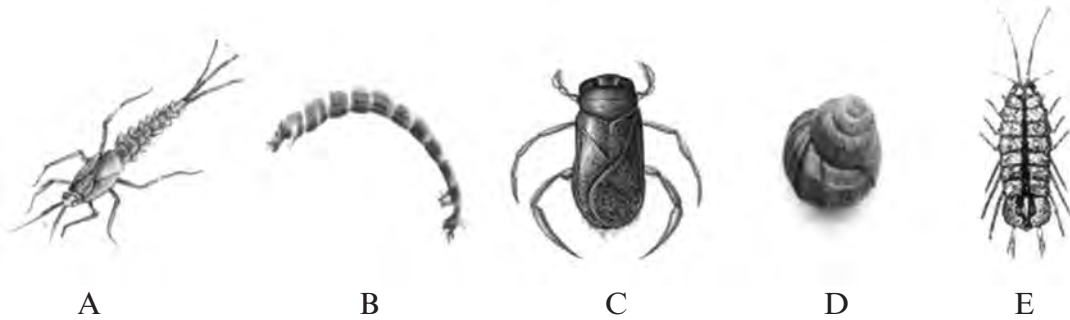
(c) (i) Underline **one** of the following statements to suggest why it is an advantage for penguins to have heavy, solid bones. [1]

- I. to help them fly
- II. so they can stay under water
- III. to keep them warm

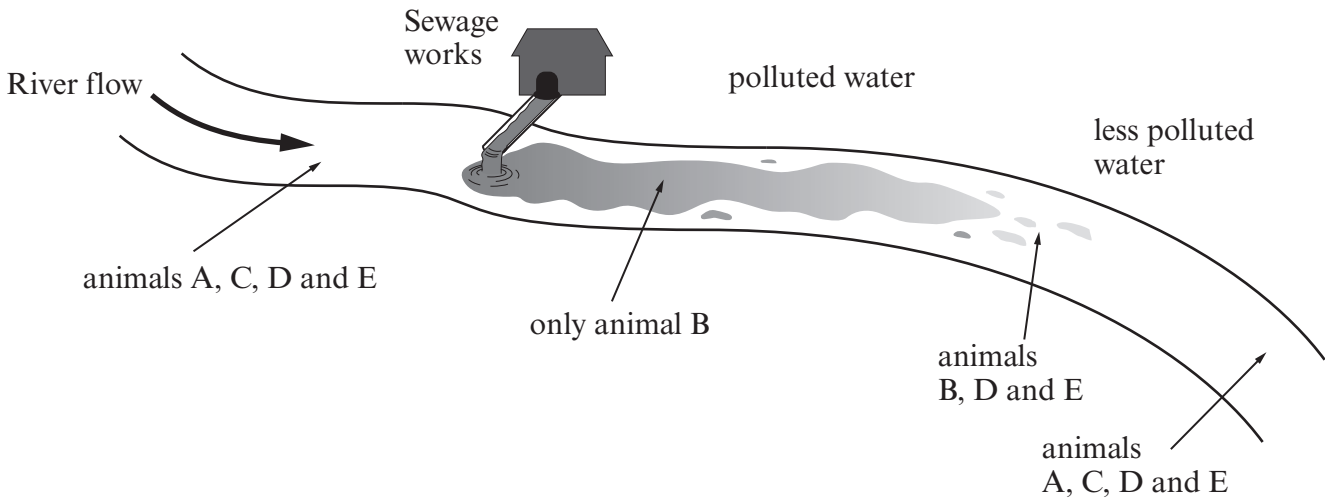
(ii) Suggest **one** reason why most other birds have light, hollow bones. [1]

.....

2. The animals below live in different parts of a river.



The diagram shows where each animal is found.



(a) Which of the animals A-E, is best able to survive in polluted water? [1]

.....

(b) (i) Using the letters A-E, which **two** of these animals cannot live in polluted water? [2]

..... and .....

(ii) These two animals tell us whether the water is polluted or not. Underline the correct answer below. [1]

They are known as:

Endangered species

Indicator species

Sample species

Rare species

3. Ladybirds feed on greenfly.  
Some ladybirds have 7 spots and are larger than the ones with 6 spots.

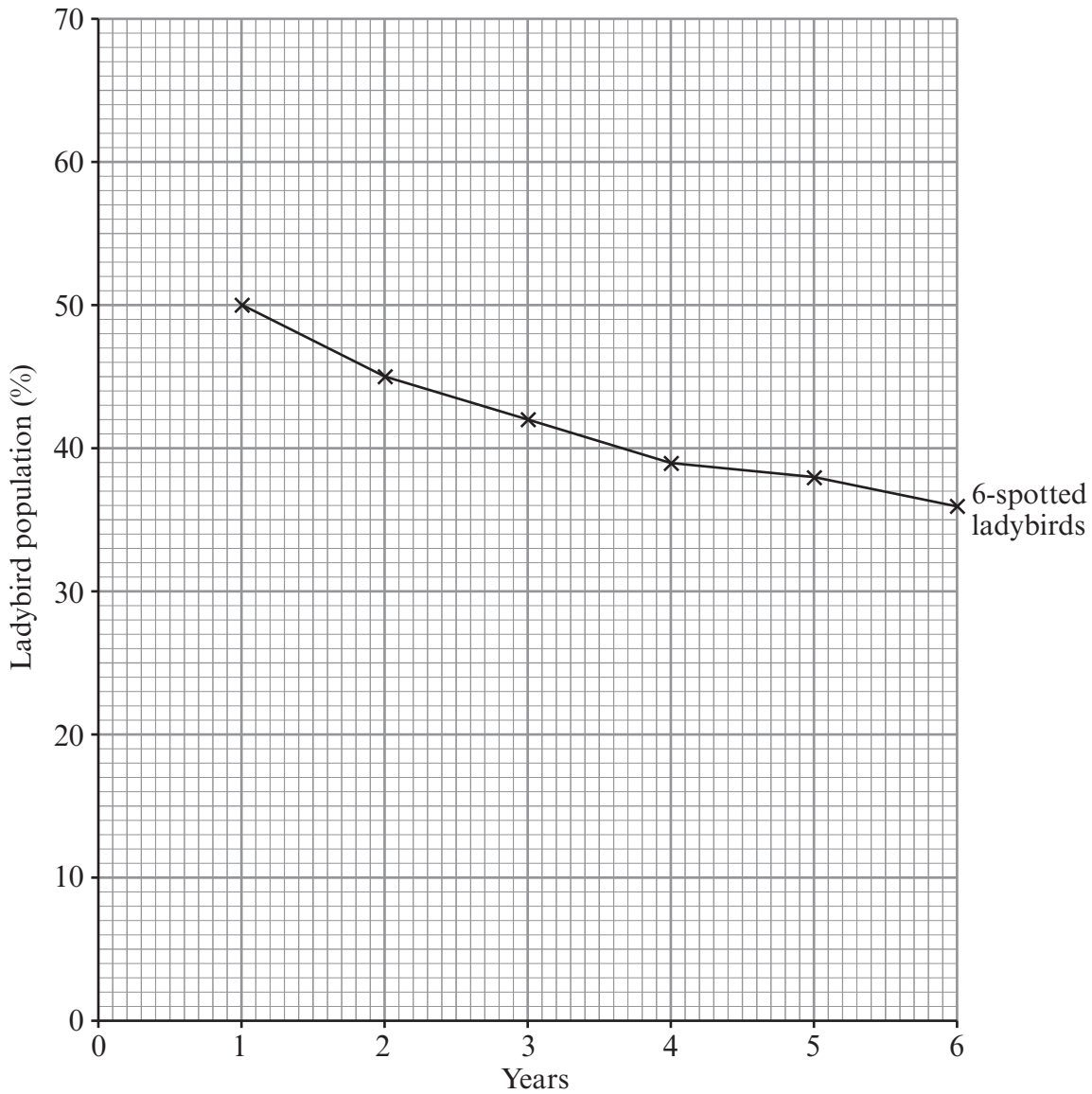


A number of 6-spotted ladybirds were introduced into a field where a population of 7-spotted ladybirds already lived.  
The table shows the results in the changes in the populations over 6 years.

Year	Ladybird population (%)	
	6-spotted	7-spotted
1	50	50
2	45	55
3	42	58
4	39	61
5	38	62
6	36	64

- (a) Plot the results for the 7-spotted ladybirds.  
The graph for the 6-spotted ladybirds has been done for you.  
Join the plots with a ruler.

[3]



- (b) What has happened to the populations of

(i) 6-spotted ladybirds,

[1]

.....

(ii) 7-spotted ladybirds?

[1]

.....

- (c) Suggest why the numbers of the two types of ladybirds are changing.

[2]

.....

.....

4. When Gareth heard a sudden loud noise, he jumped up out of his seat.

His response was a reflex action.

(a) State **two** features that show it was a reflex action. [2]

(i) .....

(ii) .....

(b) (i) Fill in the blanks by using some of the words below. [3]

eyes                  sound                  ears                  light                  receptors

The stimulus in Gareth's reflex was .....

The stimulus was detected by ..... in Gareth's

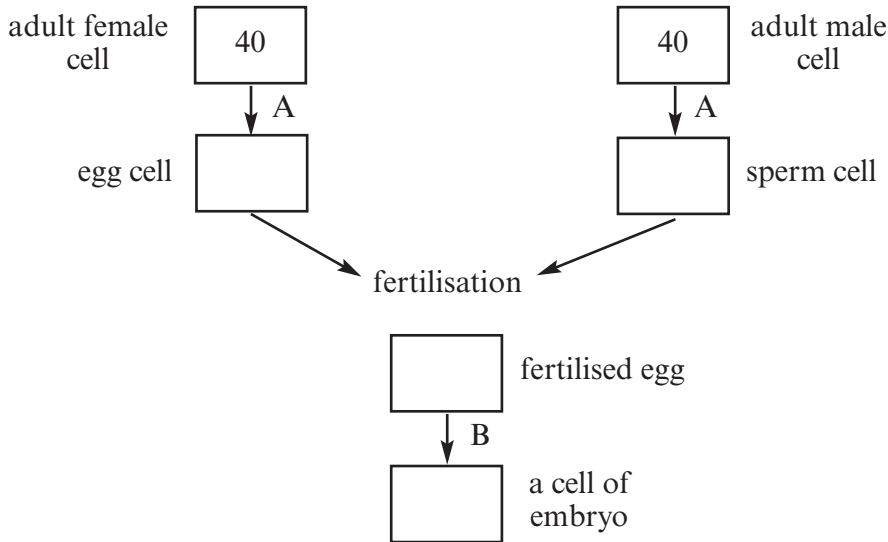
.....

(ii) In what form is the information transferred to the brain? [1]

.....

6

5. (a) Ferret body cells contain 40 chromosomes.  
Put the correct number of chromosomes in each box below. [2]



Ferret

- (b) Name the type of cell division that is taking place at: [2]

(i) A .....

(ii) B .....

- (c) Chromosomes control inherited characteristics.  
Fill in the blanks using some of the words below. [3]

DNA

genes

cytoplasm

nucleus

Chromosomes are long strands of a chemical called .....

They are found in the ..... of a cell.

Chromosomes carry inherited information in sections called .....

- (d) The table shows some of the features of a ferret.

Place ticks (✓) in the table to show whether the features are due to inheritance, environment or **both**. [4]

Feature	Inherited	Environmental
female		
white fur on ears		
broken leg		
mass 350 g		

6. In tigers the normal fur colour is mainly orange with black stripes. This orange colour is caused by a dominant allele **R**.

Tiger



Source: *Google Images*

Over a number of years, a pair of heterozygous orange tigers named Sashi and Ravi produced 13 cubs in a Zoo in India. Three of these cubs were white. (White with black stripes).

- (a) (i) State the genotypes of Sashi and Ravi. [1]

Sashi ..... Ravi .....

- (ii) Complete the Punnett square below to show how the white cubs were produced. [2]

Gametes		



- (b) Complete the Punnett square below to show how an orange tiger mated with a white tiger could produce offspring **all** of which were orange. [2]

Gametes		

- (c) The orange tigers and the white tigers are the same species (*Panthera tigris*). What name is given to the differences that are found between organisms of the same species? [1]

.....

6

7. (a) (i) Name the organ in the body which produces insulin. [1]

.....

(ii) I. How does insulin reduce the concentration of glucose in the blood? [1]

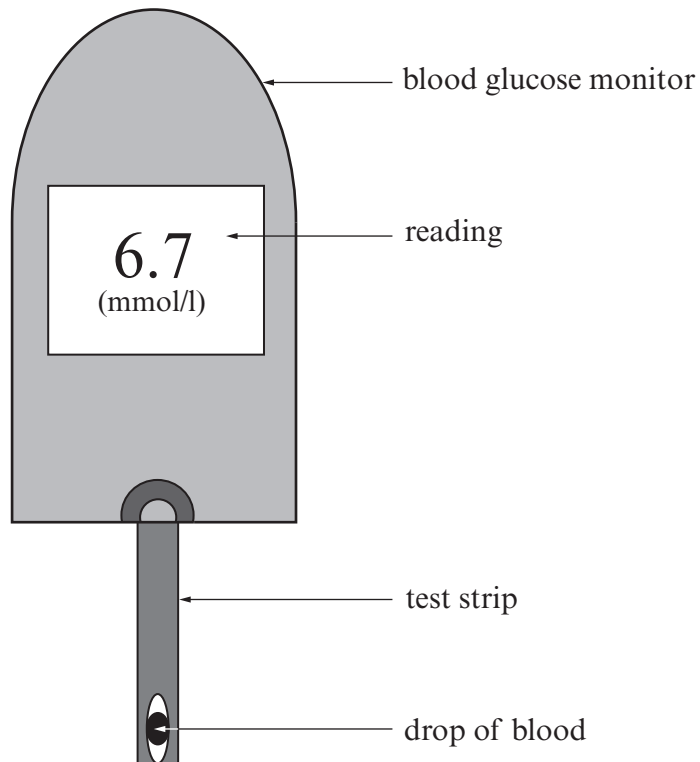
.....

.....

II. In which organ in the body does this take place? [1]

.....

(b) Owen has diabetes. He measures his blood glucose level using a monitor.



Owen injects himself with a measured dose of insulin before each meal. The dose depends on his blood glucose reading. If the glucose reading is high, Owen injects a higher dose of insulin.

Owen monitors his blood glucose regularly throughout each day. He records his readings in a diary. He tries to keep his blood glucose reading within the normal range of 4.0 - 7.0 (mmol/l).

The table below shows a section from Owen's diary over a 3 day period.

Owen's blood glucose level (mmol/l)							
<i>Date</i>	<i>Before breakfast</i>	<i>2 hours after breakfast</i>	<i>Before midday meal</i>	<i>2 hours after midday meal</i>	<i>Before evening meal</i>	<i>2 hours after evening meal</i>	<i>Before bed</i>
29 Jan 09	7.0		9.1	6.8	4.3	14.2	12.9
30 Jan 09	9.0	7.5	7.1		6.2		7.9
31 Jan 09	5.3		7.4		2.9		8.2

(i) Suggest a reason for:

I. the high reading 2 hours after the evening meal on 29 Jan (circled); [1]

.....  
 .....

II. the low reading before the evening meal on 31 Jan (circled). [1]

.....  
 .....

(ii) Suggest why Owen always measures his blood glucose before bedtime. [1]

.....  
 .....

(Questions continue over page.)

8. Some people are at higher risk of heart attack because their blood contains a high level of cholesterol.

Simvastatin and Pravastatin are drugs which lower the cholesterol in the blood.

A trial was carried out to find out which of the 2 drugs was more effective in reducing heart attacks.

- The same number of patients were given either Simvastatin, Pravastatin or a placebo (a pill containing neither drug).
- The patients did not know which pill they were taking.
- The level of cholesterol in the blood of the patients at the start of the trial was the same.

The results are shown in the table below.

Treatment	People who had heart attacks (%)
Simvastatin	26
Pravastatin	11
Placebo	33

(a) Suggest what conclusion the researchers came to at the end of the trial. [1]

.....

.....

(b) Suggest **one** reason why a placebo was used in this trial. [1]

.....

.....

.....

(c) Give **one** way in which the trial was kept fair. [1]

.....

.....

3