

Specimen Paper

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										



General Certificate of Secondary Education
Higher Tier

Science A
Unit Biology B1

Biology 1H

Biology
Unit Biology B1

H

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
TOTAL	

For this paper you must have:

- a ruler.

You may use a calculator.

Time allowed

- 60 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 space 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 60.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.
- Question 5 should be answered in continuous prose.
In this question you will be marked on your ability to:
 - use good English
 - organise information clearly
 - use specialist vocabulary where appropriate.

Advice

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

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

1 Hormones regulate the functions of many organs.

Complete the following sentences.

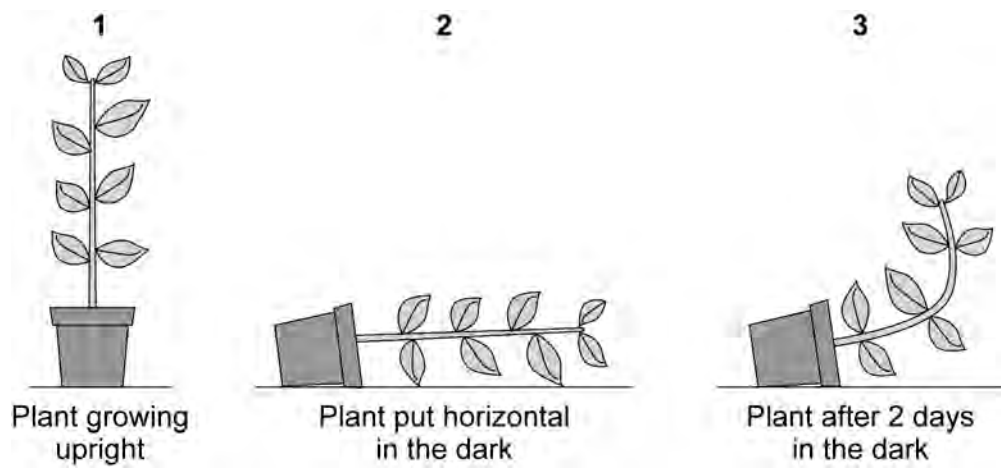
1 (a) Hormones control the monthly release of an egg from the woman's
(1 mark)

1 (b) Hormones also control the thickness of the lining of her
(1 mark)

1 (c) Hormones given to women to stimulate the release of eggs
are calleddrugs.
(1 mark)

3

2 A student grew a plant in an upright pot.
She then put the pot in a horizontal position and left the plant in the dark for two days.
Diagram 3 shows the potted plant after two days in the dark.



Explain fully why the plant responded in this way.

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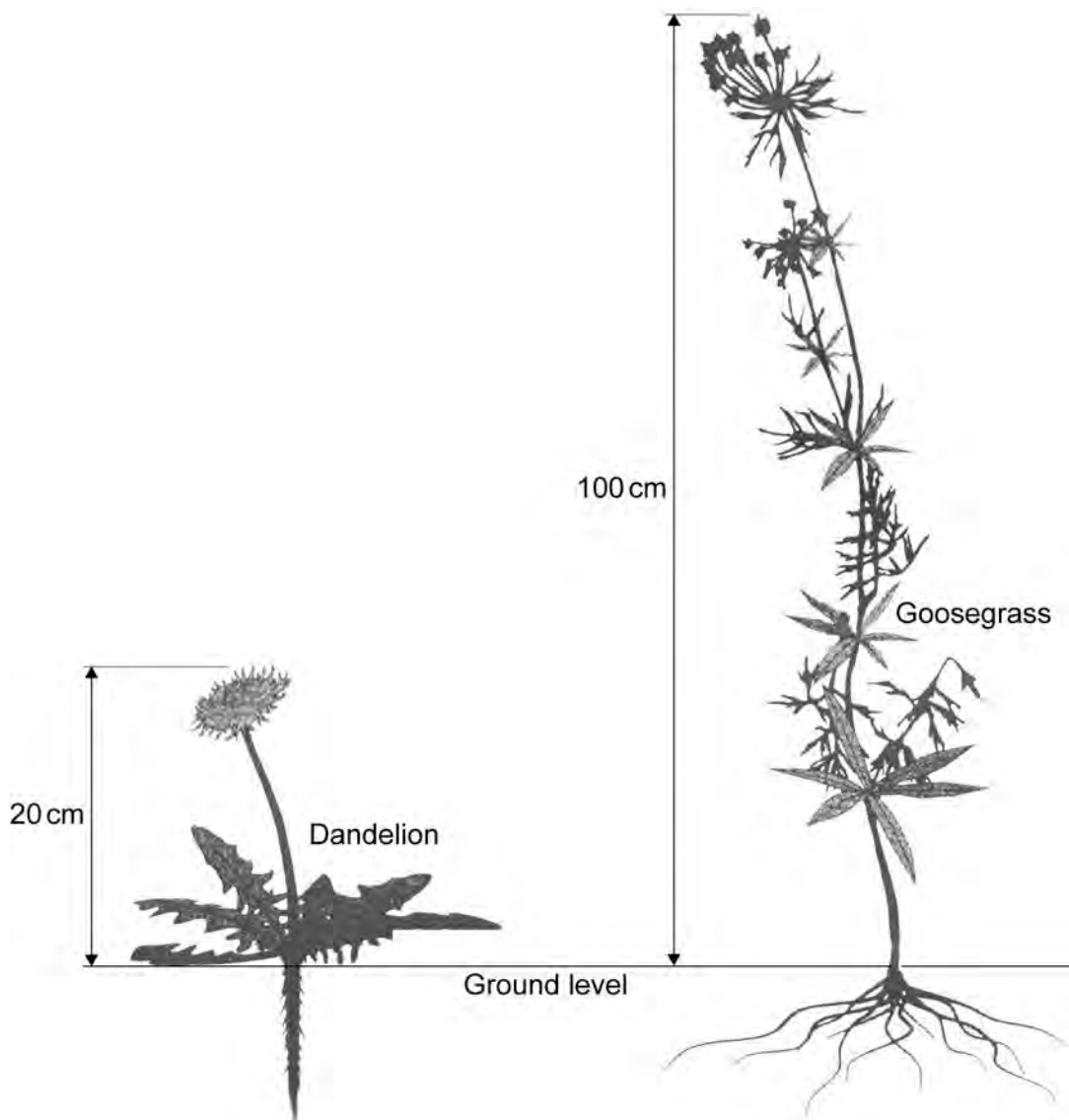
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(4 marks)

4

Turn over ►

3 The drawings show a dandelion plant and goosegrass plant.
The drawings are not drawn to the same scale.



Use the information in the drawings to answer the questions.

3 (a) Explain **one** way in which dandelions are adapted to live in lawns and in fields where animals feed.

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(2 marks)

3 (b) Explain **one** way in which goosegrass is adapted to live alongside hedges.

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(2 marks)

4

Turn over for the next question

Turn over ►

4 Many diseases are caused by viruses. Children are given vaccines to protect them against viral disease.

4 (a) Complete the following sentences.

It is difficult to kill viruses inside the body because

viruses

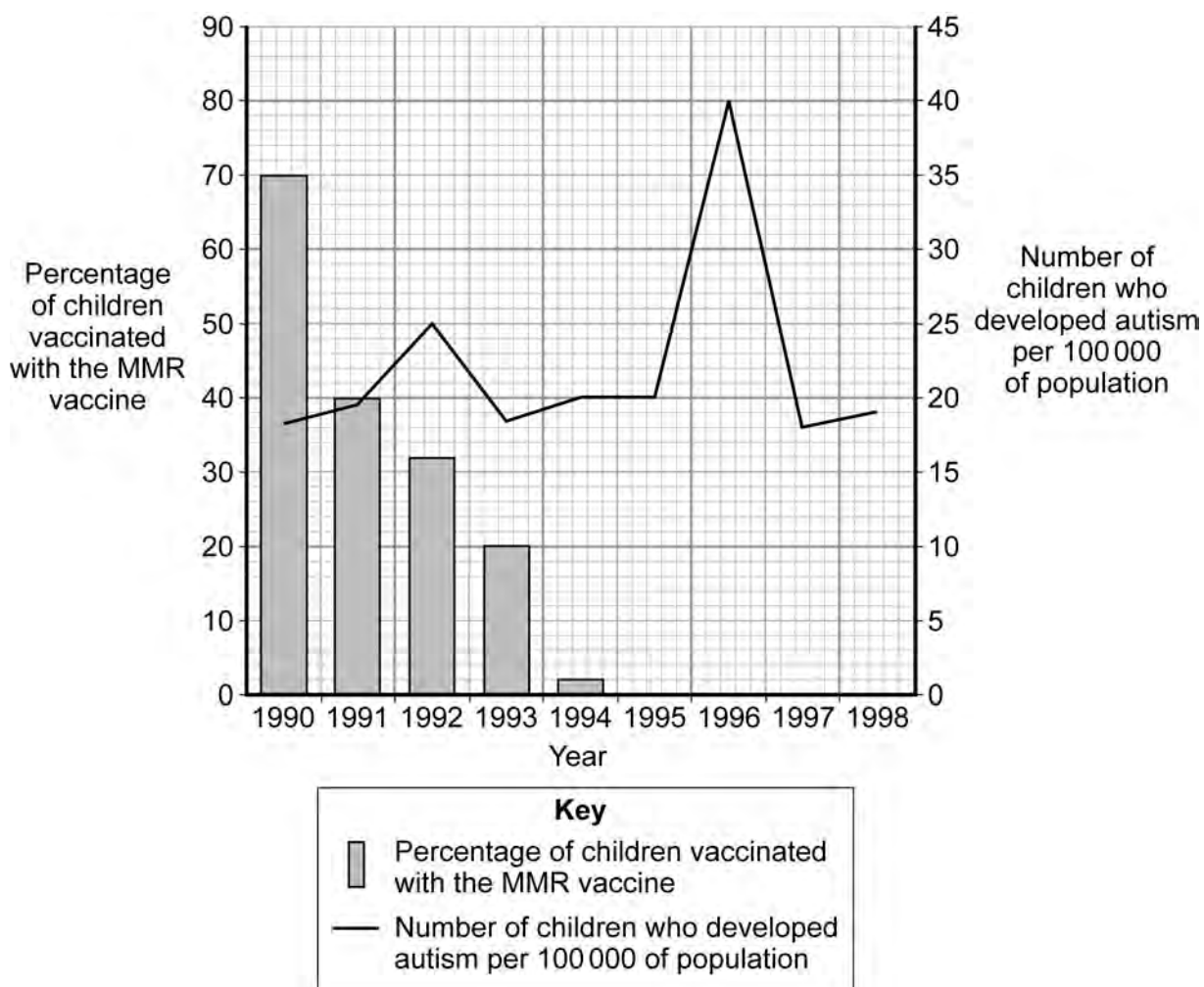
A vaccine contains an form of the virus.

The vaccine stimulates the white blood cells to produce

(3 marks)

4 (b) In the 1990s many people thought that the MMR vaccine caused autism in some children. This is why the Japanese government stopped using the MMR vaccine.

The graph gives information about the percentage of Japanese children who developed autism during the 1990s.



4 (b) The data in the graph support the view that there is no link between MMR vaccination and autism.

Explain why.

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(4 marks)

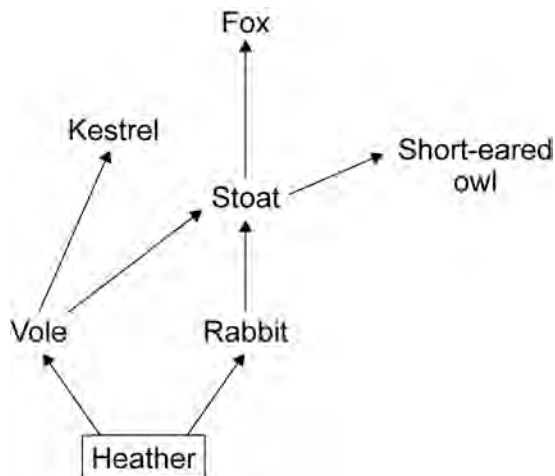
7

Turn over for the next question

Turn over ►

5 In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

The diagram below shows a food web for some of the organisms that live on moorland.



Only a small percentage of the Sun’s energy captured by the heather is eventually incorporated into the body tissues of the fox.

Explain, as fully as you can, what happens to the rest of the energy captured by the heather.

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(6 marks)

6

6 Read the passage about the use of antibiotics in food production.

People do not always agree about the use of antibiotics in food production.

Some farmers put low doses of antibiotics in feed for animals such as cattle and sheep. Antibiotics help to keep animals disease-free. Antibiotics also help animals to grow.

The use of antibiotics in livestock feed means that there is a higher risk of antibiotic-resistant bacteria developing. These could be dangerous to human health.

6 (a) Explain how a population of antibiotic-resistant bacteria might develop from non-resistant bacteria.

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(3 marks)

6 (b) Suggest **two** reasons why it is an advantage to keep farm animals disease free.

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(2 marks)

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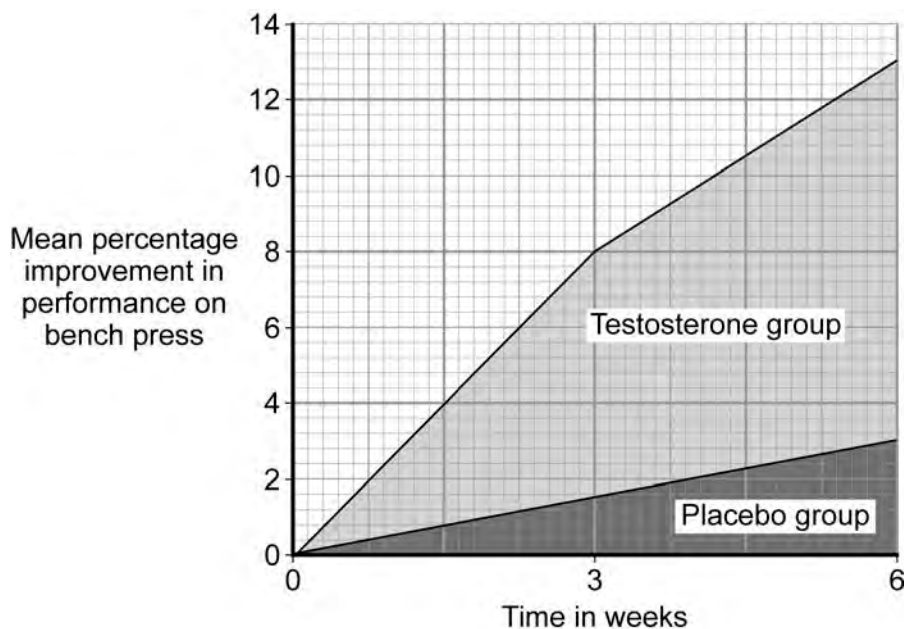
Turn over ►

7 Some athletes use drugs containing the steroid testosterone to improve their performance.

In an investigation:

- scientists monitored the performance of 18 male athletes over a 6 week training programme
- 9 athletes were given weekly injections of testosterone with the dose of 3.5 milligrams per kilogram of body mass, for 6 weeks
- the other 9 athletes were given a placebo
- the athletes' performance on a bench press exercise was measured at 3 weeks and 6 weeks.

The graph shows the results of the investigation.



7 (a) The data would have been better presented as a bar chart.

Give a reason why.

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(1 mark)

7 (b) Suggest what was given as a placebo in this investigation.

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(1 mark)

7 (c) Describe the results of the investigation.

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(2 marks)

7 (d) Most internet advertisements for testosterone state that athletes need to use testosterone for at least 10 weeks to significantly improve performance.

Do the results of this investigation support the statement in the advertisements?

Give **one** reason for your answer.

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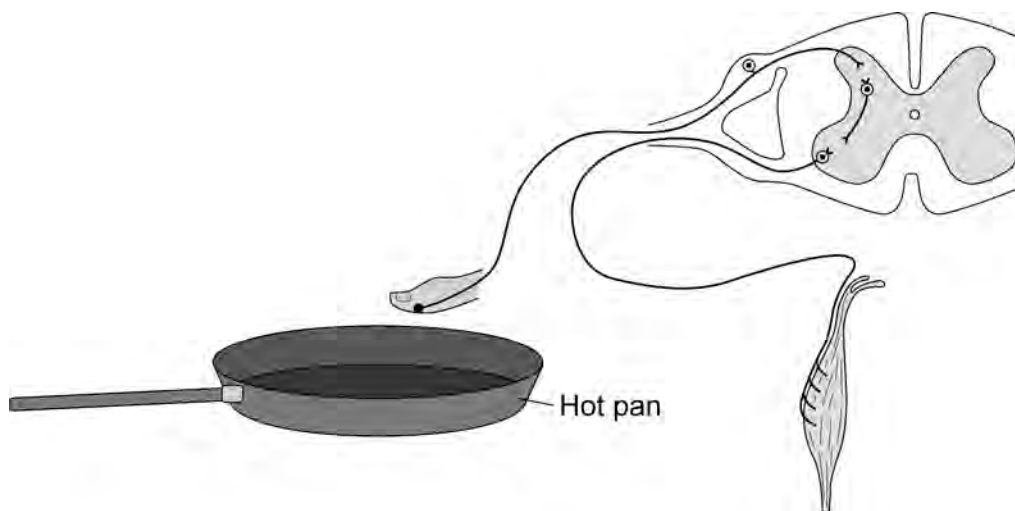
(1 mark)

5

Turn over for the next question

Turn over ►

8 A person accidentally touches a hot pan.
Her hand automatically moves away from the pan.
The diagram shows the structures involved in this action.



8 (a) Describe fully how the structures shown in the diagram bring about this reflex action.

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(6 marks)

8 (b) (i) The nerve pathway in this reflex action is about 1.5 metres in length. A nerve impulse travels at 75 m s^{-1} .

Use this information to calculate the time taken for this reflex action to occur.

Show clearly how you work out your answer.

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Time intervals

(2 marks)

8 (b) (ii) The actual time interval is longer than the interval you have calculated in part (i).

Suggest an explanation for the difference.

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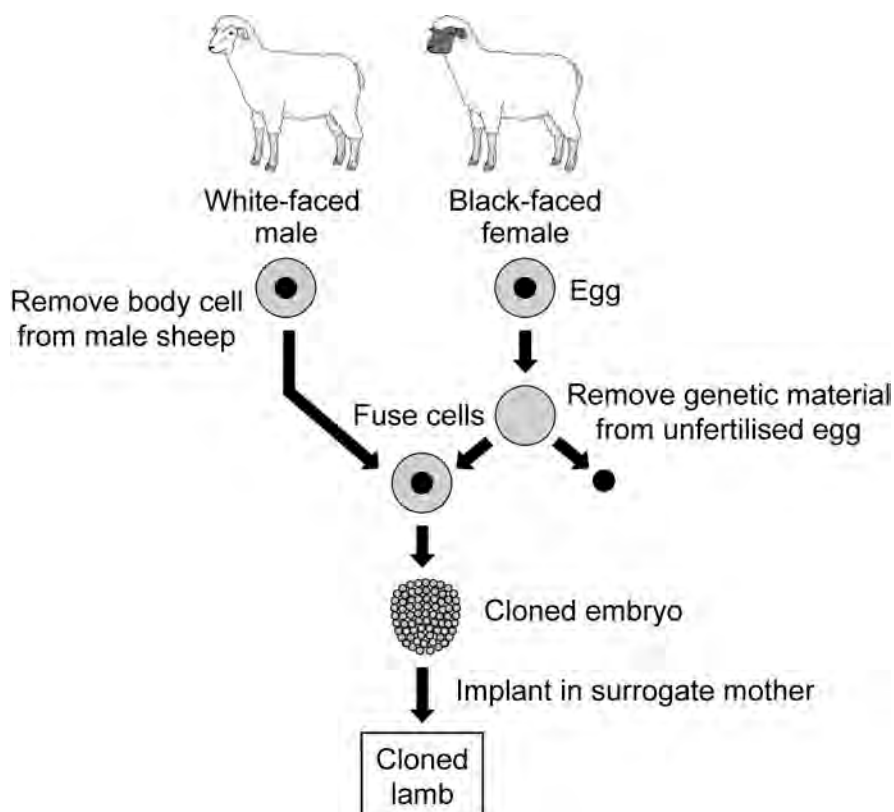
(1 mark)

9

Turn over for the next question

Turn over ►

9 The diagram shows one method of cloning sheep.



9 (a) The fusion of the body cell from the male sheep and the egg from the female sheep is an example of asexual reproduction.

Explain why.

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(2 marks)

9 (b) (i) Give the gender and face colour of the cloned lamb.

Gender

Face colour

(1 mark)

9 (b) (ii) Give the reasons for your choice.

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(2 marks)

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5

Turn over for the next question

Turn over ►

10 The theory of evolution via natural selection was proposed by Darwin.

10 (a) Explain how evolution occurs via natural selection.

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(4 marks)

10 (b) Darwin's theory was only gradually accepted.

Give **two** reasons why.

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(2 marks)

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6

11 Read the information about the trialling of the first contraceptive pill.

The Pill was developed by a team of scientists led by Gregory Pincus. The team needed to carry out large scale trials on humans.

In the summer of 1955, Pincus visited the island of Puerto Rico. Puerto Rico is one of the most densely populated areas in the world. Officials supported birth control as a form of population control. The women in Puerto Rico were mainly poor and uneducated.

The scientists selected a pill with a high dose of hormones. The Pill was found to be 100% effective when taken properly. But 17% of the women in the study complained of side effects.

The women in the trial had been told only that they were taking a drug that prevented pregnancy. They had not been told that the Pill was experimental or that there was a chance of dangerous side effects.

Evaluate the issues involved with methods used by Pincus in trialling the contraceptive pill.

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END OF QUESTIONS

(6 marks)

6

There are no questions printed on this page

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ANSWER IN THE SPACES PROVIDED**

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Question 7 David Cohen, *Steroids boost performance in just weeks*, © New Scientist Magazine 12 August 2004

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