Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

Summer 2019

Pearson Edexcel Advanced Subsidiary In Biology (8BN0) Paper 02 Development, Plants and The Environment

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The performance of candidates in this series was slightly lower than that of the year before. Although there were a spread of marks for all candidates across the paper, there was a shortage of detailed in-depth responses that would achieve full marks in the 4, 5 and 6 mark questions. There were, however, some exemplorary answers in all questions showing a depth of understanding and an ability to apply knowledge to the questions asked.

In general, the multiple choice questions were answered well and no distractors were significantly chosen.
The items relating to core practicals divided candidates on their ability to tailor their response to the question.

Question 1

1(b) Candidates were able to identify the role of the environment and in better responses there was a clear link between a specific factor and the effect it has on height. In a similar manner, candidates were able to refer to the role of genetics although few were explicit in the link between the two.
Many references were made to height being "polygenetic" rather than polygenic.

Question 2

2(b)(ii) A variety of responses were seen here. The majority were able to gain the mark, many referring to reproductive isolation leading to natural selection.

2(c)(ii) Most candidates gained multiple marks here. It was pleasing to see the large number of responses being written in the context of the question. A small number of candidates were able to list the differences between organelles but then linking them incorrectly to the wrong type of cell. No credit was given to statements describing what would not be seen as the context of the question required what would be present.

Question 3

3(a) The majority of students correctly idntified mitosis as the form of division.

3(b)(ii) A large number of responses gained full marks. The majority of errors involved the incorrect conversion to micrometres.

3(b)(iii) The average response scored less than half marks in this question. A number of misconceptions were apparent, the first regarding the change of temperature. Many candidates suggested using waterbaths at different temperatures to see the effect on cell division. No credit was given to candidates who were not growing the plants at the range of different temperatures. The term meristem seemed to be misunderstood with candidates attempting to "grow meristems".

Question 4

4(b) Almost all candidates understood the need to extrapolate the graph to 2020. The results shown were mainly in the accepted range with only a few developing a curve that ended a lot higher than accepted.

4(c)(i) In general, candidates had the right idea in answering this question but lacked the clarity to gain full marks. Many gave both alternatives to the second marking point but did not link this to the storage.

4(c)(ii) This question scored lower than expected. There were some excellent, well constructed responses that showed a full undersatnding of the role of seedbanks. There was a common confusion where candidates referred to the seeds having medicinal purposes rather than the plants themselves. Although not penalised many referred to “medical” rather than medicinal.
Responses were frequently seen that missed the idea of extinction or reintroduction instead referring to managing populations.

4(d) The majority of candidates gained one mark. Candidates were much clearer about the concept of species richness although there were many variations in the descriptions. Although not approved, the word “amount” was not penalised. Heterozygosity index proved more difficult with few candidates linking the idea of proportion to there response, often referring to the number (or amount) of heterozygotes.

Question 5

5(a) Candidates showed a good general knowledge of cellulose structure, often quoting everything they knew starting with glucose molecules. There were few marks given for the links to tensile strength with the majority of responses quoting “makes cellulose very strong”.

5(b) This question, similar to one in a previous series was scored well. One commonly seen answer was the idea of growing more bamboo fibres rather than growing bamboo itself. There were a number of candidates however that instead referred to the biodegradeable properties of Bamboo and scored no marks.

5(c) As a core practical, this was a question that saw many similar responses that showed an understanding of the practical technique. Few candidates linked the techniques to the data in the question and therefore missed the first marking point.

Question 6

6(a) This was a high scoring question. Candidates frequestly discussed the energy requirements of having two flagella and although this did not adversely affect their score it added unnessecary detail to the question. Candidates falling short of full marks often stopped short of fertilisation in their explanation.

6(b) There was a tendency for candidates to describe each graph in turn. This typically generated a mark for lowering sperm count. By describing the abnormal sperm graph candidates often neglected to mention the increase caused by MMS.
There were few attempts to “deduce” the effect.

6(c) As a levels based question this produced a range of responses at each level. Few candidates went much beyond the detail from the graphs. Better responses linked the potential from the

graph to the limitations of the trial. A few candidates gave a full account of three stage trials that, although detailed, did little to show sustained linkage to other scientific ideas.

Question 7

7(a) There were some excellent descriptions of aseptic technique that showed a familiarity with the practical skills involved. The main misconception was the use of the bunsen burner to kill airbone bacteria rather than to produce a convection current.

7(b)(i) Most candidates scored 1 mark here by stating that there were additional bacteria present, although few described the appearance of the plate. Those describing the plate often commented on the uneven distribution of the bacteria rather than the different shape, size or 'colour'.

7(b)(ii) Although this question often awarded 1 mark, there were few clear responses. Many candidates referred to 25°C as being the optimum temperature for the growth of bacteria. Otherwise there were many that thought that the same bacteria "became pathogenic" at higher temperatures. Similarly, the suggestion that bacteria do not grow or reproduce at lower temperatures was not credited.

7(c)(i) Most candidates scored well on this question with more than half arriving at the correct answer. There were a number of candidates that chose the wrong sample.

7(c)(ii) This question did not score highly. The majority of candidates chose to describe the order of antimicrobial effectiveness, achieving one mark. For those that referred to ranges, there were many that referred to R and S overlapping, while only referring to Q being the largest. To get full marks a candidate had to resist the idea of there being a "best" extract.

Question 8

8(a) More than half the candidates gained no marks here. Although challenging and near the end of the paper, this was disappointing for a calculation where the equation had been given. The number of carriers was often missed with the answer left as a fraction.

8b(i) Most candidates were able to relate a sex linked disorder to a sex chromsome. Although the difference between patterns of inheritance was present in many responses, a common misconception was that it would only present in males.

8(b)(ii) A challenging question that produced few marks but really highlighted the higher attaining candidates. Those candidates that related to the equation and therfore discussed alleles did well. Without reference to the equation, the majority of candidates were only able to gain credit for reference to lack of carriers.

8(b)(iii) Candidates were able to define stem cells and link this to the production of new muscle cells. The most common response linked the idea of specialising cells by producing a protein "that permanetly altered the structure and function of the cell", rather than the dystrophin needed to maintain muscle cells and therefore gained no further marks.

8(c) The standard response seen gave a stock answer about epigenetics in general. A few candidates were able to link this to the stem of the question and how epigenetic markers are passed on.

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