Examiners' Report
Principal Examiner Feedback

October 2024

Pearson Edexcel International Advanced Level In Biology (WBI16) Paper 01

Practical Skills in Biology II

INTRODUCTION

Question one asked candidates to consider the practical aspects of an investigation of the effect of gibberellins on the synthesis of amylase by wheat grains. Question two was based on the tensile strength of plant fibres. This question focused on a detailed data processing and the control of variables. Question three can be based around any biological context, in this case mitosis, the key parts of the question are always the same, data presentation and analysis. Question four is based on a core practical, investigating the rate of photosynthesis of pondweed at different depths of water.

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 state why germinating seeds produce amylase. Many candidates correctly identified the role of this specific enzyme.

1b Candidates were asked to describe a method to investigate if gibberellin stimulates the endosperm or the embryo of a wheat grain to produce amylase.

Candidates described separating the grain into two different tissues but then frequently discarded one half rather than applying the same method to both halves. The need for starch in the agar medium was often omitted. Comparison of the relative digestion of starch on the agar plates was often lacking and sometimes confused with the zone of inhibition.

1c Most candidates showed some knowledge of the mechanism of stimulating the synthesis of amylase by gibberellins. However very few candidates gained all three marks as the descriptions lacked some of the detail required by the mark scheme.

Question 2

2a Most candidates correctly identified a risk and gave a suitable method of reducing the risk. Some descriptions, however, lacked the clarity needed to gain credit.

2b Most candidates calculated the mean tensile strength correctly from the results presented. Unfortunately, a significant number of candidates did not calculate the increase in tensile strength.

2ci Most candidates correctly identified relevant variables and gave suitable method of control one variable.

2d Many candidates described the structure of sclerenchyma fibres. There were some answers that described other plant cell types.

Question 3

3a The majority of candidates stated 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 and means not given to the same number of decimal places. Bar graphs should have a y axis starting at zero, this axis label was frequently not complete as mean and units were sometimes missing. Most candidates plotted range bars correctly.

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 this investigation.

Question 4

4a The context of this question was that the photosynthesis of pondweed may be affected by the depth below the water surface. 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 that included many of the marking points. However, some 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. A table should record raw data, so a heading, rate of photosynthesis is inappropriate. Graphs with labelled axes were sketched but in some answers the type of graph was not clearly identified in the sketch or in text. Only a small number of students suggested a statistical test that was not suitable for the raw data they envisaged collecting.

4d Many candidates only suggested generic limitations of their proposed method that lacked focus on the context of the investigation. The candidates that thought carefully about the investigation described the points on the mark scheme.

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.