



Examiners' Report Principal Examiner Feedback

October 2022

Pearson Edexcel International Subsidiary /
Advanced Subsidiary In Biology (WBI13) Paper 1
UNIT 3: Practical Skills in Biology I

The general standard was maintained in this series, with most students being able to attempt all questions.

Q1a

Generally well answered, most knew the effect of vitamin C on free radicals and the effect of these on the body. The commonest mistake was to say that vitamin C prevented free radical being produced rather than reducing them.

Q1bi

Some good answers but not many gained full marks. A five-mark question on describing a method requires specific detail at each stage of the procedure. A key point is that the question asks for a method which will allow a comparison. Therefore, details such as using the same mass of food each time or the same volume of water to extract the juice, was often missed out. Some answers failed to make it clear as to how they were carrying out the DCPIP test. Rarely was there a clear description of how the results of tests on foods would lead to the vitamin C content.

Q1bii

Most gained this mark, but a significant number of answers quoted the dependant variable.

Q1ci

Most scored both marks here but some lost a mark due to not quoting to 2 significant figures.

Q1cii

The most common marks awarded were those of orange and lime having more vit C at 20 °C and carrot and pineapple having more vit C at 4 °C. Many also gained the general trend mark. Very few answers made any comment on the lack of standard deviation data.

Q2ai

Many gained this mark for peptide bond.

Q2aii

Many answers were correct here with hydrolysis but some stated condensation.

Q2bi

Most calculated this correctly but those that were incorrect were credited with an 'error carried forward' for the graph

Q2bii

Many full mark graphs were seen. There were some mistakes made on the axis scales and orientation of X and Y.

Q2biii

A change for many with only about a third gaining the mark.

Q2biv

Most answers correctly stated the positive correlation, and some gave a reasonable explanation. However, a significant number did not realise that an explanation was needed. Very few recognised the lack of 'levelling off' and a need to suggest why this did not happen.

If an incorrect graph was drawn credit was still awarded here for correct explanation of that graph.

Q2ci

Most tables gained full marks but If marks were lost it was commonly for incorrect data or units in the cells of the table.

Q2cii

Most answers stated that the stem extract was best and that this was due to higher activity. The second mark was much less commonly seen and the third hardly ever. This is clearly an example of insufficient attention being given to the command word, determine. The definition on the specification is "*The answer must have an element which is quantitative from the stimulus provided or must show how the answer can be reached quantitatively*". The key element that students missed being quantitative. The command word determine should always trigger some manipulation of numbers.

A significant number of answers stated that low enzyme activity was more beneficial illustrating a misreading of the stem of the question.

Q3ai

Many lost marks here for a variety of reasons. Some candidates described the procedure of a root tip squash, answering a question that they wished for rather than the one set.

Those that did answer the question as set lost out on detail, the most common one was that you need an initial measurement if you are going to assess any change over time. It is not good enough to measure length of plant after a stated time if you don't know the initial length.

There were many muddled answers which thought you could cut up the plant and grow each part separately.

Most answers, even if muddled, scored marks for referring to biotic and abiotic variables.

Q3a_{ii}

Many correct answers here. Some answers got as far as correctly working out the value of edible and total plant mass but then failed to use these figures correctly. Some answers illustrated a misreading of the stem and did not use the correct component in their calculation, even though they demonstrated that the correct figures were read off the graph.

Q3a_{iii}

Most answers recognised the general trend, and many quoted the correct relationship between edible plant material and solution concentration. Few correctly described the difference in mass of shoots or roots in different concentrations.

Many stated that the shoot had the highest mass but that did not answer the question with reference to the investigation, which was the effect of changing the concentration of solution.

Credit was given for a correct description of an incorrectly calculated answer in 3a_{ii}.

Q3a_{iv}

Surprisingly this was not answered as well as in previous years. However, there was still evidence that many candidates understood the need for data on variation and the consequence of overlapping standard deviations in judging significance.

Q3b

This question required a recognition that phosphate was present in the solution as potassium hydrogen phosphate and so this had to be left out of the solution. This would also remove potassium but, as this was present in potassium nitrate, it could be compensated for by adding extra of this salt. The first point was made by many, but few answers addressed the second point.

Q3c

This question produced a few excellent answers. Most saw that the highest uptake was in the pH range 6.5 to 8, fewer noted that outside this there was deficiencies in phosphate and nitrate. There were references to denaturation of enzymes outside the optimum range.

The commonest loss of marks was in the case where the answer only referred to the width of the bars instead of how this related to the uptake of the ions.

General comments

- Reading the question carefully and giving a bit more time to interpreting what is being asked would improve candidates' answers. Also giving more detail in questions about describing methods.
- Calculations need to be laid out clearly so that credit can be given for working, even if the final answer is incorrect.
- 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.
- It is important to remember that the DV has to be measured in some way, it needs to be quantitative. It might be a measurement on a suitable piece of equipment or maybe a count may be an appropriate measurement.
- Try to think about how you might design experiments 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 DV. All other variables which may affect the DV are kept constant, these are the CVs.
- Make sure you understand what is required from each command word. For example, explain may involve some description, but what has been described must then be accounted for. Determine needs some quantitative element. Comment on needs a synthesis of factors to make a judgement.