

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
TOTAL	



General Certificate of Secondary Education
Higher Tier
June 2010

Science B
Unit Biology B1

BLY1H

H

Biology
Unit Biology B1

Written Paper

Wednesday 9 June 2010 1.30 pm to 2.15 pm

You will need no other materials.
You may use a calculator.

Time allowed

- 45 minutes

Instructions

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 45.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.

Advice

- In all calculations, show clearly how you work out your answer.



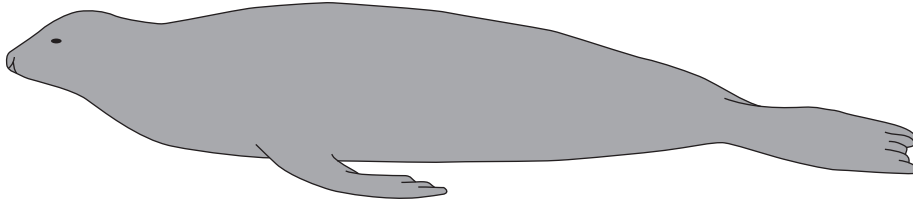
J U N 1 0 B L Y 1 H 0 1

Answer **all** questions in the spaces provided.

- 1** Seals are adapted for life in the sea.
Use information from the drawings to answer the questions.

This drawing shows seal **X**.

Seal X



- 1 (a)** Give **two** ways in which seal **X** is adapted for swimming.

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2

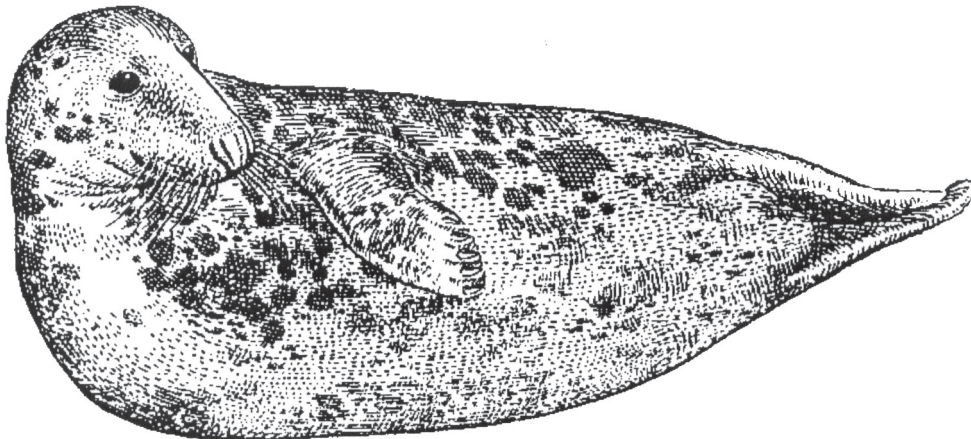
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(2 marks)



1 (b) This drawing shows seal Y, drawn to the same scale as seal X.

Seal Y



Seal Y lives in much colder seas than seal X.

Explain **one** way in which seal Y is adapted for surviving in cold seas.

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(2 marks)

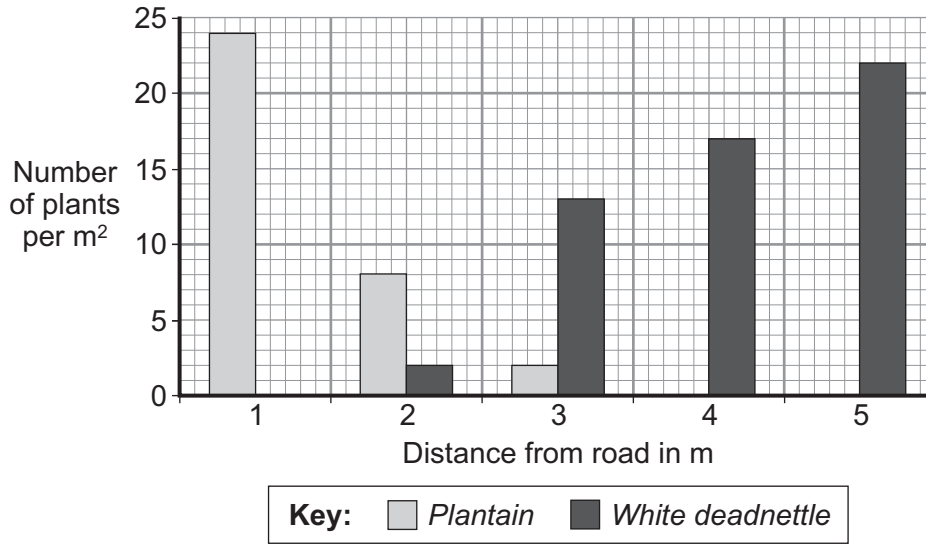
4

Turn over for the next question

Turn over ►



2 Students investigated the distribution of two plant species near a busy road. The bar chart shows their results.



2 (a) (i) Name the piece of apparatus used in sampling a 1 m² piece of land.

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(1 mark)

2 (a) (ii) Describe how this piece of apparatus could be used to obtain the data shown in the bar chart.

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(2 marks)

2 (a) (iii) Describe the pattern shown in the data for the *Plantain* plants.

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(1 mark)



2 (b) Suggest explanations for:

2 (b) (i) the distribution of the *White deadnettle* plants

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(2 marks)

2 (b) (ii) the distribution of the *Plantain* plants.

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(2 marks)

8

Turn over for the next question

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ANSWER IN THE SPACES PROVIDED**



3 Influenza is an infectious disease. The influenza virus often mutates. This has made the World Health Organisation worried about another influenza *pandemic*.

3 (a) What is meant by a *pandemic*?

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(1 mark)

3 (b) Explain why a mutation of the influenza virus might cause another influenza pandemic.

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(3 marks)

4

Turn over for the next question

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4 Diet and exercise affect health.

4 (a) Many people are obese (very overweight).

Obesity can lead to heart disease.

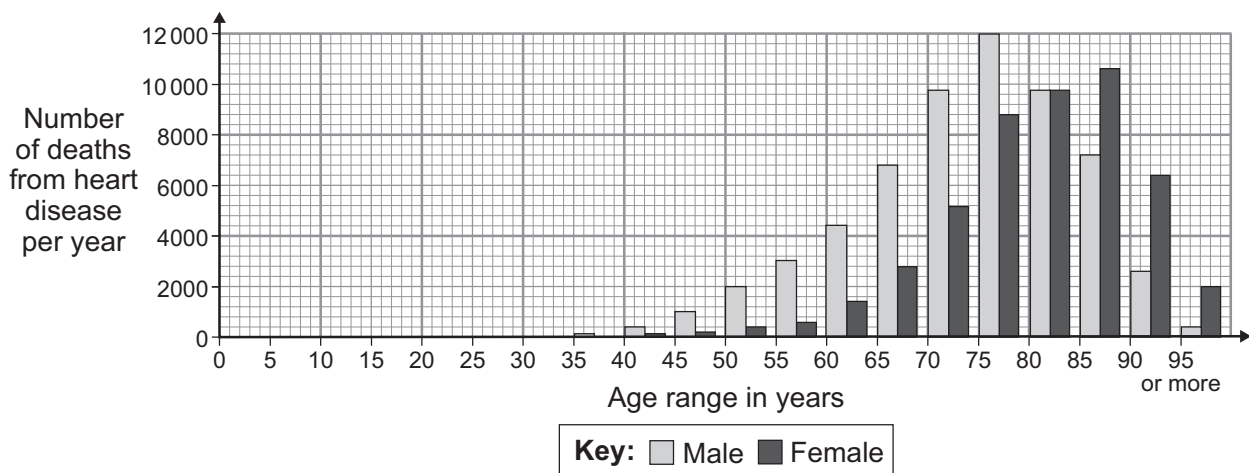
Other than heart disease, name **two** conditions which are linked to obesity.

1

2

(2 marks)

4 (b) The graph shows the number of deaths from heart disease each year in the UK.



The pattern for deaths from heart disease in men is different from the pattern in women.

4 (b) (i) Give **two** differences between the patterns for men and women.

1

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(2 marks)



4 (b) (ii) Suggest **two** reasons for the difference in the number of deaths from heart disease in men and women between the ages of 40 and 60.

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(2 marks)

4 (c) Scientists have developed drugs to reduce the concentration of cholesterol in the blood. Give the **three** main stages in testing a new drug before it is sold to the public.

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(3 marks)

9

Turn over for the next question

Turn over ►



- 5 Drinking after exercise to replace the water lost in sweat is called rehydration. Scientists at a Spanish university investigated rehydration after exercise.
- 24 students took part in the investigation.
 - All the students ran on a treadmill in a temperature of 40°C until they were exhausted.
 - 12 of the students were each given half a litre of beer to drink.
 - The other 12 students were each given half a litre of tap water to drink.
 - Both groups of students were then allowed to drink as much tap water as they wanted.
 - The scientists measured how quickly each student rehydrated.
 - The students who had been given beer rehydrated 'slightly better' than the ones given only water.

A newspaper reported the investigation.

The headline was

'Forget water after a workout ... drink some beer instead.'

The newspaper headline was **not** justified.

Explain why.

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(3 marks)

3



6 Scientists have recently cloned a mouse that had died and been frozen for 16 years.

6 (a) Explain what is meant by a clone.

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(2 marks)

6 (b) The scientists used an egg cell from a living mouse and the genetic material from a brain cell of the frozen mouse.

Describe how the process of adult cell cloning could be used to clone the frozen mouse.

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(3 marks)

6 (c) People could ask scientists to use this technique to clone long-dead relatives, whose bodies have been deep-frozen.

Most people would be opposed to cloning a human from a deep-frozen, long-dead relative.

Give **one** reason why.

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(1 mark)

6

Turn over ►



7 The photograph shows a flamingo.



- Flamingos feed on organisms that live in mud at the bottom of lakes.
- Leopards prey on flamingos.
- Flamingos find it difficult to fly if their feathers get wet.

Flamingos have evolved very long legs.

How would each of the following theories explain the evolution of these long legs?

7 (a) Darwin's theory

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(3 marks)



7 (b) Lamarck's theory.

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(2 marks)

5

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Turn over ►



8 A new fertility treatment that could allow women to have IVF in their lunch hour has been developed.

In standard IVF:

- Eggs are fertilised with sperm in a dish in a laboratory.
- Any resulting embryos are incubated and monitored in a laboratory for three to five days.
- The best embryo is transferred to the woman's womb.

Standard IVF treatment can also be used in cases where the male is infertile. In this treatment a sperm nucleus is injected into an egg. The average success rate for standard IVF treatment is 29.6 per cent.

In the *Invozell* technique:

- The *Invozell* device, shown below, is a sealed capsule that allows fertilisation to take place inside the woman's body, in the vagina.

The photograph of
Invozell device is not
reproduced here
due to third-party
copyright constraints.

- Eggs are removed from the ovaries while the woman is under sedation.
- The eggs and sperm are put into the *Invozell* capsule.
- The capsule is placed inside her vagina.
- After three days the capsule is removed and the best embryo is transferred to the woman's womb.

This IVF treatment can be performed in a doctor's surgery because at no time are eggs, sperm or embryo stored outside the body. No costs are involved for laboratory incubation.

The *Invozell* company tried the technique on 800 women with a success rate of 19.7 per cent.



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Question 4 DR MIKE LAKER, Understanding Cholesterol, Family Doctor Series

Question 7 Photo: © DLILLC/Corbis

Question 8 www.invo-bioscience.com

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