Examiners' Report
Principal Examiner's Feedback

January 2022

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

General Comments:

In general, there seemed to be a decrease in experience of practical method. For example, fewer candidates knew the DV this year than in previous seasons.

Comments on Individual Questions:

Question 1

1ai

Lack of understanding of the term dependent variable was the biggest issue.

1aii

A few candidates focused entirely on the idea of safety. Most knew the procedure well and reported it clearly, but there was evidence that some had not seen this practical.

1aiii

Many candidates failed to score because they didn't use the appropriate number of significant figures. These skills can easily be drilled.

It is always worth doing the calculation twice on the calculator to check against mis-keying.

1aiv

Comment as a command word gives difficulty. Some interpret it as describe, others as explain, and in consequence marks are lost.

<u>The definition we use is:</u>

Comment on: Requires the synthesis of a number of factors from data/information to form a judgement. More than two factors need to be synthesised.

However, most candidates managed to see the comparisons between the three substances, and between the impacts on bacteria.

MP3 was often lost amongst overly detailed point-by-point descriptions of the graph.

1b

Here the vast majority got no further than the data; they didn't refer back closely enough to the information given in the question, that these two substances were isolated from the methanol extract, so didn't get into the detailed discussion.

Very few candidates saw the fact that the two chemicals did not give as much effect as the methanol extract alone. Even fewer were able to go on and suggest reasons for this. The idea that these two chemicals are not the only antimicrobial agent found in the whole extract or that, when together, they act synergistically was the sort of thing we were looking for.

Most were clearly not understanding the requirement of a 'discuss' question.

1c

This question was well answered on the whole.

There was a variety of weird and wonderful explanations for both parts of the question – certainly, learning the term 'psychological effect' would save time and anguish and make it less likely that their understanding is lost behind awkward descriptions.

Question 2

2ai

Most candidates did well. Those who did not failed to realise that no conversion was needed once the numbers derived from the graticule had been multiplied by three.

2aii

Not as well-known as it might have been. Xylem and phloem the most common pairing. Sclerenchyma was less well known and a surprising number of candidates incorrectly wrote "parenchyma". Failure to respond carefully to the question led to answers such as *muscle* or *stem and leaves*.

2bi

It was clear that the majority had completed this practical; the minority who had not showed up very clearly.

Some thought needs to go into methods of controlling variables – the experiment would not be possible in the water bath some candidates suggested.

2bii Sone very unwieldy scales were apparent. The most outlandish had multiples of 92 on the vertical axis. There seems to be a desire to fill the whole of the graph paper, rather than choosing scales which are easy to use, in multiples of 5, 10 or 20. Any such scales are unlikely to allow access to full marks as accurate plotting will be impossible.
Getting the straight lines to meet the plotted points was often done carelessly.

2biii Many candidates stated the relationship correctly, *the larger the diameter the less strength*, then restated it the other way round, *the smaller the diameter the greater the tensile strength*, then restated it by saying that *the smallest diameter has the greatest tensile strength.* Restating a mark doesn't gain it a second time.

Nonlinearity was noted by only a few. Even fewer noted changes in gradient.

Question 3

3ai

There were plenty of correct ideas here. However, candidates should not change the whole experiment, for example measuring mass instead of length.

A significant number of candidates do not understand the term *validity*. The most common errors involved repeating the experiment, and vague use of the term *control*. A significant minority of candidates referred to increasing the time taken to carry out the experiment with more readings taken. Some candidates focused on the species of carrot and others on calculating means and standard deviation.

3aii

Candidates will often finish a question about an experiment with the words *and repeat the experiment*. There are two issues with this. They must be clear exactly what is being repeated, that is readings are each value of the IV or more values of the IV, they often are not clear. They, they need to say why repeats are being done, for example the detection of anomalies or for calculation of mean, SD or SE.

3bi

Serial dilution was often quoted, it is not relevant here. There was also lots of confusion between volume in dm^3 and concentration in mol dm^{-3}.

3bii

MP1 seen often, the rest rarely. Much comment on other aspects – disaccharide, glycosidic bonds (so responding only to the word *sucrose* rather than the context), cost. Surprisingly many stated that sucrose is insoluble.

3ci

Many simple errors. This, like the graph question, is amenable to drill and practice, so that candidates have confidence in knowing the conventions, and also take care in checking and re-checking.

All data need to be the same number of decimal places, for example.

3cii

The majority clearly misread the question as *over the first 15 minutes* and so reached a wrong answer.

3ciii

Similar problems here and **3civ**. Failure to be precise, to say the cylinder stopped shrinking/expanding.

There were many good explanations in terms of water potential.

Some final tips:

- Failure to properly read the question is a perennial issue. In this paper, question 1b asked for a discuss of the effects of two chemicals compared with a methanol extract. Hardly any candidates did this, instead discussing the effects of each chemical on the bacteria and not in comparison with methanol extract. This confined them to just one mark at best.

- Make sure you understand what is required from each command word. The meanings are defined in the specification in Appendix 7, pages 68-69.

- Learn about significant figures, decimal places and rounding.

- Prioritise devising a sensible scale (divisible by 2 or 5) over filling the graph paper.

- When describing relationships from a graph look for trends not trying to describe each minor change.