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	
TOTAL	

General Certificate of Secondary Education
Foundation Tier
January 2010

Science B
Unit Biology B1

BLY1F

F

Biology
Unit Biology B1

Written Paper

Thursday 14 January 2010 9.00 am to 9.45 am

For this paper you must have:
- a ruler.

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. Answers written in margins or on blank pages will not be marked.
- 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.

There are no questions printed on this page

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ANSWER IN THE SPACES PROVIDED

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

1 The photograph shows teenagers enjoying burgers and cola at a party.

1 (a) Which part of the body contains receptors which enable a teenager to:

1 (a) (i) see the burgers

.....

(1 mark)

1 (a) (ii) smell the burgers

.....

(1 mark)

1 (a) (iii) taste the burgers?

.....

(1 mark)

Question 1 continues on the next page

1 (b) (i) A teenager drinks a can of sugary cola every day. After a year, he is likely to be 6 kg heavier than a similar teenager who drinks low-sugar cola.

Give **one** reason why.

.....

.....

.....

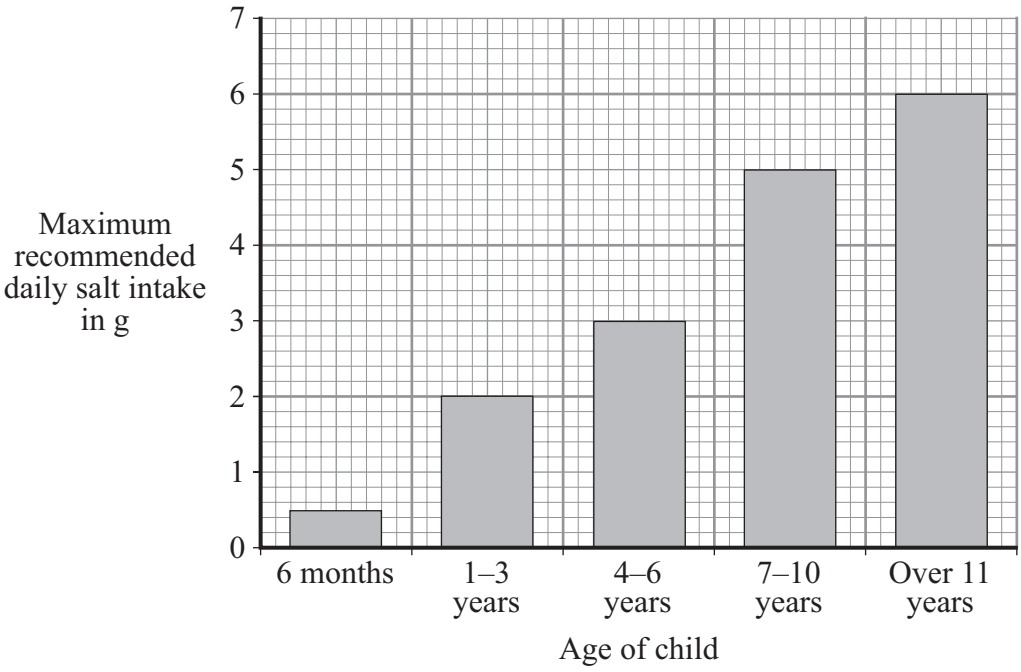
(1 mark)

1 (b) (ii) Name **one** disease linked to obesity.

.....

(1 mark)

1 (c) The graph shows the maximum recommended daily salt intake for children of different ages.



1 (c) (i) What is the maximum recommended daily salt intake for a 6 month-old child?

..... g

(1 mark)

1 (c) (ii) A 6 year-old child has burger, beans and crisps for lunch.

The table shows the mass of salt in each of these foods.

Food	Mass of salt in g
Burger	0.8
Beans	0.9
Crisps	1.4

How much more salt has the 6 year-old child eaten than the maximum recommended daily mass?

Show clearly how you work out your answer.

.....

.....

.....

..... g

(2 marks)

1 (c) (iii) Name **one** health problem linked to too much salt in the diet.

.....

(1 mark)

9

Turn over for the next question

2 The photograph shows a snowy owl.

- The snowy owl lives in the Arctic.
- It eats small mammals such as mice.

How does each of the following adaptations help the snowy owl to survive?

2 (a) Its feathers are white.

.....

.....

(1 mark)

2 (b) It has a thick covering of feathers.

.....

.....

(1 mark)

2 (c) It makes no sound when it flies.

.....

.....

(1 mark)

2 (d) It has long, sharp claws.

.....

.....

(1 mark)

4

Turn over for the next question

3 Vaccines protect us against diseases.

3 (a) Against which **three** diseases does the MMR vaccine protect us?

Tick (✓) **three** boxes.

Malaria ☐

Measles ☐

Meningitis ☐

Mumps ☐

Rabies ☐

Rubella ☐

(3 marks)

3 (b) Draw a ring around the correct word to complete the sentence.

Vaccines cause white blood cells to produce

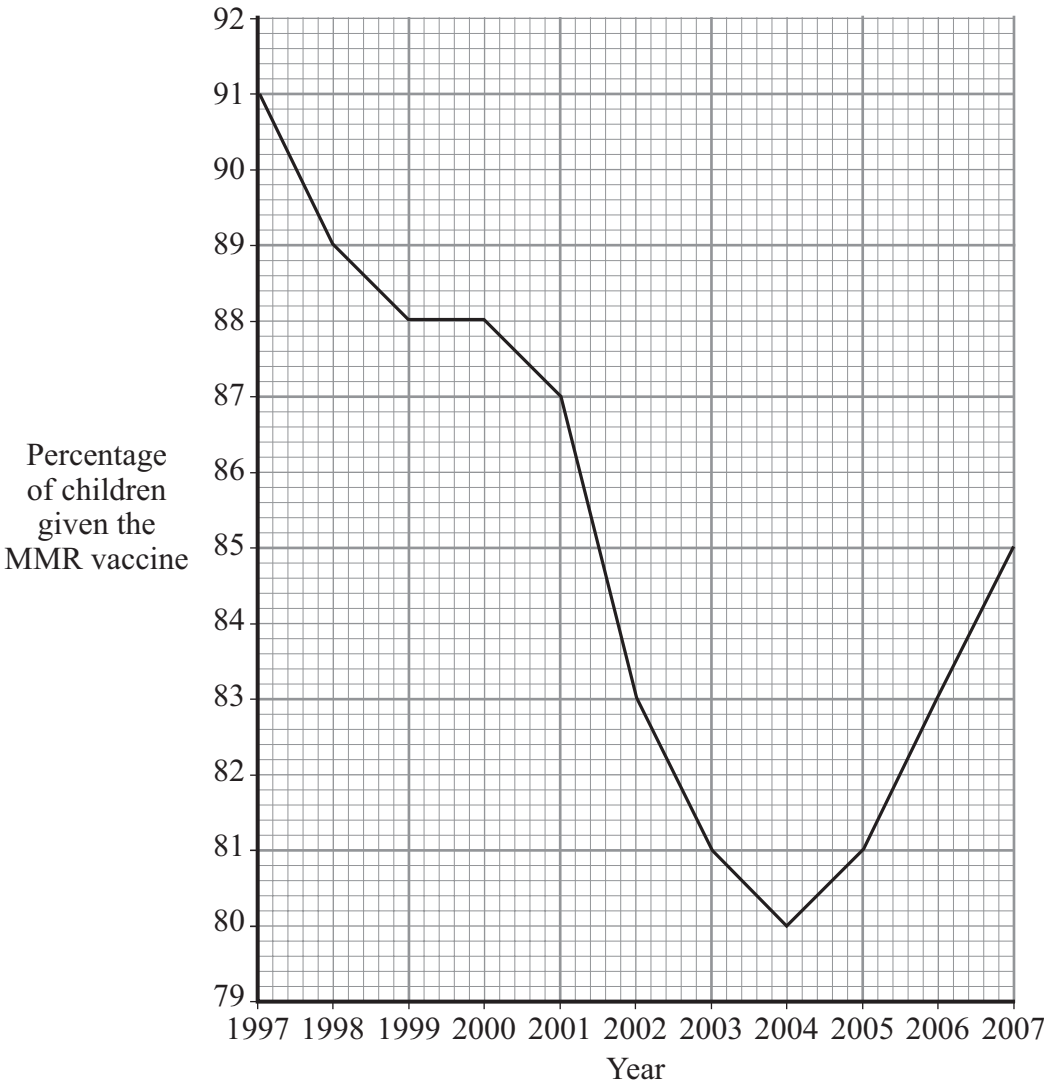
antibodies.

cholesterol.

penicillin.

(1 mark)

The graph shows the percentage of children given the MMR vaccine in the UK between 1997 and 2007.



3 (c) (i) Describe the pattern shown by the data on the graph.

.....

.....

.....

.....

(2 marks)

3 (c) (ii) Suggest **one** explanation for the change in the percentage of children given the MMR vaccine between 1997 and 2004.

.....

.....

(1 mark)

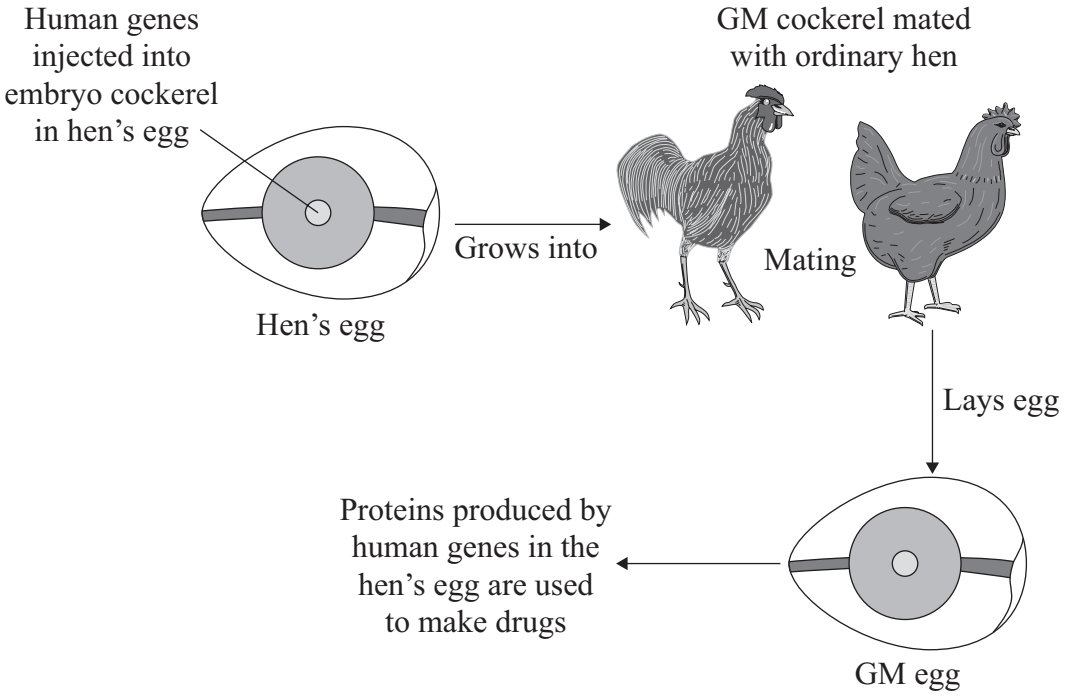
7

Turn over ▶

4 Scientists have discovered how to produce genetically modified (GM) hens' eggs.

Some proteins produced in GM eggs can be used as drugs to treat humans.

The diagram shows how this is done.



4 (a) Which type of reproduction is involved when the cockerel mates with the hen?

Tick (✓) **one** box.

Asexual ☐

Cloning ☐

Sexual ☐

(1 mark)

4 (b) From which part of a human are the genes cut?

Tick (✓) **one** box.

Chromosome ☐

Embryo ☐

Gland ☐

(1 mark)

4 (c) Read the information about genetically modified animals.

- GM animals might escape and breed with wild animals.
- Genetic modification can produce fast-growing animals for food.
- Genetic modification can be used to clone animals in danger of extinction.
- Using GM animals can reduce the number of animals used in medical research.
- Animals have the right to be free from genetic modification.

Use **only** this information to answer these questions.

4 (c) (i) Give **two** reasons why many people are in favour of genetically modified animals.

1 .....

.....

2 .....

.....

(2 marks)

4 (c) (ii) Give **two** reasons why many people are against genetically modified animals.

1 .....

.....

2 .....

.....

(2 marks)

6

Turn over for the next question

5 Medicinal drugs are used to treat diseases.

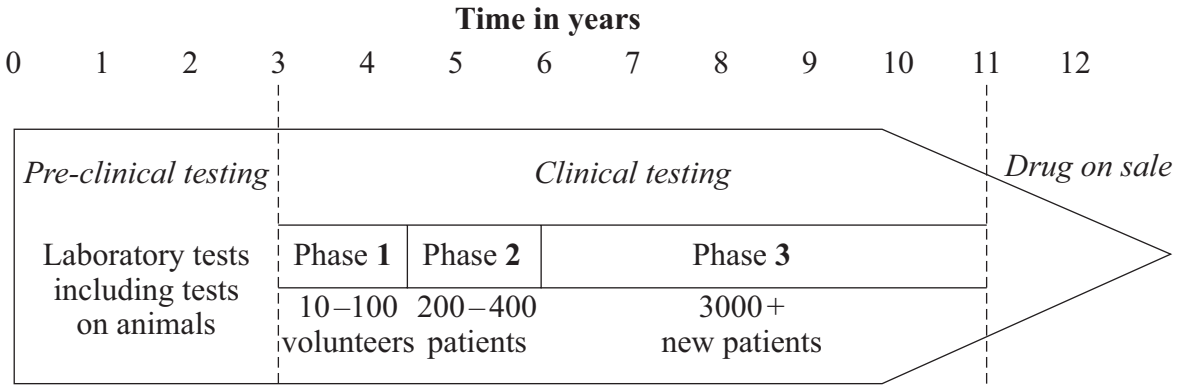
5 (a) Draw **one** line from each drug to its correct use.

Drug	**Use**
Painkiller	Used as a fertility drug
Statin	Used to relieve disease symptoms
Thalidomide	Used to treat leprosy
	Used to lower blood cholesterol

(3 marks)

5 (b) New drugs need to be tested before going on sale.

The diagram shows a time line for the testing of a new drug.



5 (b) (i) How long do trials on humans take? ..... years

(1 mark)

5 (b) (ii) What is the minimum number of humans the drug is tested on throughout *clinical testing*?

.....

(1 mark)

5 (c) Draw a ring around the correct answer to complete each sentence.

5 (c) (i) A new drug is first tested in the laboratory to find

if it is toxic.

if it is cost effective.

the optimum dose.

(1 mark)

5 (c) (ii) The drug is then tested on a few volunteers to find

if it is cost effective.

if it has side effects.

the optimum dose.

(1 mark)

7

Turn over ▶

6 Charles Darwin proposed the theory of natural selection.

6 (a) What is meant by natural selection?

.....

.....

.....

.....

(2 marks)

6 (b) The drawings show stages in the evolution of the human skeleton.

All the drawings are to the same scale.

Ape-like ancestor ⟶ Modern human

Use information from the drawings to describe **two** trends in the evolution of the human skeleton.

1 .....

.....

2 .....

.....

(2 marks)

6 (c) Darwin said that humans had evolved from ape-like ancestors.
Many people disagreed with him at the time.

Give **two** reasons why.

1 .....

.....

2 .....

.....

(2 marks)

6 (d) Lamarck's theory of evolution stated that useful changes which occur in an organism during its lifetime will be inherited by its offspring.

Give **one** way in which Darwin's theory differs from Lamarck's.

.....

.....

(1 mark)

7

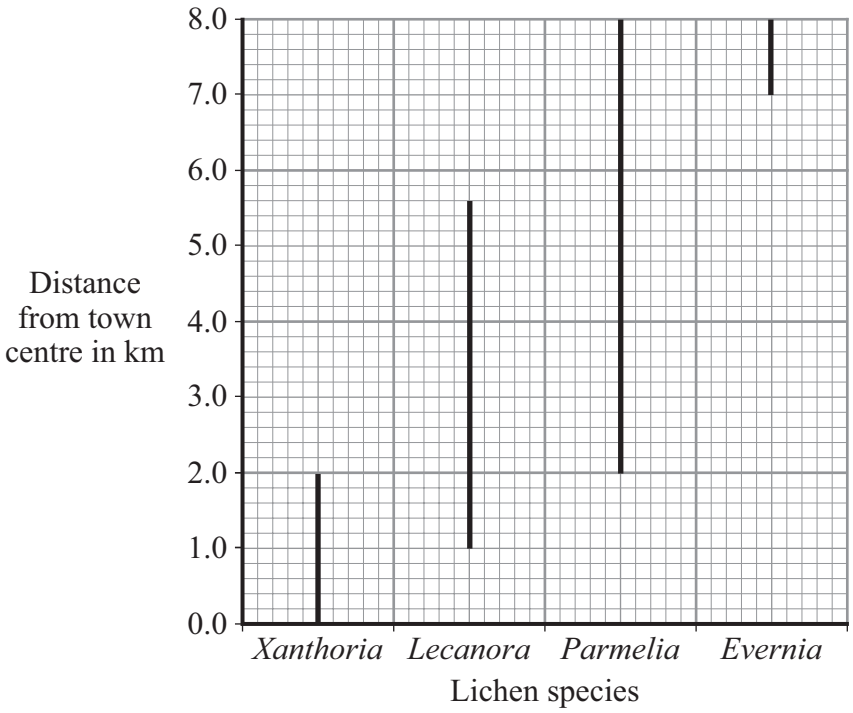
Turn over for the next question

7 Lichens are sensitive to the amount of sulfur dioxide in the atmosphere. They are used as indicator species for the amount of air pollution. Air pollution is generally higher in town centres than in the countryside.

Students investigated the relationship between lichen species and distance from a town centre.

- On a map, they drew a transect (line) from the centre of the town to the countryside.
- They examined sites every 200 metres along the transect (line).
- At each site, they recorded the lichen species growing on trees and walls up to a height of 2 metres.

The graph shows their results.
The lines on the graph indicate the range of each lichen species.



7 (a) Give **one** way in which the students could have obtained more accurate results.

.....

.....

(1 mark)

7 (b) (i) Which lichen species was found over the greatest range?

.....

(1 mark)

7 (b) (ii) Which lichen species grows only in the least polluted air?

.....

(1 mark)

7 (c) One student concluded 'You can tell how much sulfur dioxide there is in the air by the amount of *Lecanora* growing'.

Give **two** reasons why this is **not** a valid conclusion.

1 .....

.....

2 .....

.....

(2 marks)

5

END OF QUESTIONS

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