



Examiners' Report Principal Examiner Feedback

October 2022

Pearson Edexcel International Advanced Level
In Biology (WBI11) Paper 01: Molecules, Diet,
Transport and Health

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Introduction

We saw a wide range of responses from candidates, with some really excellent responses from the more able candidates. The MCQs generated a range of responses as did the calculations. The two levels-based questions did generate some level 3 responses, but candidates still need schooling on how to structure their responses to access all six marks.

A vast number of centres are using our mark schemes and examiners reports to prepare their candidates; this is evident in the answers where mark points have appeared on previous mark schemes.

Question 1

Candidates were asked a virtually identical question in the summer and there were more correct diagrams seen on this paper, presumably because centres had used the summer paper to prepare their candidates.

As seen in the summer the commonest errors were to include three fatty acids in the diagram, attaching the fatty acids to the phosphate head or not showing covalent bonds connecting the components.

The three MCQs were very straightforward and did not really cause the candidates any issues.

Question 2

The MCQ in the first part of this question was also very straightforward, causing very few candidates a problem. However, (b) part (i) saw a surprisingly high number of incorrect responses. The commonest errors were to misspell diastole so that it read 'diasystole' which we could not accept or to refer to the stage as ventricular diastole, which we also felt was not acceptable.

The first calculation was reasonably straightforward, and many candidates scored both marks. The commonest error was to get the division the wrong way round, dividing 73 by 60, but candidates were still able to score an 'error carried forward' mark if they completed the rest of the calculation correctly.

The mark for the second calculation was lost by candidates who incorrectly rounded up their answers to the wrong value or to too many decimal places. If we do not ask candidates to express their answer to a specified number of decimal places or significant figures, then they are expected to select an appropriate number themselves (maths references A.0.2 and A.1.1).

In the last part to this question several candidates did not recognise that B to D was at the atrioventricular septum so instead of writing about the importance of the delay, we saw many responses about blood pressure and not damaging the heart tissue.

Question 3

In part (a) many candidates realised that they had to link the structure of the capillary to its function. However, centres are either not teaching their candidates about the formation of tissue fluid or candidates have misconceptions from their GCSEs as many responses referred to the diffusion of molecules, such as glucose, out through the capillary pores. We could accept diffusion if gases were specified.

A range of diagrams were seen in part (b) with a high proportion scoring all three marks. Marks were lost by candidates who drew careless diagrams and had label lines that did not actually touch the structure labelled. Candidates need to be taught that drawing diagrams are not an easy source of marks as they must be drawn carefully so that they are representing accurately the actual structure and labelled appropriately.

Part (c) caused few problems; most candidates knew what the role of vein valves are. Some candidates did incorrectly name the valves, confusing them with the semi-lunar valves or the atrioventricular valves.

Part (d) was another question where careless drawing cost marks. In the first and last section of the graph, some candidates drew free-hand lines which slightly increased. Some candidates did not use the two vertical lines to ensure that the gradient of the line was changing at the right place.

Question 4

The question asked in part (a) was like one asked in the summer and the responses this series were much improved, again indicating that centres are using past papers to prepare their candidates. Mixed responses were seen for the MCQ with many candidates selecting the correct response.

Part (c) also saw a range of responses. Most candidates appreciated what they were being asked. Marks were lost by those who did not make it clear that the substrate binds to the active site and by those who did not answer the question asked; we wanted to know why E_1 could not catalyse the conversion of **both AB and AC** into their respective products.

Part (d) was less well answered. Many candidates described the results, the effect of temperature and pH on rate of reaction. Conclusions should relate to the variables i.e. the temperature and the pH. Many candidates referred to a temperature of 30°C and a pH of 4 being the optimum values; this conclusion cannot be made from this data.

Question 5

We saw many variants of 'Ficks' in part (a) and were fairly generous with the spelling and pronunciation. The commonest wrong answers were Bohr and Boyles.

The MCQ in part (b) saw a whole range of responses with only the more able candidates being able to work their way through the effect that a change in all three parameters would have on the rate of diffusion.

Part (c) was extremely well-answered.

Part (d) was the first of our two levels-based questions. The structure of candidates' responses has vastly improved, with the majority writing about all three components of the question: the structure of the salamander, its behaviour, and the graph. However, the least-able candidates barely did more than repeat the information that we had given them in the question. The graph caused many candidates issues. Some candidates wrongly identified the two lines so muddled up the frequency data with the pO₂ data. Poor expression resulted in confusion between the percentage saturation of the water with the partial pressure of the blood. However, the commonest error was to describe the saturation of water as causing the changes in the rocking frequency instead of realising that the salamander modified its behaviour according to the oxygen availability.

Only the more-able candidates could describe the graph accurately, picking out why the rocking frequency decreased at higher saturation of water.

Question 6

Candidates tend to know the blood clotting story so the MCQ at the start of the question scored well.

Many candidates could identify a safe range for the INR level and were not phased by the fact that they had never heard of this parameter. However, many responses saw insufficient explanation for selecting the specified range. A small proportion of candidates gave their safe range as being between two ranges.

Responses to part (c) were probably the most surprising. We have asked questions relating to blood clots or atheromas and CVD on numerous occasions in the past. We have always insisted on the blood vessel being named as the coronary artery and we have always wanted the heart tissue or cells being deprived of oxygen. Very few candidates gave this detail in their responses and therefore only scored the first mark point.

The calculation in part (d) was not particularly well done. Percentage calculations always seem to cause candidates problems but the answer to this one had to be given to a whole number.

Candidates made good attempts at the second part of (d) and all our mark points were seen frequently. However, full marks were rarely scored as many candidates did not write enough points to be awarded four marks. This is a typical example of where candidates need to be constantly reminded to use the mark allocation to guide them on how much to write.

Question 7

Mixed responses were seen to the MCQ at the start of this question, but a number of candidates identified the correct answer.

The two calculations in (b) caused a lot of problems. In (i) many candidates did not do the subtraction before calculating their percentage and in (ii) many candidates could not express their answer as a ratio. We have noticed in previous series that many candidates cannot correctly express values as a ratio.

Part (c) produced a mixed response. Some candidates mis-interpreted the question and wrote about the formation of disulfide bridges. Others wrote about enzymes and hydrolysis but did not link their answer into the question so did not score our second mark point. 'Use the information in the diagram to support your answer' is a big hint that the answer must be related specifically to the context of the question.

Part (d) was our compare and contrast question, and candidates are clearly being drilled on how to structure their answer to access the marks. In this particular question the candidates found it easier to identify the differences than to identify the similarities. Some candidates wrote about the properties of the two molecules instead of their structures.

Part (e) was the second of our levels-based questions. Disappointingly, there were several candidates who simply described the data or offered little explanation that did more than repeat the information that we had given them in the stem of the question. Very few candidates commented on the effect of cinnamon in comparison to the effect of the insulin.

Question 8

Candidates do well on questions about the structure of DNA and we saw some good descriptions of the base pairing and the number of hydrogen bonds involved. However, few candidates appeared to understand the significance of a purine binding with a pyrimidine to produce a parallel molecule.

The calculations in this question also caused problems. Many candidates cannot express a value in correct standard form and others cannot cope with values involving lots of zeros.

Part (c) saw a range of responses. Unfortunately, as in earlier questions, marks were lost due to inaccurate drawings. The depth of the bars either had to be the same as the one we drew or else half the size, depending on the question, but we saw all sorts of shapes and sizes. We did not expect a candidate to get a rule out and measure their bars, but we did expect our examiners to be able to identify which was which.

Summary

A few suggestions for improving candidate performance are given below:

- Candidates should avoid repeating information in the stem of the question in their answers as this will not gain marks.
- Candidates need to take notice of the mark allocation for each item to help them decide if they have written enough points to be awarded that many marks.
- Candidates should consider the questions asked in the early question parts as they are quite often trying to give a clue as to what is expected in the latter question parts.
- Candidates should check the command word for each question before attempting their response. If the command word is 'explain', then they need to make sure that some science has been used some science to say why something has happened. Their answer should include terms like because, therefore, as a result, so. Appendix 7 in the specification lists all the command words and their meanings.
- Any information given in a question is there for a reason, albeit in a table, a graph, a diagram or in the text of the question, so must be used in the response.
- Maths skills as outlined in the appendix should be practiced and in particular candidates need to be able to convert one unit into another, write a ratio in the form $x : 1$, express a value in correct standard form (only one digit to the right of the decimal point), round up values to a given number of decimal places or significant figures and work out percentages.
- Diagrams should be drawn carefully to be an accurate representation and labelled carefully.

