Surname		Other Names	
Centre Number			Candidate Number					
Candidate Signature								

For Examiner's Use

General Certificate of Secondary Education
January 2008

SCIENCE B
Unit Biology B1

BLY1H

H

BIOLOGY
Unit Biology B1

Higher Tier

Tuesday 15 January 2008 1.30 pm to 2.15 pm

For this paper you must have:
- a pencil and a ruler.

You may use a calculator.

Time allowed: 45 minutes

Instructions
- Use blue or black ink or ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- Answer the questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information
- The maximum mark for this paper is 45.
- The marks for questions are shown in brackets.
- 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.

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Question	Mark	Question	Mark
1		3	
2		4	
		5	
		6	
		7	
		8	
Total (Column 1) →			
Total (Column 2) →			
TOTAL			
Examiner's Initials			

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

1 Many people use drugs recreationally.

(a) (i) What is meant by the recreational use of drugs?

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.....

(1 mark)

(ii) Explain why a person might become addicted to a recreational drug.

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(2 marks)

(b) Some people move on from using one type of recreational substance to using another.

Some recreational substances are legal, but some are illegal.

Illegal drugs are classified as Class A, B or C. Class A drugs are the most dangerous.

The table on the opposite page shows government statistics linking the use of pairs of recreational substances.

A '+' in the table shows that there is a strong statistical link between the use of two substances.

For example, people who use solvents are very likely to have used tobacco before using solvents. This is shown by a '+' in the table.

Substance used first	Substance used later									
	Legal substances			Class C drug	Class B drugs			Class A drugs		
	Tobacco	Alcohol	Solvents	Cannabis	Amphetamine	Tranquilliser	Ecstasy	Cocaine	Crack	Heroin
Tobacco		+	+	+	+		+		+	
Alcohol	+		+	+	+	+	+	+		
Solvents				+	+					
Cannabis	+	+			+	+	+	+		
Amphetamine						+	+	+	+	
Tranquilliser			+						+	+
Ecstasy								+		+
Cocaine			+						+	
Crack										+
Heroin									+	

(i) Many people think that using cannabis leads onto using class A drugs.

Does the data in the table support this view?

Draw a ring around your answer. **Yes / No**

Use data from the table to support your answer.

.....

.....

(1 mark)

(ii) What is most likely to lead people to use class A drugs?

Use data from the table to support your answer.

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.....

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(2 marks)

6

2 Copper compounds are found in water that has drained through ash from power stations. Invertebrate animals are used to monitor the concentration of copper compounds in water. First, scientists must find out which invertebrate animals can survive in a range of concentrations of copper compounds.

This is how the procedure is carried out.

- Solutions of different concentrations of a copper compound are prepared.
- Batches of fifty of each of five different invertebrate species, **A**, **B**, **C**, **D** and **E**, are placed in separate containers of each solution.
- After a while, the number of each type of invertebrate which survive at each concentration is counted.

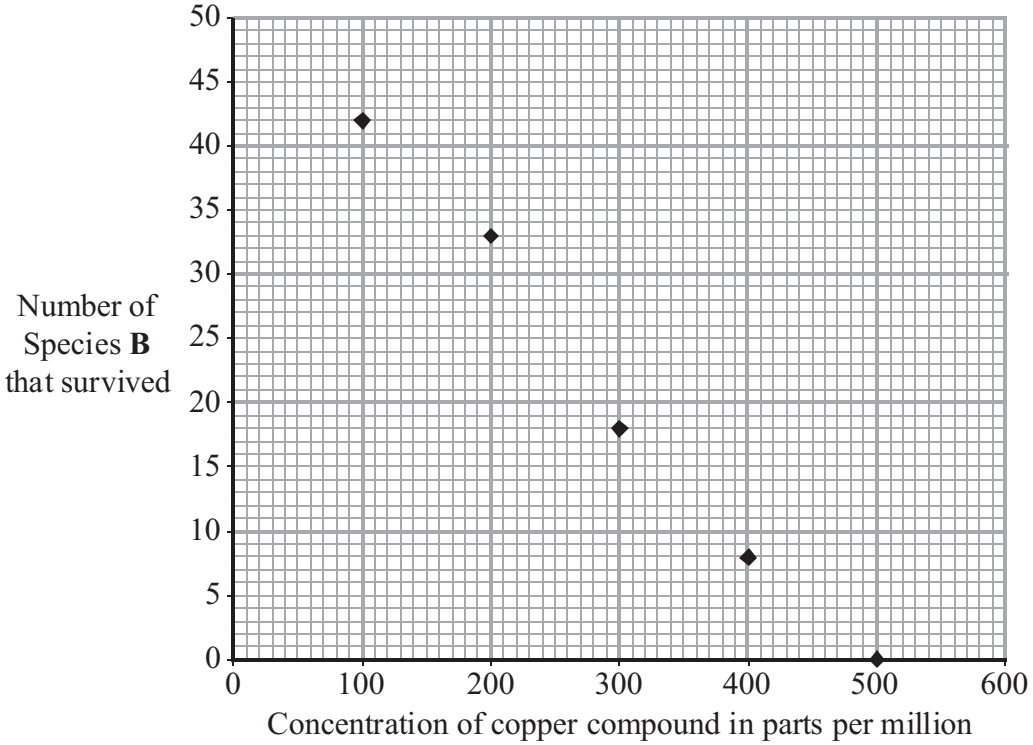
(a) Give **two** variables that should be controlled in this investigation so that the results are valid.

1 .....

2 .....

(2 marks)

(b) The graph below shows the results for species **B**.

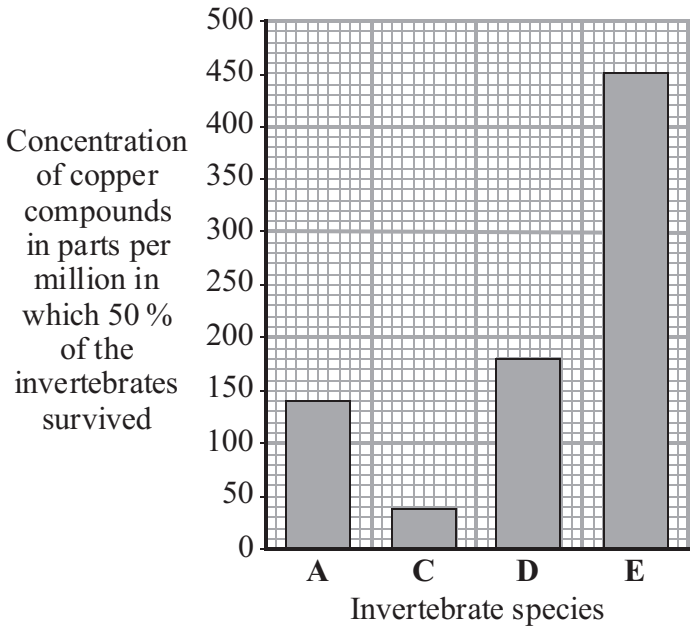


Use the graph to find the concentration of copper compounds in which 50% of Species **B** survived. To obtain full marks you must show clearly on the graph how you obtained your answer.

Concentration ..... parts per million

(2 marks)

(c) The graph below shows the results of the tests on the other four invertebrate species.



(i) Which species, **A**, **C**, **D** or **E**, is most sensitive to the concentration of copper in the water?

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Give the reason for your answer.

.....

.....

(1 mark)

(ii) It is often more convenient to use invertebrates rather than a chemical test to monitor water for copper.

Suggest **one** explanation for this.

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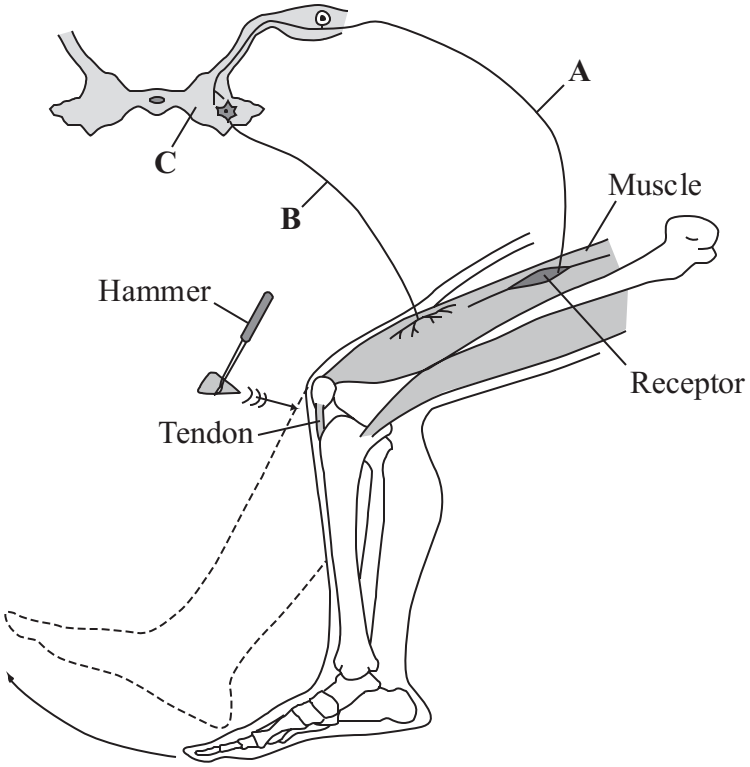
(2 marks)

7

3 The diagram shows the structures involved in the knee-jerk reflex. When the tendon is struck with the hammer, the receptor is stimulated and the lower leg moves forward.



(a) Name the structures labelled **A**, **B** and **C**.

A .....

B .....

C .....

(3 marks)

(b) How is information passed from structure **A** to structure **B**?

.....

.....

(1 mark)

(c) What is the effector in this response?

.....

(1 mark)

5

4 The photograph shows a sand gazelle.

The sand gazelle lives in the Arabian Desert where temperatures often reach 45 °C.

(a) The sand gazelle feeds only at dawn and at dusk. At other times it stays in the shade.

Suggest how this helps the animal to conserve water.

.....

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.....

.....

(2 marks)

(b) During the dry season, the sand gazelle's liver and heart shrink in size.
This reduces the amount of oxygen that the body needs.

Suggest how needing less oxygen helps the animal to conserve water.

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(2 marks)

4

5 The MMR vaccine is used to protect children against measles, mumps and rubella.

(a) Explain, as fully as you can, how the MMR vaccine protects children from these diseases.

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(3 marks)

(b) Read the passage.

Autism is a brain disorder that can result in behavioural problems. In 1998, Dr Andrew Wakefield published a report in a medical journal. Dr Wakefield and his colleagues had carried out tests on 12 autistic children.

Dr Wakefield and his colleagues claimed to have found a possible link between the MMR vaccine and autism.

Dr Wakefield wrote that the parents of eight of the twelve children blamed the MMR vaccine for autism. He said that symptoms of autism had started within days of vaccination.

Some newspapers used parts of the report in scare stories about the MMR vaccine. As a result, many parents refused to have their children vaccinated.

Dr Wakefield's research was being funded through solicitors for the twelve children. The lawyers wanted evidence to use against vaccine manufacturers.

Use information from the passage on the opposite page to answer these questions.

(i) Was Dr Wakefield's report based on reliable scientific evidence?

Explain the reasons for your answer.

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(2 marks)

(ii) Might Dr Wakefield's report have been biased?

Give the reason for your answer.

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(1 mark)

6

Turn over for the next question