

Write your name here

Surname

Other names

Centre Number

Candidate Number

Edexcel GCE

Biology

Advanced

Unit 6B: Practical Biology and Investigative Skills

Wednesday 16 May 2012 – Afternoon

Time: 1 hour 30 minutes

Paper Reference

6BI08/01

You must have:

Ruler, Calculator, HB Pencil

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Write your answers in the spaces provided in this question paper – *there may be more space than you need.*

Information

- The total mark for this paper is 50.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*
- You will be assessed on your ability to organise and present information, ideas, descriptions and arguments clearly and logically, including your use of grammar, punctuation and spelling.
- Any blank pages are indicated.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

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PEARSON

Answer ALL questions.

- 1** The unwanted plants growing in a field of cereal crops are called weeds.

Selective weedkillers can be used on fields of cereal crops. These kill broad-leaved weeds, without harming the cereal plants.

- (a) Describe an experiment to investigate the effect of a new selective weedkiller in a field containing cereal plants and broad-leaved weeds.

(6)

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(b) (i) Suggest **two** abiotic factors that are variables in the investigation.

(2)

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(ii) Choose **one** of the variables from (b)(i). Suggest how this variable could be taken into account or have been controlled. Describe what effect this variable could have had on the results.

(2)

Variable

How the variable could be taken into account or controlled

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Effect of the variable on the results

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(c) Suggest how a selective weedkiller, containing a plant growth regulator such as IAA, may be able to kill broad-leaved weeds.

(2)

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(Total for Question 1 = 12 marks)



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- 2 A student decided to investigate habituation in Giant African Land snails (*Achatina fulica*).



Giant African Land snail, Magnification x0.5

The student selected a snail (A) and placed it on a glass plate across which it was able to move. The student tapped the plate with a glass rod, next to the snail, causing the snail to stop moving and withdraw into its shell. The student recorded the time, in seconds, it took for the snail to re-emerge from its shell and start moving again.

The student tapped the plate at the start of the investigation and then every two minutes for a total of 12 minutes.

The investigation was repeated with two other snails (B and C).

A copy of the raw results for each snail is shown below.

A	90,	40,	30,	10,	0,	0,	2
B	108,	60,	40,	15,	5,	0,	0
C	80,	48,	80,	20,	0,	0,	0

- (a) Write a suitable **null** hypothesis for this investigation.

(1)

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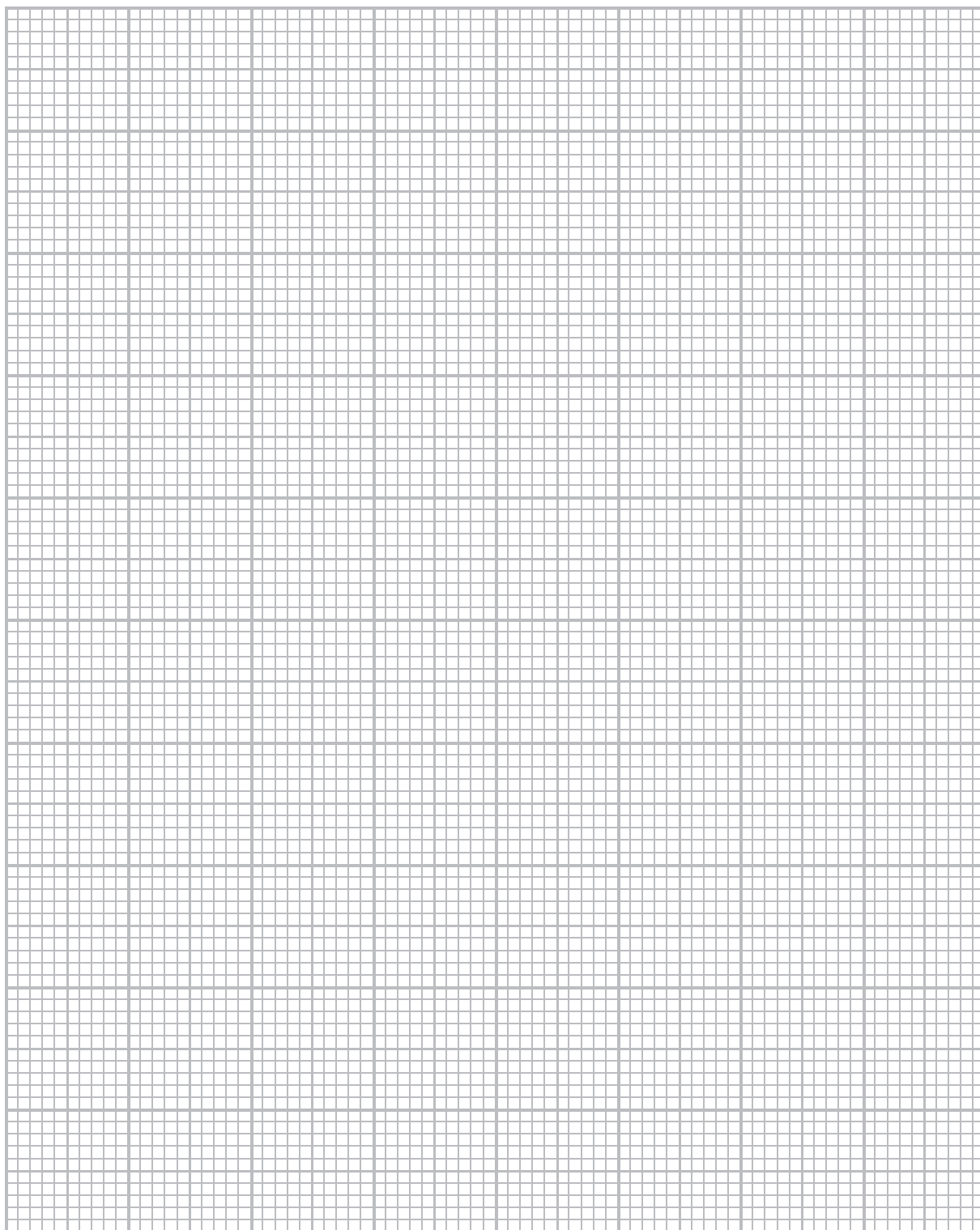
- (b) Calculate suitable means from the raw results and prepare a table to display these and the raw data for this investigation.

(4)



(c) On the graph paper below, draw a suitable graph to show the effect of repeated tapping on the time taken for a snail to start moving again.

(3)



(d) State an anomalous result in the data.

(2)

Give **one** reason for your answer.



- (e) The student used a statistical test to investigate the significance of the correlation between the mean time for the snails to start moving and the repeated tapping. His calculation gave a negative correlation value of 0.93.

The table below shows significance levels and correlation values for this statistical test.

Number of means	Significance level (p)				
	0.50	0.20	0.10	0.05	0.01
4	0.60	1.00	–	–	–
5	0.50	0.80	0.90	–	–
6	0.37	0.66	0.83	0.89	1.00
7	0.32	0.57	0.71	0.79	0.93
8	0.31	0.52	0.64	0.74	0.88
9	0.27	0.48	0.60	0.70	0.83
10	0.25	0.46	0.56	0.65	0.79

What conclusions can be drawn from this investigation?

Use the information provided in the table above and on the graph you have drawn, together with your knowledge and understanding of habituation, to **explain** your answer.

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(Total for Question 2 = 15 marks)



3 Many hospitals and other public buildings now use alcohol-based hand gels to help prevent the spread of infection. These hand gels contain a high concentration of an alcohol (such as ethanol) and a mixture of other components to help thicken and perfume the gel.

Plan an investigation to discover the minimum concentration of ethanol that is needed to inhibit the growth of a specific type of bacterium.

Your answer should give details under the following headings.

(a) A consideration of the safety issues and how you would minimise the risk.

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(b) Suggestions for preliminary work that you might undertake to ensure your proposed method would provide meaningful data.

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(c) A detailed method including an explanation of how important variables are to be controlled or monitored.

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(d) A clear explanation of how your data are to be recorded, presented and analysed in order to draw conclusions from your investigation.

(4)

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(e) The limitations of your proposed method.

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(Total for Question 3 = 23 marks)

TOTAL FOR PAPER = 50 MARKS



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