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Examiners' Report

Principal Examiner Feedback

October 2021

Pearson Edexcel International Advanced Level  
In Biology (WBI15) Paper 01

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October 2021

Publications Code WBI15\_01\_2110\_ER

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The paper was the second cycle of the new specification and tested respiration, internal environment, coordination, and gene technology.

The scope of the questions provided a good opportunity for candidates to demonstrate their knowledge and understanding of these topics. The questions on this paper yielded a very wide range of responses with some excellent answers given. This resulted in a good spread of marks.

There were some parts of questions that were left blank but there was no evidence that candidates had insufficient time to complete the paper. Most candidates tried at questions on the article which was the final question. There were some straightforward questions demanding recall that yielded high marks across the cohort and some more demanding questions that discriminated well. There were many responses which were well articulated showing excellent use of biological technology in context.

However, it is still evident that some candidates do not pay sufficient attention to the command word used in the question. This is particularly true of compare and contrast questions where mere descriptions failed to gain the marks. Graphs relating to novel situations continue to present challenges to candidates. Many candidates did not refer to the data provided in the graphs and often failed to appreciate the axes of the graphs. Responses needing calculations were very varied. However there does seem to be an area that is improving as candidates become more aware of the nature and demands of this type of question. Clearly this has been a focus of both teaching and practice. Questions which demanded analysis, explanation, and application of knowledge to unfamiliar contexts were seen to be more challenging to candidates.

Many centres are clearly using our mark schemes and examiner reports to prepare candidates. This is particularly evident where similar mark points have appeared on previous papers. However, care must be taken not to just use the points from previous mark schemes without relating it to the context of the current question.

## QUESTION 1

In part a most candidates had a good understanding of skeletal muscle and were able to describe the role of Calcium ions in providing contraction.

In part b candidates scored highly when they did what had been asked, 'to explain' how the features of slow twitch fibres SHOWN in the table are of benefit to a marathon runner. Many responses were mere descriptions with no clear explanation.

In part c a good number of candidates made appropriate comments on the rate of heat loss during exercise. However, a significant number of candidates tried to explain what happens to heat loss during exercise and the nature of thermoregulatory control.

## QUESTION 2

In part a most candidates showed a good understanding of genetic engineering and could correctly describe the process to produce rice that contains beta carotene. Many however missed the idea of the first mark point 'to identify / isolate the gene involved in making beta carotene in bacteria.

In part b(i) there were many suggested possible risks but often they were vague and not clearly described. In b(ii) several candidates focused on a new risk rather than the ones listed in b(i).

## QUESTION 3

The two MCQs in part a did not trouble the candidates. In part b most candidates achieved full marks. The most common error was a failure to state 'up to 12au.' The calculation in in part b(ii) was generally well done with the answer given to an appropriate number of decimal places. Most candidates were able to give at least one reason why there could be objections to the use of mammalian retinas.

The MCQ in part c was well answered.

#### QUESTION 4

In part a most candidates were able to describe the negative feedback correctly but found describing positive feedback more of a challenge. Often just giving an example of positive feedback which did not gain credit. The MCQ in part b was well done, Candidates had a good understanding of the thermoregulatory mechanism, in part c(i) the explanations were often too vague to achieve full marks. In an explanation there needs to be a clear emphasis on 'how and why'. e.g., just stating pressure did not gain credit. Many candidates described the differing diameters of the afferent and efferent vessel without stating 'high pressure in the glomerulus'. In c(ii) the calculation was done correctly but the answer was not given to 3 significant figures as demanded in the question stem.

In d(i) The majority of candidates were able to make appropriate comments on the trial. In d(ii) the calculation was done well although the SD values did confuse some candidates.

#### QUESTION 5

The MCQs in part a were all well done. Candidates showed a clear understanding of the stages of aerobic respiration and RQ. In part b the calculation was done correctly by most candidates. The most frequent errors were a) the number of decimal places used and b) rounding up / down.

In part c the level-based question many candidates were able to discuss the information in the graph. The log scale proved to be a challenge to some candidates. It was pleasing to see that many candidates could attain level 3 through detailed comments on the graph and an understanding of both aerobic and anaerobic respiration in context to the size of the crocodiles.

#### QUESTION 6

The MCQ in part a were done well. In part b many candidates failed to accurately describe the role of DNA polymerase. Responses were often too vague e.g., omitting key words like 'complementary' and not being specific about the bond formed. In part c and d, the responses were disappointing. Candidates were 'phased' by the novel context – gene expression in an activated T lymphocyte. In part d few candidates were aware that cytokines can have different shapes. In part e several recent mark schemes have similar questions. However, the contexts were different, and candidates did not relate their answer to new context.

## QUESTION 7

The calculation in part a was done well coming up with the expected answer. We were disappointed in the responses to the compare and contrast question in part b. Candidates who had practised compare and contrast exemplars produced very good responses. Many just detailed the effect of drug A then drug B which gained no credit. Several just compared drug A and drug B to the saline (control). Explanations for part c was again disappointing. The 'change in HR' axis confused many candidates. There were a few succinct and clear responses, but the majority were vague and got the effect of drug A and B the wrong way round.

## QUESTION 8

The responses to this question varied greatly. Some candidates had clearly studied the article in detail. The majority however seemed to have little detailed knowledge of the contents of the article.

Part a was generally done well. It is a clear focus on the specification. Part b was another compare and contrast question and again this caused problems to candidates. Many described fMRI and CT scans rather than a real compare and contrast response. Comparisons need to be in the same sentence not as separate paragraphs.

In part c there were some good responses. However, few stated amyloid protein prevents the entry of bacteria into cells by disrupting the ability of the bacteria to the host cell. In part d most candidates could explain how the bacteria get from the infected gums to the brain via the blood brain barrier. The best candidates made reference to the release of histamines which resulted in vasodilation. In part e most candidates recognised that gingipains were enzymes and resulted in the loss of brain tissue leading to memory loss, few suggested the enzymes broke down cell membranes. Part f was not done well. Many candidates made reference to microarrays but had little detailed understanding of how the process works. Few candidates made reference to the extraction of the infected material from the cortex.

## SUMMARY

A few suggestions for improving candidate performance are given below.

- candidates need to study the article.
- candidates need to refer to the command word used in the question and focus their answer on an appropriate manner. Appendix 7 in the specification lists all the command words and their meaning.
- in graphs candidates need to check the labelling of the axes and scales.
- in level-based question the graph / table needs to be used as well as relevant knowledge and understanding
- in calculations it is better to show the workings as well as an answer as if the answer is incorrect candidates may gain some credit for correct working.