Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

January 2019

Pearson Edexcel International Advanced Level In Biology (WBI04) The Natural Environment and Species Survival

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Introduction:

This paper saw a wide range of responses with many candidates demonstrating a good knowledge and understanding of the topics tested. We were pleased to see fewer blank responses than we saw in this paper last year.

Question 1

Part (a) Candidates clearly have a good knowledge of the structure of HIV and know that its host cell in the T helper cell.

Part (b) Candidates were able to explain why viruses could be used as vectors and understood why different viruses needed to be used. However quite a few candidates did not use the mark allocations for the questions and therefore did not make sufficient points to gain full marks.

Question 2

Part (a) Candidates demonstrated a good knowledge of the structure of the membrane but some account were too vague as it was not clear exactly where the cholesterol and glycoproteins were positioned in the membrane.
Some very good responses were seen explaining the importance of the macrophage cell membrane in both the non-specific response and the immune response. Although candidates knew about the role of opsonisation, few appreciated that there must be receptors for antibodies on the macrophage membrane.

Part (b) The less-able candidates could describe the roles of the Golgi apparatus and lysosomes but only the more-able candidates answered the question in the context of the macrophages. There was also some confusion between lysosomes and lysozymes, not unexpectedly.

Question 3

Part (a) A mixture of responses was seen for this question. Some candidates had read the information given to them and identified the domain as Eukarya but others identified a fungus as a microorganism and named the domain as one of the others.

Part (b) This trio of MCQs elicited the range of responses that we had anticipated. Most candidates knew that the cell membrane would be found in both types of organisms but were less confident in where chloroplasts and ribosomes would be found.
Part (c) This MCQ saw a range of responses, again not unexpectedly.
Part (d) Candidates clearly knew that antibiotics affected bacteria and not viruses. The more-able candidates used the information given them to explain why antibiotics may not affect fungi. Part (ii) caused few problems with many candidates scoring all three marks. Our first mark point was rarely seen as candidates still struggle with giving their responses in the context of the question, which is something that they are really going to have to learn to do

on the new spec. We also saw quite a few responses where the bacteria were described as being spread onto the petri dish, instead of agar.

Question 4

Parts (a) and (b)
Neither of these MCQs caused too much problem although there were a few candidates who thought that enzymes increase activation energy.

Part (c) These spec terms have not really been thoroughly tested in previous papers and we saw a range of responses and some clear confusion between the actual meanings of each of the terms. The least-able candidates defined the terms using the actual terms in their definitions, scoring zero. Only the most-able candidates were able to define the term and give an example using the chicken, scoring both marks. Very few blanks were seen for this question which was very encouraging.

Part (d) Candidates were able to write quite a lot about both dendrochronology and pollen in peat bogs, scoring one mark for each. Only the more-able candidates were able to actually explain why these can be used as evidence for global warming.

Question 5

Part (a) This part of the question was intended to be challenging but did cause more problems than expected.
Surprisingly few candidates could describe the role of the template strand in transcription; many responses omitted to mention that it contained the (genetic) information or code.

In part (ii), we saw responses that demonstrated good knowledge of post-transcriptional modification, however they bore no resemblance to the context of the question. The only marks that we really awarded for this question were the first one for defining the term mutation and the last one for recognising that the structure of the haemoglobin would be different. This will be a useful question for teaching future candidates to read the question carefully before launching into their response and to ensure that the context of the question is being addressed.

Part (iii) also saw a range of responses with the most frequently awarded mark being the last one. A surprisingly high number of candidates did not appreciate that the stop codon was transcribed onto the mRNA.

Part (b)
This question will also be valuable in preparing future candidates as the context of this question was ignored as well with only the more-able candidates realising that they had to write about protein and not DNA.

Question 6

Part (a) A wide range of chloroplast diagrams were seen ranging from extremely accurate drawings with every structure labelled down to the unrecognisable. The commonest errors, made by the least-able were candidates, were to draw nuclei and mitochondria inside the chloroplast and to label the two membranes as the cell wall and cell membrane.

Part (b) The more-able candidates made an excellent attempt at describing the roles of the chloroplast membranes, scoring three or four marks. The less-able simply wrote everything that they knew about photosynthesis. We are still seeing a lot of responses that refer to the 'trapping' or 'catching' of light, when really the only acceptable expression is 'absorbing' light.

Part (c) It was clear that several candidates had sat our October paper as a mock in preparation for this series. Unfortunately, this question was very slightly different, so writing the October answer *verbatim* did not score all the marks in Part (i) Candidates did not look carefully enough at the graph and even the more-able candidates scored poorly in part (ii). Responses in part (iii) were too vague in many scripts so not as many candidates scored what should have been a relatively easy mark.

Question 7

Part (a) Candidates were not phased by the slightly unusual visual used in this question. The vast majority calculated the answer correctly.

Part (b) Calculating percentages always causes candidates problems and this calculation in part (i) was no exception.

In part (ii) candidates recognised that the oceans covered a far greater area than the estuaries, scoring mark point 1. Far fewer candidates scored the second mark.
Most candidates understood what was being asked of them in part (iii). Marks were lost by candidates who did not appreciate that only plants contribute to NPP and by those candidates who were not specific enough in their answers for mark points 3 and 5.

Part (iv) caused very few candidates a problem; they understand, or at least can recall, the relationship between NPP, GPP and R.

Question 8

Part (a) Responses were disappointing to this question. Very few candidates could relate the virus exiting the host cell to the tissue damage caused.

Part (b)The MCQ was well-answered.

Part (ii) was less well-answered, with only the more-able candidates identifying the period of time correctly.
There were some good responses to part (iii) with many candidates knowing the sequence of events leading to the production of memory cells. Candidates were less clear about the significance of the memory cells however. Common errors included vaccines containing dead viruses, antibodies destroying viruses (directly) and the memory B cells producing the antibodies.

In part (iv), we saw a number of candidates recognising that the maternal antibodies would bind to the FPV antigen enhancing phagocytosis by macrophages. Candidates do not seem to appreciate that antigens bind to B cells.

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