Examiners' Report

Principal Examiner Feedback

January 2021

Pearson Edexcel International Advanced Level

In Biology (WBI16)

Paper 01 Practical Biology and Investigative Skills

Introduction
This was only the second paper testing the new specification and the paper followed a similar format to past papers. However, there were mark distribution differences in each question.

Question one always asks candidates to describe a method based on a core practical they are expected to have personally carried out.

Question two can be based around any biological context, the key parts of the question are always the same, data presentation and analysis.

Question three is based on a core practical, the context should be familiar. This question focused on data processing and points of methodology.

Question four is based on a core practical.

In general, candidates showed knowledge of the core practical methods. Students clearly identified variables that needed to be controlled but their descriptions as to how the control could be achieved frequently lacked the precision required for this examination. However, most students did try to tailor their answers to the context of each question.

Question 1

1a
Candidates were asked to describe a method to investigate the effect of a stigma extract on the rate of pollen tube growth. All the marking points were given by at least some candidates. There were only infrequent references to the need to use a microscope to measure the length of a pollen tube or how to calculate the rate of growth.

1b
This question asked students to describe how pectin is produced at the tip of a pollen tube. Most candidates appreciated that starch would be a source of glucose and were able to describe a sensible sequence of events. Unfortunately, a small number of candidates confused pectin with amylopectin.

Question 2
The context of this question was the respiration of invertebrates.

2ai
Many candidates correctly calculated the mean rate of oxygen uptake. However, a minority of candidate did not express their answer to two significant figures.

2aii
A significant number of candidates did not use their data to calculate RQ as they did not recall the formula correctly.

2aiii
Most candidates stated the function of soda lime correctly, but they often failed to give any further explanation for the need to use glass beads so that the volume of carbon dioxide could be measured and then RQ calculated.

2bi
Most candidates stated at least one biotic variable.

2bii
Many candidates described their control of a variable adequately. Some candidates gave very vague or incomplete statements that could not be given credit.

Question 3
This question was about investigating the effect of antibiotic resistance.

3a
Most candidates stated an appropriate null hypothesis. However, some statements had omissions and could not gain credit.

3bi
Most candidates presented the data in a clear table. In a few cases the full headings from the information given were not included and units were repeated in one or more columns. Some candidates did not present both means to one decimal place.

3bii
Most candidates presented graphs with both axes fully labelled. The plotting was usually easily checked as a sensible scale was chosen in most cases. If a student had presented incorrect means in part b, they could still be awarded the plotting mark here as an error carried forward. Only a small number of students failed to include any range bars on their graphs.

3biii
Most candidates worked through the given formula, usually with success although there were some errors made during the process.

3biv
Most candidates correctly identified the critical value from the table and compared this with the calculated value of *t*. However, only a minority of candidates considered whether the scientist had made a correct statement using evidence from the data.

3c
Nearly all candidates correctly identified one limitation of this investigation.

This question was about investigating the effect of ABA on the production of amylase.

4a
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 descriptions that covered at least one of the points on the mark scheme.
Candidates were not given credit for the idea of practising the method to see if it works unless they provided some specific details.

4b
Nearly all the candidates described a method of their investigation in a logical sequence. However, a significant number of answers had the potential to gain more marks by making clear statements, for example, specifying exactly how to control a variable.
All the marking points were seen regularly and there were a significant number of good answers gaining maximum marks.

4c
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. Only a small number of students suggested a statistical test that was not a suitable correlation test.

4d
Most candidates suggested at least one of the points on the mark scheme.

Students are advised to:

- 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.