Pearson
Edexcel

Examiners' Report
Principal Examiner Feedback

October 2019

Pearson Edexcel International Advanced Level
In Biology (WBI04)
Paper 01 The Natural Environment and Species Survival

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Grade Boundaries

Grade boundaries for all papers can be found on the website at:
https://qualifications.pearson.com/en/support/support-topics/results-certification/grade-boundaries.html

October 2019
Publications Code WBI04_01_1910_ER

Introduction

This paper was one of the last exam papers for the old specification and it was clear that some candidates had been well-prepared for this exam, by their centres, using past papers.

Some of the specification points that have been assessed frequently in previous series were well answered and centres are clearly passing on our advice to their candidates.

A range of responses were seen on all questions, including the multiple choice questions, and the paper yielded a wide spread of marks.

Question 1

(a) The three multiple choice questions were quite discriminating, with all discriminators being opted for by candidates. The one which was probably the most discriminating was the second question where a large proportion of candidates opted for glucose being the main carbohydrate transported in the phloem.

(b) We have asked for the various fates of GALP in the past but not specifically in the production of lipids. Candidates who had prepared for this exam using past papers answered this question reasonably well, but there were a large number of candidates who wrote about the production of GALP and not its fate.

Question 2

(a) A number of candidates were not specific enough in their answers to this question and simply wrote about the fact that the nuclei contain genetic material and were involved in the production of seeds. Those who did write about the specific role of each nucleus focussed primarily on the male gametes, with only a few mentioning the role of the tube nucleus in the production of the pollen tube.

(b)(i) Many candidates could tell us that the pollen could be used to identify plants that had been growing in previous years, but the majority of these candidates then related the number of pollen grains to temperature and not the specific species of plant growing.

(ii) Candidates clearly know the process of PCR and gel electrophoresis and gave long, detailed accounts. However, with only 3 marks being awarded, this detail was not creditworthy. Centres are clearly reading our feedback as there was a noticeable increase in the number of candidates now writing about the bands being compared, and not the fragments. However, some of these did not mention that the bands from the pollen had to be compared to the bands from known plant species.

(b) Candidates were not fazed by the unusual diagram used in this question but unfortunately wrote descriptions and not explanations. Some of those who did attempt an explanation linked the changes in pollen to climate change and not to human activity, probably because they had not read the wording above the diagram carefully enough.

Question 3

(a) There were two very common mistakes made in response to this question. Firstly, to name one of the domains as prokaryotes and secondly, to confuse eukarya with eukaryotes.

(b) Most candidates could tell us that viruses are not living organisms and therefore not included in a domain, in part (i). Far fewer candidates could explain why viruses contained only a few genes; the marks that were awarded were for those who happened to name a protein found in viruses.

(c) Most candidates selected either molecular phylogeny or proteomics for their answer to part (i).

Part (ii) scored pretty well as candidates clearly knew the process of translation and could pick up marks for recounting this process; only the more able candidates tried to describe the actual role of tRNA.

Candidates do have a problem explaining that one tRNA molecule can only bind to one **specific** amino

acid and this is something worth drawing their attention to, as candidates will write 'tRNAs carry their specific amino acids to the ribosome'.
We have not asked candidates what the term 'theory' means before and we saw some very good attempts to define the term. Candidates should be made aware that they need to know the meaning of any of the terms used in the specification.
(d) Candidates did struggle with this and many simply repeated information given in the stem of the question. We had hoped that the previous parts of the question would lead the candidates into thinking about the domains and the structure of viruses and that they would give one reason each for giant viruses neither being a virus nor an organisms classified in the current three domains.

Question 4
(a) Again, this trio of multiple choice questions were quite discriminating. A range of combinations were seen. A minority of students left parts of this question blank; candidates should be encouraged to at least guess a multiple choice-style question.
(b)(i) Most candidates knew what they were supposed to be writing about in their answer to this question but struggled with some of the wording and terminology associated with this spec topic. We really do need to know that the activated B cells **differentiate** into plasma cells and that it is the plasma cells that produce the antibodies. Some candidates lost a mark as they either did not make it clear that macrophages were presenting the antigen to the T **helper** cells or that it was the T **helper** cells that were involved in activating the B cells.
(b)(ii) We expected the candidates to suggest that the antibodies were broken down or removed from the body, but we were impressed that quite a high proportion used their knowledge of opsonisation to suggest that the macrophages engulfed the antibodies together with the virus.
(b)(iii) The focus of this question was the difference in the **changes** of concentration of antibodies, which some candidates failed to pick up on. Some candidates referred to the delay in the rise in antibody levels or the steepness of the graph. Others wrote two descriptions and not a comparison.
(b)(iv) Candidates recognised that the absence of memory cells were responsible for the differences between the response to virus Q and virus P. Many tried to explain that the response to virus P was a secondary immune response and the response to virus Q was a primary immune response but simply repeated the information in the question, referring to second infection and first infection respectively. Few candidates linked the presence of memory cells with the faster appearance of plasma cells and therefore a sooner and higher increase in antibody levels.

Question 5
(a) The less able candidates told us that the ambient temperature varied, and the more able candidates linked temperature to development time and enzyme activity.
(b)(i) This was a slightly unusual calculation, but we saw very few blank responses. The majority of candidates worked out that the earliest date for death was the 14th and a reasonable number correctly identified the value to use from the table and calculated the earliest time of death as well. The most common error was to calculate the latest time of death, but we allowed a consequential error for this.
(b)(ii) This question was poorly answered as many candidates saw the word 'reliability' and started writing about sample sizes, means and error bars. Those who tried to discuss the method given in the question tended to pick up the third mark point for the ambient temperature and then just trotted out everything that they had seen on previous mark schemes about position of body, clothing etc.

(b)(iii) Candidates appreciated what this question was asking them about but only picked up one or two marks, as they only discussed body temperature levelling off or rigor mortis not lasting long, without considering the factors affecting the extent of decomposition by microorganisms and insects.

Question 6

(a) Many candidates could calculate the ratio but there were quite a few candidates who expressed their answer as a fraction and not as a mean. We decided to ignore this if the correct ratio was given as well but decided that we could not accept it as an alternative.

(b) Unfortunately, we had the same issue with this question as we had with question 2 part (c); candidates were describing the data and not explaining it. Those candidates who did explain the data would pick up two or three marks but only the more able candidates linked the drop in number with animals dying and the rise in number with animals giving birth.

(c) Some of the responses focussed purely on the data in the table so we saw descriptions of data with possibly some attempt to explain it. Candidates who read the question picked up on the fact that they were instructed to use the information in the rest of the question and wrote about salmon being easier to catch than moose as they were smaller, and that the salmon were less likely to harm the wolves as they had no antlers.

Question 7

(a) Many candidates knew that the term for 'a species found in only one area' is endemic.

(b) We saw the whole range of suggestions for giraffe weevils wrapping their eggs up in the leaves, but only the more-able candidates gave two suggestions.

(c) Candidates made reasonable attempts to answer this question, but marks were lost for all the reasons that we have reported on in previous series. Some candidates wrote a generic description of evolution without referring to the evolution of the long neck. Others referred to the long neck but were vague about the selection pressures, not using the information given to them in the question. There was confusion about when to use the term gene and when to use allele.

(d) There were similar issues with this part of the question, with candidates writing generic answers and not using the information given in the question.

Question 8

(a) Asking candidates to effectively define the terms 'abundance' and 'distribution' has not been done before, and the majority of candidates made good attempts to define the terms. Abundance was better defined but there was confusion between number of species and the number of a species.

(b) Candidates either realised that we were asking about decomposition and scored reasonably well or else completely misunderstood what was being tested. Few candidates could tell us that the methane was produced by the bacteria in anaerobic conditions.

(c) Candidates could link the methane to global warming and an increase in the temperature of the atmosphere. However, the responses tended to give too much detail of the greenhouse effect and did not link the increase in temperature to an increase in photosynthesis.

(d) Questions testing this part of the specification are always answered well by candidates and this question was no exception. We did see errors that we have seen in the past, such as spreading the bacteria onto the petri dish (and not the agar) and not giving specific details of time and temperature of incubation.

Paper Summary

There were a surprisingly high number of blank responses this year, even for some of the multiple choice questions; these were distributed throughout the paper and not found only at the end of the paper. Candidates should be encouraged to attempt all questions, as they may pick up the odd mark that could make a difference of a grade. They should at least guess the answer to a multiple choice question.

Some candidates were repeating the question in their answer which not only wastes time but also gives them a false sense of security that they have written an answer of sufficient length.

Candidates need constant reminders about the meaning of the command words; we saw a lot of descriptions this series compared to explain questions. There will be new command words in the exam papers for the new specification and candidates will need teaching the expectations of these new command words.

Candidates should be encouraged to use the information in the question to write answers that specifically apply to the context of the question, for example question 7. This is going to be particularly important in the new specification exam papers.

Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom