



Examiners' Report

Principal Examiner Feedback

January 2019

Pearson Edexcel International Advanced Level
In Biology (WBI06)

Practical Biology and Investigative Skills

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Introduction:

In general candidates showed a good knowledge of the core practical methods. Clearly identified variables that needed to be controlled but their descriptions as to how the control could be achieved lacked the precision required for this examination. Candidates were often competent at interpreting the results of the statistical test. Most candidates did try to tailor their answers to the given context of each question.

Question 1

Question 1(a)

This question was based on the mineral deficiency core practical.

Many answers indicated that candidates had carried out this type of investigation. Candidates often referred to controlling a suitable variable but the explanations as to how this could be control were not always worthy of credit. Some candidates did not make it clear that measurements for each treatment should be repeated to find the mean.

Question 1(b)(i)

Most candidates stated one correct abiotic variable and many also provided as suitable biotic variable.

Question 1(b)(ii)

Candidates were then asked to choose one of the variables they had identified and explain how it could be controlled. Many candidates selected an appropriate variable however, the description of a control method was not always worthy of credit. Most candidates gave suitable descriptions as to why the results would not be valid if the variable was not controlled.

Question 1(c)

Candidates were asked to suggest why zinc deficiency limits the growth of maize plants. Nearly all the candidates suggested that photosynthesis would be reduced. However, many candidates did not go on to link this to reduced plant growth.

Question 2

The context of this question was the response of a snail to repeated stimulation.

Question 2(a)

The majority of candidates wrote a clear null hypothesis that gained both marks.

Question 2(b)

Most candidates presented the data in a clear table. In some cases the full headings from the information given were not included. A small number of candidates made errors in calculating the means.

Question 2(c)

Most candidates presented clear graphs with both axes fully labelled. The plotting was usually easily checked as a sensible scale was chosen in most cases. If a candidate had calculated incorrect means in part b they could still be awarded the plotting mark here as an error carried forward. Only a very small number of candidates failed to include range bars on their graphs.

Question 2(d)

Most candidates correctly identified the critical value of 0.427 from the table and correctly compared this with the calculated value of r . A small number of candidates made the mistake of suggesting that because the calculated value had a negative value it must be smaller than 0.427. They then accepted the null hypothesis and suggesting there was no significant correlation. Negative values should be ignored for the purpose of judging significance.

Question 2(e)

Most candidates identified the small sample size as a reason why the investigation might not be valid. Many candidates also suggested at least one further reason why the investigation might not be valid.

Question 3

This question was centred on the action of plant growth regulators.

Question 3(a)

Nearly all the candidates suggested at least one appropriate safety issue.

Question 3(b)

Candidates were asked to describe preliminary work to ensure a proposed method would work. The candidates that had engaged with the context of the investigation gave good descriptions that covered at least three of the points on the mark scheme. Some answers were only given credit for the idea of practising the method to see if it works.

Question 3(c)

Nearly all the candidates described a method of their investigation in a logical sequence. All the marking points were seen in at least some answers. Candidates identified variables to be controlled and usually suggest a method of control as well. In some answers the statement about repetition was not clearly stated for each experimental treatment.

Question 3(d)

Candidates were asked to explain how the data from their investigation would be recorded presented and analysed. Most candidates either described or drew tables with headings and graphs with labelled axes. However, some table headings were not worthy of credit as they did not record raw data in any section. Only a small number of students suggested a statistical test that was not a suitable correlation test.

Question 3(e)

The candidates that considered the limitations for *their proposed* method usually identified at least one limitation outlined in the mark scheme.

Paper summary:

Advice for students:

- Read the whole question before you start to answer, and check that your answer covers everything the question asks for.
- Make sure your answer relates to the specific context of the question.
- When studying Core Practicals, think about what the techniques might be used for and the types of scientific question they might help to answer.
- Carry out every Core Practical for yourself, so you understand how it works and any difficulties that might be encountered.
- If you are given the procedure for a practical technique, put yourself in the shoes of the person writing the procedure: how would they have worked out the details (such as volumes, concentrations and times)? They will have used preliminary practical work.
- Consider the strengths and limitations of each Core Practical technique.
- Practice writing null hypotheses for experiments you carry out, even if you will not necessarily be applying a statistical test.

