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Introduction

The paper followed the general pattern seen over the previous series. Candidates showed facility to the level of attempting answers to all the questions. There seemed to be no issues with timing, despite the fact that the paper carries more marks than the legacy specification.

Question 1a Most candidates were able to suggest that the mass is due to water intake and that this takes place by osmosis. Fewer candidates were able to give the correct reason for the second mark point. There was a lack of clarity in many answers as to what concentration gradient they were referring to.

A good number of candidates thought that it is the salt solution that is moving.

Question 1bi Most were able to gain 3 or 4 marks for this core practical. The mark most commonly missed was how to calculate the percentage change.

Question 1bii and 1biii Although the majority of candidates were able to draw the graph neatly and correctly, very few understood how to then use this to correctly to answer biii.

Question 1c Candidates struggled with this question. There was a tendency to make a sweeping statement about the shape of the graph saying simply that water potential decreased over time. Candidates often treated any fluctuation in the line, no matter how small, as if it is the same as a large drop or spike. Many candidates simply described the line and didn't try to explain the decrease.

Question 2ai Surprisingly fewer than half were able to gain both marks here. The presence of a glycosidic bond was better known than that glucose and fructose from the sucrose molecule.

Question 2aii The majority of candidates were able to gain 1 mark here.

Question 2aiii A majority of candidates gained one mark, but very few were able to gain both. The key here was to appreciate that there were 2 marks and that the question had 2 parts, why a set temperature and why was that 25°C?

Question 2aiv and v The majority of candidates were unable to identify a correct variable, and most of those who did had no idea how to control it. Incorrect variables (such as humidity or volume) were considered for marks in v as error carried forward.

Question 2avi A reasonable number of candidates understood that sucrose would become limiting. But the second mark point was rarely seen. In some, there

was confusion about what exactly was being compared, with some suggesting that it was the initial and final rates.

Question 2avii Responses to this question suggested that candidates were struggling with the idea of the initial rate, despite it being a core practical (CP, no. 4). Most did not understand why it's important and didn't know how to find it. Many understood that they could use Benedict's solution, but not that they needed to take repeated readings each time. When it was suggested that a graph should be drawn it was often of the wrong thing, with lots wanting to put pH on one axis.

Question 2bi This question was well answered, although not by all candidates. The main reason for loss of marks was for putting the units, %, in each cell.

Question 2bii A good number of candidates gained the first marking point. However, although many had some idea of what is going on, they were frequently too imprecise in the way they expressed it to gain a mark. For example, instead of talking about smaller intervals candidates discussed a narrower range.

Question 2c Candidates generally did reasonably well here and were able to gain some marks, usually mp 1 and 3. Many candidates compared the activity of the two enzymes, rather than the effect of temperature on each of them.

Question 3ai This question was well answered by most, although a surprising minority did understand what to do, a good few drawing in the box on the photograph. Another group drew a diagram of something, often cells, and fully labelled it, which is not what was asked for.

Question 3aii Many candidates made what should have been an easy question into a difficult one and it was clear that they didn't know how to do it and so guessed.

Question 3bi, 3bii and 3biii Candidates generally handled the graph well and understood that the SDs didn't overlap, indicating significance of the difference. However, only a handful backed this up with figures.

Question 3biv This calculation was accessible to most.

Paper Summary

- As ever, 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.
- Attention to detail is vital in A Level science. For example, on this paper, it was clear that many students were not at all familiar with the concept of initial rate of enzyme-catalysed reactions. This specified in core practical 4 and needs to be covered.
- 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.

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