

6106/02 W2**Edexcel GCE****Biology****Biology (Human)****Advanced****Unit Test 6 Paper 02 W2****Tuesday 28 January 2003 – Morning****Time: 1 hour 20 minutes****Materials required for examination**Answer Book (AB08)
Graph Paper (ASG2)
Ruler**Items included with question papers**

Nil

Instructions to Candidates

In the boxes on the answer book provided, write the name of the examining body (Edexcel), your centre number, candidate number, the subject title, the paper reference, your surname, other names and signature.

The paper reference is shown above.

Answer BOTH questions in the answer book.

Show all the steps in any calculations and state the units. Calculators may be used.

Include diagrams in your answers where these are helpful.

Additional answer sheets may be used.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. (2).

The total mark for this paper is 32.

Advice to Candidates

You must ensure that your answers to parts of questions are clearly numbered.

You will be assessed on your ability to organise and present information, ideas, descriptions and arguments clearly and logically, taking account of your use of grammar, punctuation and spelling.

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Answer BOTH questions

1. Auxins are plant growth substances which can cause elongation in developing plant tissues.

A student formed the hypothesis that an increase in the concentration of auxins would increase the elongation of seedling tissue. To test this idea he cut twenty 15 mm lengths from identical oat seedlings and immersed ten of them in a solution of $1 \mu\text{g dm}^{-3}$ auxin and ten in a solution of $10 \mu\text{g dm}^{-3}$ auxin.

These samples were left in controlled conditions for 12 hours, after which they were removed and their lengths re-measured.

An extract from his laboratory notebook is shown below.

$1 \mu\text{g dm}^{-3}$				
all 15 mm				
remeasured lengths				
22	25	24	23	22
20	25	24	23	24
$10 \mu\text{g dm}^{-3}$				
all 15 mm				
Remeasured lengths				
25	28	26	27	25
26	29	24	26	23

- (a) Prepare a table and organise the data in a suitable way so that the increase in length in each concentration can be compared. (4)
- (b) Use the data in your table to present the information in a suitable graphical form. (3)
- (c) State a suitable null hypothesis for this investigation. (1)
- (d) The student applied a t -test to his data to test his hypothesis.

He calculated the value of t to be 3.68.

The table below shows the critical value of t with 18 degrees of freedom for various significance levels.

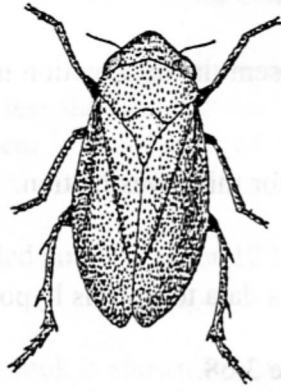
Significance level (%)	20	10	5	2	1
Critical value of t	1.33	1.73	2.10	2.55	2.80

What conclusions can be drawn from this investigation? Use the information provided to explain your answer.

(3)

(Total 11 marks)

Froghoppers, such as the one shown below, are small insects that feed on soft-stemmed plants.



Froghopper (3–11 mm)

Plan an investigation, which you personally could carry out, to test the hypothesis that coppicing (cutting down trees to leave a stump) of a woodland increases the number of froghoppers.

Your answer should be given under the following headings.

- (a) Plan of the investigation to be carried out. (10)
- (b) Recording of raw data measurements, presentation of results and methods of data analysis. (6)
- (c) Limitations of your method and an indication of further work that could be undertaken. (5)

(Total 21 marks)

TOTAL FOR PAPER: 32 MARKS

END