Examiners' Report
Principal Examiner Feedback

October 2024

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

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 a few level 3 responses but disappointingly not that many; candidates still need schooling on how to structure their responses to access all six marks. It was evident that 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 and the improvement in the responses to the compare and contrast question. Some candidate's responses would have benefited from more of this type of training, however.

Question 1

Many candidates could identify the property of cell membranes that enables a cell to change shape in part (a). The commonest error was to write 'fluid mosaic model'; we did not really feel that this was identifying the specific property relating to changing shape.

A range of responses were seen to the two MCQs in part (b).

The last part of question 1 also saw a range of responses. The most frequently awarded mark point was probably the second one, usually for 'the amoeba is small'. Mark point 3 was seen in a reasonable number of responses but those candidates who talked about the concentration gradient rarely stated where the gradient was between so did not get awarded the first mark point.

Question 2

The calculation in part (a) was well done and candidates have clearly been schooled in expressing answers in standard form as the improvement was obvious.

The MCQ in this question was generally scoring.

The first part of (c) was not high scoring as many candidates described the changes in the levels of subunits throughout the weeks and not overall in each of the three stages of development. We felt that there were two valid approaches that could be taken, either stage by stage or subunit by subunit, hence the two alternative mark schemes.

Many candidates understood that fetal haemoglobin needed a higher affinity for oxygen than the adult haemoglobin, but few could explain why this was necessary. Many candidates stated that this was necessary because of the low partial pressures, not appreciating that it was necessary for the dissociation of oxygen from the adult haemoglobin and the binding to the fetal haemoglobin because the partial pressures in the two blood systems are essentially the same.

Question 3

The three MCQs in part (a) of this question were reasonably well done; candidates are very familiar with genetic questions and the terminology used in them. The third MCQ was probably the least well done of the three, as some candidates did not take into account the fact that the question asked for a female (with CMT).

The calculation in (b)(i) was answered correctly by a high proportion of candidates with the majority of these giving their answer in standard notation.

Asking candidates to apply their knowledge to a condition that shows a dominant pattern of inheritance was a new approach and did not appear to throw many candidates. There were a proportion of candidates who did not use the genotype we had given them for parent 2 but these candidates could still access the second and third marking point. Disappointingly, a large proportion did not gain the third mark as they did not indicate which genotype would correspond to which phenotype; something that has been commented on many times in examiner's reports.

In the final part of question 3, the majority of candidates were awarded the second mark point but failed to be awarded the first mark point due to poor expression; something else that we have commented on previously in examiner's reports. Candidates, in this case, needed to refer to the CMT allele or mutation being located on the X chromosome; we cannot accept the CMT gene or CMT or the disorder being located on the X chromosome.

Question 4

A number of candidates could convert the units correctly and round up their answer appropriately, selecting the correct answer for the MCQ in part (a) of this question.

Good answers for the description of the thick aorta wall and its significance were seen, with many candidates being able to name at least one molecule present in the wall. Many candidates described the capillary wall as being thin, which is implied in the stem of the question; we needed more detail. Few candidates appeared to understand the role of the capillaries in leaking plasma to form tissue fluid, but some wrote about their role in gas exchange in the lungs.

Part (b) to this question usually only scored 1 mark; very few candidates knew that when the command word is 'determine' they need to include a calculation in their response to access full marks.

A range of responses were seen to part (c). A mark was lost by candidates who did not specify if they were talking about the flow of blood in a forward direction or backward direction in their description of the rate changes.

Question 5

There were some good responses to part (a), with many candidates appreciating that they had to write something about a safe dose and something about an effective dose to access both marks. There was some confusion with the other types of drugs listed in the spec.

We have asked about the role of mRNA in a number of series now, but candidates still do not appreciate that the mRNA is acting as a copy of the gene (a noun) and is not copying the gene (a verb). A number of candidates also referred to a copy of the DNA, which is not biologically accurate enough as it is only a copy to a relatively small part of the molecule – the gene. The second mark point was awarded frequently.

The first of the two levels-based questions on this paper took a slightly different approach to previous series; candidates had to synthesise information in a written format as opposed to data in a table or a graph. It was evident that most candidates did this successfully but unfortunately the use of the word gene when they should have been writing about alleles limited responses to a level 1. Surprisingly few candidates picked up the instruction to write about the blood clotting process and genetic screening, despite this being written directly above the answer lines. As these were required to access the level three marks, candidates who did use the term allele correctly did not score the top marks. Those who did write about the clotting process produced clear accurate accounts. Those who wrote about genetic screening tended to focus on prenatal screening which was not relevant to the context of this question.

Question 6

How cholesterol increases the risk of heart disease (part a) has been asked on numerous occasions previous series and the same comments appear in the examiner's report. This is no exception. Candidates score the mark about the formation of plaque, provided they do not call it a fatty deposit. However, they tend not to specify that this forms in the coronary artery, if the question is about heart disease. They tend not to refer to the blood flow to the heart **cells** or **muscle** being prevented and they tend not to finish the story off by describing the consequence of this: no oxygen for respiration by the heart **cells** or **muscle**.

In part (b) we wanted to know how the primary structure of two proteins could vary. We rarely ask this, but candidates responded well.

The questions in part (c) were set in an unfamiliar context but candidates generally answered them well. In response to part (i) most candidates told us that the investigation was mimicking what happens in the body and the more able candidates used the mark allocation to extend their response. Part (ii) did not cause many problems, nor di part (iii) where candidates were back in the more familiar territory of factors affecting enzyme reactions.

Some candidates still have not grasped the difference between the command words 'describe' and 'explain'; this was very evident in this question where a large proportion of responses simply described the data, thus scoring only one mark.

Question 7

Unfortunately, in the first part of (a), candidates did not appreciate that we wanted to know the effect of the mutations on the DNA **sequence** and not a definition of each of the types of mutation. It is worth noting here, that even if we had wanted a definition of each of the types of mutation we would not have accepted substitution / insertion / deletion of bases as this goes no further than repeating the name of the mutation.

There were some good responses to the second part of (a) with candidates describing the effects of the different types of mutation, often scoring three marks. However few candidates scored full marks as they did not finish answering the question by explaining how protein **function** would be affected, as this is what would affect the survival of the animal.

The last part to (a) scored very well.

The lines drawn in (b)(i) really highlighted the fact that candidates have not been taught how to draw a line of best fit through data of this sort. The line should only be drawn through the data available and not extrapolated either side of it; several candidates extrapolated their line down to the bottom lefthand corner of the graph. There were a few candidates who did not draw a line of best fit, even though there were clear instructions in the question to do so.

Candidates tend to struggle with describing conclusions that can be made from data and the second part of (b) was no exception. It needs to be emphasised that conclusions generally describe trends or overall patterns and rarely include comments about individual data points.

There were some good ideas suggested as to why the number of mutations per cell might differ in the different species in response to (b) part (iii).

Question 8

Candidates found themselves back on familiar territory in part (a) of this question and there were some very high scoring responses. The majority of candidates have mastered the command word 'compare and contrast'; very few descriptions of each type of fatty acid were seen. There was the expected confusion between the two types of fatty acids in the responses from the less able candidates and there are still a few candidates stating that saturated fatty acids have no double bonds, when they should be specifying no carbon-carbon double bonds.

The MCQ in the first part of (b) only scored poorly for those candidates who cannot remember which way round to express their ratio, but these seemed fewer than in previous series.

There were some excellent ideas for questions that should be included in the questionnaire for the second of our levels-based question but unfortunately many did not score that highly as they included predominantly non diet-based questions. This did not count against the candidates but tended to mean that they did not suggest enough diet-based questions to access the higher levels. Some of the weaker candidates simply gave a reason for their question as 'because this increases the risk of CVD'; this is too vague a reason as the spec requires specific details on this topic and candidates should be encouraged to include AS level detail in their answers.

The responses to part (d) were disappointing. Many candidates wrote perfectly reasonable comments but failed to specify if this made the investigation more valid or less valid. Unfortunately, we could not assume which they meant. What was encouraging was that many candidates were using the mark allocation for the question and came up with four comments.

Summary

The following advise is offered to centres and candidates preparing for future series:

- Past mark schemes to AO1 questions should be used as a summary of the main points that we expect candidates to know about a topic. This would have helped in 6 part (a) for example.
- When candidates are explaining something, they should remember to include AS level detail in their responses. This would have helped in 8 part (b)(ii) for example.
- Candidates should learn the expectations of the command words that we can use. The difference between describe and explain is one example and cost marks in 6(d). A mark was also lost in 4(b) as many candidates did not appreciate that they had to do a calculation to score full marks when the command word is 'determine'.
- Candidates need to be taught the maths skills specified in the appendix at the back of the spec, as 10 % of the marks on any one paper will be for maths skills. Being able to draw an appropriate line of best fit would have gained many candidates an extra mark in 7(b)(i) and knowing which way round to express a ration would have helped some candidates in 8(b)(i).
- Time should be spent teaching candidates to read the question through carefully, identifying the specific requirements of the question. This would have helped in 5(b)(ii) and 8 (b)(ii) for example.