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Examiners' Report
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Pearson Edexcel International Advanced Subsidiary Level In Biology (WBI13) Paper 01 Practical Skills in Biology I

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Introduction

This is just the second unit three paper on the new specification, which began first teaching about a year ago. As the specimen materials for this paper showed, there have been major changes. The first of these is the loss of question 2, on the issue report. The second change is the increase in the number of marks awarded for this paper, going from 40 to 50. This has been accompanied by a reduction of 10 minutes in the length of the paper. The former is designed to increase the emphasis on the examination of practical work in a science subject. The latter change reflects the fact that candidates no longer have to read nearly 1000 words of text that they have never seen before.

Finally, there have been some changes in the emphasis of which practical skills are examined. The most important of these is the requirement for candidates to devise experimental procedures. These, as on this paper, will always grow out of core or recommended additional practicals, but will involve them having to think about how they will apply their understanding of the techniques used in the core practicals, together with that of the scientific method, to devise a procedure.

The three questions were answered with roughly equal facility, Q2 proving to marginally the least well answered.

Question 1

(a)(i)

This question was answered well by most. The most common errors were to write formulae (such as NO3), the question asked for the ions to be named. Other mistakes included writing nitrogen (not an ion). It should be noted that the paper 3 on the new syllabus will always have a few (about 5) marks for knowledge.

(a)(ii)

Reasonably well answered. The most frequently seen issues were in relation to MP 3, where candidates described a control as distilled water, or described single ion deficient solutions but without naming the ion. There were quite a few who made no effort to say how the DV would be measured but were content to 'get results'. Some talked about qualitative features such as leaf colour. Candidates should be encouraged to realise that a DV should invariably be in the form of a number. Many replicated but often to make results reliable, which is incorrect, or to calculate a mean which is insufficient.

(b)(i)

Quite well answered but units quite often missed. A large number did not attempt to calculate rate at all and gave 155 as the final answer and gained just 1 mark.

(b)(ii)

Not so well answered. Most plotted the SDs satisfactorily but did not get either of the other marks. A proportion failed to achieve mp2 as, although they noted the lack of overlap, they did not realise it indicates the likely significance of this difference. Few gained mp3.

2(a)(i)

The commonest error for step 2 was that it is designed to stain cells rather than chromosomes.
Step 4 was usually well answered. Very few could clearly explain the need for low power followed by high. This may indicate that a microscope has not actually been used.

(a)(ii)

Many were able to suggest the use of gloves or eye protection but did not adequately suggest why such would be used, making statements such as acid is harmful, which is too vague.

(b)

This question was not well answered. Very few suggested that some roots would first be grown at different pH values and the two ideas of replication were rarely seen. This type of question, in which candidates are asked to devise a method based on a well known core practical will be common on this paper.

(c)(i)

This was generally well answered with the only common error being the inclusion of units within the body of the table.

(c)(ii)

Quite well answered, the commonest error being in the reading of the graph to convert MI back into a pH.

(c)(iii)

Generally, not well answered, except by the minority who realised that enzymes would be involved. These candidates were generally able to capitalise on the one mark they got (mp 1) by going on to get 4 and sometimes 5. Mp2 was rarely seen.

3(a)(i)

A significant number were content to write 'zone of inhibition', forgetting that the DV must be measurable.

(a)(ii)

This was a very demanding question and only a very small minority made a mark-worthy suggestion. This was usually for the idea that it was to stop bacterial growth. This was not given if the candidate made it clear they thought it was pathogenic bacteria, and not the experimental ones.

(a)(iii)

A few candidates discussed only diameter. Some distracted themselves by discussing multiple diameters and finding a mean. There was the occasional formula error.

(a)(iv)

A good number suggested the use of solvent or water but very few had he idea of the same type of filter paper disc.

(b)(i)

As always in the past, candidates struggle with percentage calculations. The problem is generally not knowing what to divide by. They were quite good at calculating the correct difference, but then divided by all manner of things to get the wrong answer.

(b)(ii)

This question was very well answered. Errors included the y-axis label lacking 'zone'. There were some line graphs and broken scales, but very few uneven scales. The plot was quite difficult and most candidates managed it well.

(b)(iii)

Most were able to gain some credit here. Mps 1 and 2 were the most commonly seen, but all mps were quoted.

(c)

This was not well answered, suggesting that the limitations of the disc diffusion test are not being considered when the practical is done.

Paper Summary

Based on their performance on this paper, candidates are offered the following advice:

- Make sure you are very familiar with every aspect of each of the 9 core practicals and the 5 recommended practicals, any of these may form the context for questions on this paper.
- For each practical, you should consider the variables involved. The DV, the IV, and the CVs. How is the DV measured? What range of values would be appropriate for the IV? What values would be chosen for the CVs and how would they be determined? These, amongst others, are questions which you may be required to think about in the examination.
- Try to think about how you might design experiments to answer all sorts of questions and get used to this way of thinking. In all experiments, you change a variable, the IV, and look at the effect of these changes on another variable, the IV. All other variables which may affect the DV are kept constant, these are the CVs.

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