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Examiners' Report  
Principal Examiner Feedback

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

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## **Introduction**

Question one asked candidates to consider the practical aspects of an investigation of the effect of copper ions on the hatching of brine shrimps.

Question two was based on an investigation of the association of termite mounds and the fruiting of Acacia trees. This question focused on a detailed data processing and the control of variables.

Question three was based around the habituation of sea slugs, 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 respiration of blow fly larvae fed on different substrates.

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**

**1(a)** Candidates were asked to describe how to investigate the effect of different copper ion concentrations on the hatching rate of brine shrimps. The descriptions were usually sound and well answered. Some candidates gave details in their method that clearly demonstrated they had worked through the core practical. All the points on the mark scheme were seen regularly.

**1(b)** Nearly all candidates gave a sensible response to suggest why using brine shrimps did not raise ethical concerns.

**1(c)** Most candidates showed some knowledge of enzyme inhibition, however, only a minority gained maximum marks.

## **Question 2**

**2(a)** Candidates often find ecology investigations a challenge. There is a temptation to give generic descriptions of transects and quadrats without consideration of the specific context described.

An individual method described rarely gained four marks, however, all the points on the mark scheme were seen.

**2(b)(i)** and **ii** Many candidates filled in the table for expected values incorrectly. Using incorrect expected values, they made a reasonable attempt to calculate the value of chi squared and gained one mark for correct working of the formula.

**2(b)(iii)** Only a very small number of candidates could give a reason why the student chose the chi squared test to analyse the data.

Candidates should be able to select a statistical test that is appropriate for the type of data being collected.

**2(b)(iv)** Most candidates correctly identified relevant variables.

**2(c)** Most candidates understood the role of nitrate ions in the life of plants. The question asked candidates to explain the role, so the mark scheme gave three alternative paired responses. Candidates that gave an explanation readily gained two marks. Many candidates only gained one mark as they did not give an explanation.

### **Question 3**

**3(a)** The majority of candidates did state a null hypothesis, however, in this case the hypothesis needed to be about correlation rather than difference.

Candidates that had read the whole question could see that they were going to be asked to calculate a correlation coefficient.

**3(b)** Nearly all the candidates presented appropriate graphs.

The units were sometimes missing, a complete y axis label needed include mean percentage etc.

**3(c)(i)-(ii)** Most candidates completed the table correctly worked through the given formula and correctly calculated the value of  $r_s$ .

**3(c)(iii)** Most candidates correctly identified the critical value from the table and compared this with the calculated value of  $r_s$ . The explanations that followed were usually worthy of credit, however it is not sufficient to just say the null hypothesis is accepted. The conclusion must be a complete statement.

**3(d)** Candidates were generally able to describe at least one sensible extension to this investigation and a good number of candidates gained both marks.

### **Question 4**

**4(a)** The context of this question was effect of changing food substrate on the rate of respiration of blowfly larvae.

Candidates were asked to describe preliminary work to ensure a proposed method would collect quantitative data. 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.

**4(b)** Nearly all the candidates described the 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, explaining why soda lime was required. All the marking points were seen regularly and there were a significant number of good answers gaining maximum marks. A labelled diagram was given credit if it provided a marking point.

**4(c)** 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 Rate of respiration was not appropriate as it is a calculated value rather than raw data.

**4(d)** 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 Practical's, 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.

