

**MATRICULATION AND SECONDARY EDUCATION CERTIFICATE EXAMINATIONS BOARD
UNIVERSITY OF MALTA, MSIDA**

**MATRICULATION CERTIFICATE EXAMINATION
ADVANCED LEVEL
SEPTEMBER (SUPPLEMENTARY) SESSION 2003**

Subject Title	BIOLOGY
Paper No./Title	Paper 4 (Practical)
Date	September 2003

Directions to Candidates

- *Write your index number in the space at the top right-hand corner of this page.*
 - *Answer ALL questions. Write all your answers this answer booklet. Drawings of biological material and graphical representations of data are to be made on the appropriate pages within this booklet.*
 - *The mark allocation is indicated at the end of each question. Marks allocated to parts of questions are also indicated.*
 - *You are reminded of the necessity for good English and orderly presentation in your answers.*
 - *In calculations you are advised to show all the steps in your working, giving your answer at each stage.*
 - *The use of electronic calculators is permitted.*
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For examiners' use only:

Question	1	2	3	Total
Score				
Maximum	20	30	30	80

ADVANCED BIOLOGY IV (Practical)

1. You are provided with specimens **A, B, C** and **D**:

1.1 For each of specimens A, B, C and D, name **TWO** major taxonomic groups (any two from Kingdom, Phylum/Division and Class) within which the organism is classified. Write your answers in the table below:

	First major taxonomic group	Second major taxonomic group
Specimen A		
Specimen B		
Specimen C		
Specimen D		

[four marks]

1.2 For each of specimens A, B, C and D, list those structural features **visible in the specimen provided** which are diagnostic of the particular phylum or division to which it belongs.

Specimen A:

Specimen B:

Specimen C:

Specimen D:

[eight marks]

ADVANCED BIOLOGY IV (Practical)

1.3 Select any **TWO** specimens from **A, B and C** (do not use specimen D for this part of the exercise) and:

(a) Comment on the probable mode of life of the organisms you have selected as indicated by their visible structural adaptations.

[three marks]

(b) Compare and contrast the visible structural adaptations of the two organisms you have selected.

[three marks]

1.4 Write brief notes on the structural features visible in Specimen D.

[two marks]

[Total: twenty marks]

ADVANCED BIOLOGY IV (Practical)

2. Examine the external and internal features of the biological material provided. Draw clear, carefully labelled and annotated figures to illustrate these features. Use the space provided in the box below and in any of the blank spaces on the following pages for your drawing.

[Total: thirty marks]

Title:

ADVANCED BIOLOGY IV (Practical)

Blank space to be used in conjunction with Question 2.

Title:

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Blank space to be used in conjunction with Question 2.

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Blank space to be used in conjunction with Question 2.

Title:

ADVANCED BIOLOGY IV (Practical)

3. You are provided with two sets of leaves from two different plants. The sets are labelled as Sample A and Sample B. The plants in question are superficially similar but are nevertheless classified as separate species by some authorities.
- 3.1 Use the Vernier callipers provided to measure the length and maximum breadth of each leaf. Present your results in tabulated form. Construct your table in the blank space below:

[five marks]

- 3.2 Summarise your results in the table below:

	Mean length	Mean of maximum breadths	Range of lengths	Range of maximum breadths
Sample A				
Sample B				

[five marks]

ADVANCED BIOLOGY IV (Practical)

3.3 Use the data obtained in your answer to question 3.1 to construct a scatter diagram with leaf length on the y-axis and maximum leaf breadth on the x-axis. Label each point with the symbol A or B according to the sample it originated from. **Use the squared paper at the end of this answer booklet.**

[six marks]

3.4 Comment on pattern of scatter obtained.

[four marks]

3.5 Would you consider the leaves in Sample A and Sample B to represent a single species or two different species? Use the results you have obtained to justify your answer.

[four marks]

3.6 Name a statistical test that may be used for supporting the conclusion you suggested in your answer to question 3.5. Justify your choice of statistical test.

Name of test: _____

Justification: _____

[three marks]

ADVANCED BIOLOGY IV (Practical)

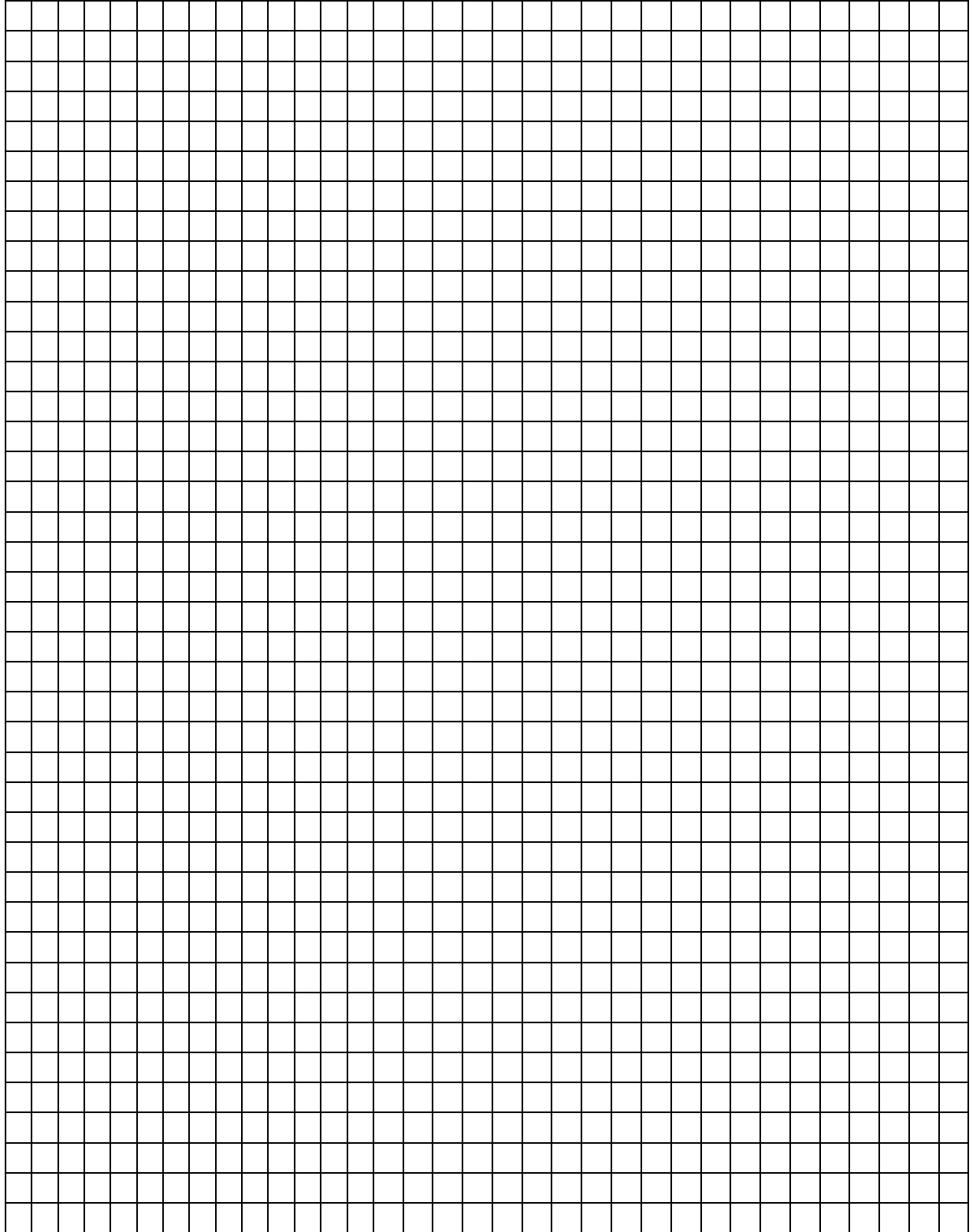
3.7 Briefly outline the principal shortcomings of this investigation. Suggest any modifications that may provide more reliable results.

[three marks]

[Total: thirty marks]

ADVANCED BIOLOGY IV (Practical)

Squared paper to be used in conjunction with Question 3.



ADVANCED BIOLOGY IV (Practical)

Squared paper to be used in conjunction with Question 3.

