Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

January 2025

Pearson Edexcel International Advanced Level In Biology (WBI14)
Paper 01 Energy, Environment, Microbiology, and Immunity

Introduction

This paper saw the expected range of responses made by candidates, but what was very noticeable was how few responses were left blank, particularly when compared to the October paper last year. It was clear that many centres have used our mark schemes and examiners comments to train their candidates into how to answer our questions.

Question 1

The three MCQs and the calculation in this question did not cause candidates to many problems.

However, providing an accurate definition of the term 'ecosystem' did not prove so straightforward. It was imperative that candidates included the idea of an interaction existing between the organisms and (an interaction with) their environment. This interaction is a key idea and had to be included to be awarded the mark; this is consistent with previous series when we have asked for this definition.

Question 2

Question 2 started off with a very straightforward definition which scored very well.

A range of responses were seen for part (b). Candidates who focussed on the two aspects to the question, body temperature and muscle contraction, scored well. Some candidates had clearly seen the question and graph in October's paper last year and produced a response that answered that question and not this question.

Question 3

This part of the specification has not been tested using a predator-prey relationship graph and it was encouraging to see the excellent attempts by many candidates to answer this question. Very few blank responses were seen.

The calculation at the start of the question was answered correctly by the majority of candidates.

Candidates who drew their line on the graph carefully with a bit of thought scored both marks. A careless approach, possibly because the questions seemed easy, cost candidate's marks if they did not think about the height of the peaks or the displacement needed for the position of the curve.

Candidates could describe the changes shown in the graph and could explain that they were due to food availability but again, those candidates who thought this was a straightforward question and did not think it through carefully enough lost marks. We definitely wanted to know that the numbers were increasing due to breeding and numbers were decreasing due to starvation in the case of the lynx and increased predation of the hares.

Excellent suggestions were made in part (b).

Question 4

The two MCQs were generally answered correctly.

The calculation in part (a)(iii) saw a range of calculated values. There were several places where candidates could trip up but there were consequential error marks available. Carelessness lost some candidates a mark if they did not position their rule accurately across the widest part of the diagram to get the diameter. Errors were made in converting mm or cm into µm. A few candidates multiplied by 16 000 instead of dividing by it. Some candidates used the diameter in their calculation and not the radius and others did not express their answer as a whole number as directed.

Candidates clearly knew why thylakoids had a large surface area. Marks were lost by candidates who did not write comparative responses or referred to photosynthesis being faster without pinpointing its significance at the level expected.

Each part of part (b) scored well. The MCQ did not cause too many problems, candidates could select values from the diagram to show the ration of ATP: reduced NADP and understood that some of the GALP produced was needed to regenerate RuBP for continuation of the Calvin Cycle.

Question 5

Part (a) generated all sorts of responses and unfortunately a fair proportion of candidates either read the diagram upside down or else explained it in terms of succession and competition between the pollen grains themselves. The more able candidates who did interpret the diagram correctly tended to pick up the second and third mark points but did not link the appearance of the cereal crops in the first place with the start of farming.

The MCQ at the start of part (b) was straightforward for most candidates.

A range of responses were seen in part (ii) with several responses scoring 4 or 5 marks. Common errors included: not using the terms ‘decomposition’ or ‘decay’ for mark point one but using ‘preserved' copied from the stem, confusing the source of the enzymes for mark point two i.e. human or microbial, stating that the enzymes would be denatured for mark point two and not linking the anaerobic conditions with the waterlogging for mark point four.

Question 6

Part (a) caused few problems as many candidates had learnt the textbook definition of the term antibiotic.

The MCQ was answered quite well.

Part (c) was broadly similar to a question in October and candidates wrote about the need to develop new drugs which the bacteria were not resistant to. A few responses went into details of antibiotics acting as selection pressures which was not relevant to this particular question.

A range of responses was seen to part (d), with most candidates understanding what the question was after.

Candidates generally find writing conclusions quite difficult, but the data in part (e) was slightly more straightforward than some they have been presented with in other series. Both the first and second mark point were seen quite frequently but rarely together. Lots of candidates attempted to say what was the essence of our last mark point by stating that antibiotic C was the most effective but omitting to say at what.

Responses to part (ii) were good with many candidates realising that the new drug would mean lower doses of antibiotic C would be needed and then used their knowledge of the role of gut flora to go on and explain the advantage of this.

Question 7

The appropriateness of responses to part (a) depended partly on whether or not the candidate had read the question carefully and named a source that was anthropogenic. The other common error was to name something without saying under what circumstances the gas was released e.g. stating 'fossil fuel' without saying that it needed to be burnt.

We have not asked how greenhouse gases cause global warming (part (b)) for a while now but there were still some very accurate responses. Common errors included not stating where the gases accumulated, muddling up short wave radiation with long wave radiation and not stating what increased in temperature.

Candidates used the graph in part (c) appropriately to make predictions but many then did not consider how many decimal places their answer could be reasonably expressed in.

The correct answer to the calculation in (d)(i) was common.

A range of responses were seen to part (ii) with very few blanks which was encouraging given the unusual data that the candidates were supplied with. A common error was to just describe the data we had supplied but those who realised what they had to write in response to this question generally scored a couple of marks; usually the first two.

We had expected the first part of (e) to be straightforward, but this was frequently not the case. Some candidates over-complicated it and described the use of calibration curves to work out the actual numbers of bacteria and then use these values to calculate the growth rate constants which could then be compared. This would not work of course. Many wrote about the higher turbidity being used but did not explain that it would be the difference in turbidity between the start and finish times that would have to be compared. Some candidates did not even mention the need for a comparison.

Part (ii) scored well with the majority of candidates suggesting what was our first idea on the mark scheme.

A common error in part (iii) was probably due to not reading the question properly. A high number of responses were about the methanotrophs using the nitrous oxide and carbon dioxide, not producing it. A reasonable proportion realised that production of these gases may outweigh the advantages of the bacteria using the methane but did not go on to state that it was the net difference that was significant.

Question 8

The data supplied in part (a) for conclusions to be made from was also straightforward. Candidates did need to appreciate that they had to make a conclusion about age and a conclusion about sex to access both marks, however.

Candidates clearly understand what a placebo is. However, part (b)(i) did have a mark allocation of two, so we were expecting two aspects to be described. The first and third mark points that were almost exclusively awarded.

Part (ii) of (b) saw a mixture of responses but there were rather a lot of candidates who simply wrote that the differences were the largest without realising that these differences would have to be significant differences for that conclusion to be made.

Good responses were seen to part (iii) although some candidates talked about antigens on the bacteria and not the toxins which did not match the context of the question.

Compare and contrast has become a well-recognised command word and candidates know how to answer these questions now. We saw many responses where the differences and similarities were each written in a pair and responses that included at least one similarity and one difference. A common error was to give the converse of one difference as a stand-alone difference which we obviously could not credit.

Generally speaking, candidates find describing limitations quite difficult. However, most coped well with the limitations of the data we had given them in the previous part of the question. The first two-mark points were the most frequently awarded.

Question 9

The levels-based question saw some excellent explanations of how retroviral genetic information becomes incorporated into the human genome, which immediately allowed them to access the level two marks. Many candidates also knew that the ERVs needed to be in the gametes in order to be passed onto the next generation but only the more able candidates thought about how this DNA would get into the gametes and end up in all cells of the offspring, which was required for a level three mark.

Part (b) was reasonably well-answered, and we saw some excellent explanations by some candidates. It was clear that some centres have taught their candidates a variety of examples of genetic modification but had not made it clear tot heir candidates if these switched on or silenced the gene. The topic 3 specification requires candidates to know about DNA

methylation and histone modification, and post-transcriptional changes which were not relevant to this question.

The final question on the paper saw a range of responses and the scores depended on how well centres had schooled their candidates into the wording and detail expected in an immunology response. The slight caveat in this question was that the candidates had to write about a secondary immune response to the appearance of cancer, which few did, capping the mark to four.

Summary:

As commented on earlier, some centres are clearly using our mark schemes and examiner's comments to prepare their candidates. However, there are still some points that need emphasising:

- care should be taken when drawing graphs, taking measurements and answering questions that seem very straightforward or obvious.
- candidates need to remember that this is an A level paper and therefore answers should include A level terminology and A level of detail
- candidates should use previous mark schemes to produce a glossary of terms used in the specification
- candidates need to be taught how to select the number of decimal places or significant figures their answer should be expressed in
- candidates should always use the mark allocation as a guide to how many points you need to include in your response
- when describing differences between two things, candidates should make sure that one of the descriptions is not a description of the converse.