Pearson Edexcel

Examiners' Report

Principal Examiner Feedback

January 2024

Pearson Edexcel International Advanced Level In Biology (WBI16)
Paper 01: Practical Skills in Biology II

Question 1 asked candidates to consider the practical aspects of an investigation of the antibacterial effect of plant extracts.

Question 2 was based on ai investigation of pollen tube growth. This question focused on a detailed data processing and the control of variables.

Question 3 can be based around any biological context, the key parts of the question are always the same, data presentation and analysis.

Question 4 is based on a core practical, investigating the rate of respiration of germinating seeds.

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 investigation.

Question 1

1a Candidates were asked to describe how different parts of the plant could be compared for antibacterial activity. The descriptions were usually sound and well answered. Many candidates did not clearly state which parts of the plant they were going to use in the extraction process as the first marking point. All the points on the mark scheme were seen regularly.

1bi Candidates were asked to state the meanings of the terms bacteriostatic and bacteriocdal antibiotics. Most candidates showed a clear understanding of one or both terms.

1bii Most candidates showed some knowledge of the code of practice for prescribing antibiotics. The risk of creating bacterial resistance was often clearly expressed.

Question 2

2a Most candidates correctly calculated the rate of growth of pollen tubes and use the correct units. A small number divided by 5 instead of 4.

2b Most candidates made a reasonable attempt to explain how temperature might affect the growth of pollen tubes. The description of changes in enzyme action were sometimes too vague to gain credit. Comments on increasing the length of the tube by laying down more molecules were only occasionally seen.

2ci, ii ,iii Most candidates correctly identified relevant variables, and gave suitable method of control a variable.

2d Very few candidates suggested collecting pollen and storing it under the same condition for different periods of time before making slides or collecting pollen each day from the same flower. The need to keep all the other variables the same as the first investigation was not always clearly stated.

Question 3

3a The majority of candidates did state a null hypothesis that had sufficient detail to gain the mark.

3b-c Nearly all the candidates presented appropriate tables and bar graphs.

The units were sometimes missing from the tables. Bar graphs should have a y axis starting at zero, this axis label was frequently not complete as mean and units were missing.

3di Most candidates worked through the given formula and correctly calculated the value of *t* using the mean values substituted in the formula.

3dii Most candidates correctly identified the critical value from the table and compared this with the calculated value of *t*. The explanations that followed were usually worthy of credit. Negative values were sometimes stated, in which case correct reasoning gained credit.

3e Candidates found it difficult to describe extensions that were appropriate to this investigation. However, all the marking points were given by the candidates that thought about extending the investigation.

Question 4

4a The context of this question was that tetraploid melon seeds had a higher RQ that diploid melon seeds. 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.

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 statistical test for the raw data they envisaged collecting. Tables should only have headings with units for raw data. A heading RQ was not appropriate as it is a calculated value rather than raw data.

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

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.