Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

November 2021

Pearson Edexcel GCE In Biology A Salters Nuffield (9BN0) Paper 1: The Natural Environment and Species Survival

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1(c) the majority of strudents were able to give the equation linking respiration, GPP and NPP but there was a lot of confusion as to its meaning. The link between glucose converted to biomass and glucose used in respiration was often not understood, and many students seemed to think that respiration uses energy.

1(d)This is an area where most students have a good level of knowledge and understanding. Most students were able to explain why burning wood chips does not lead to an overall increase in carbon dioxide, with many gaining full marks.

2(b) Many students were able to clearly descibe the process invoved in electropheresis. Some marks were lost by not explaining what what was compared. A number of students wasted time by also describing the PCR process at length, which was not required.

2(c) Many students failed to gain marks on this question because they did not explain how the bands were compared. The better candidates were able to link the similarities with evidence for inbreeding, but some candidates refered to close relationships, not relevant in this question.

3(a) This question concerned the Hardy-Weinberg equation. Many candidates were able to state the equation, but only a few were able to select the correct numbers to put in the equation.

3(b)(i) This was a question about tuskless elephants and why their numbers would continue to increase. Many candidates gave a generic answer about Natural Selection, explaining why poaching had led to an initial increase in elephants without tusks but failing to realise that the poaching has now stopped but the high allele frequency will lead to an increase in homozygous recessives. Full marks are rarely gained from generic answers and it is important that candidates apply their knowledge in the context of the question.

3(b)(ii) This question was not answered well. Many candidates simply described what the equation shows, rather than how it can be used.

4(b)(i) The majority of candidated can clearly explain what a totipotent cell is.

4(b)(ii)Many students knew that genes were switched on, but marks were lost by not stating what switches them on. Most students understood that only activated genes are transcribed and many stated that a protein was produced, but often failed to link it to cell modification .

4(c)This seems to be an area in which there is a lack of detailed knowledge. Very few candidates gained full marks and many did not score at all. Many answers failed to distinguish between the acetylation of histones and the methylation of DNA, with a generalised description. Changes in gene expression was the most common mark.

5(a) This was a question about the role of zoos. Most candidates gained a mark for describing at length the role of breeding programmes, but few candidates described the other roles of zoos. Of those who talked about protection, not all stated what zoos protected animals from.

5(b)(i) Most candidates were able to state the meaning of habitat, although some incorrectly linked it to environment.

5(b)(ii)This question asked candidates to discuss the information that needs to be collected to compare biodiversity in two woodlands. This was not well done. Many candidates talked about finding the biodiversity, which is in the stem of the question, without mentioning a diversity index. Most candidates recognised the need to find species richness but many of those who talked about genetic diversity did not make the link with a species or population.

6(a) Most candidates described the phospholipids in the cell mambrane, explaining the link between the structure of the phospholipid and the formation of the bilayer. The majority of candidates knew that the cell membrane is made of proteins and phospholipids, although in many cases this was not given as a clear statement but a description of the role of different proteins. The description of the fluid mosaic structure was not seen as often as may be expected.

6(b)Most candidates recognised that oxygen uptake would be reduced. Many recognised the impact of the change in shape on surface area, but a number of candidates failed to link it to the SA:Volume ratio and did not gain the mark. The better candiadtes stated that oxygen enters the cells by diffusion.

6(c) Most candidates were able to use a genetic diagram to calculate the correct probability. A few had a preconception that the probability would be 1 in 4 and tried to make the data fit this.

7(b)(iv) Many candidates were able to carry out this calculation. Some lost a mark by incorrectly converting the units.

7(c)Students in general have a good overall knowledge of sustainability and climate change but they confuse the two and often lack specific details. It is important to read the question carefully and select the information required, then give precise answers. This is an explain question; in order to gain marks it must say why nettles are renewable and why oil is a finite resource.

8(a) Most candidates are able to state what a bacteriostatic antibiotic is.

8(b)(i) Candidates demonstrated a good understanding of the role of the ribosome in protein synthesis and many of them were able to use their knowledge to explain how these antibiotics may affect protein synthesis.

8(b)(ii) This question required candidates to apply their knowledge to information given in order to Deduce uses of the new antibiotics. This is

a high demand question and only the better candidates were able to successfully develop their answers sufficiently to score marks. Answers to questions of this nature need to be precise and detailed, for example marks were lost by candidates who correctly stated that the mutation was not present but failed to explain that the mutation gave resistance.

8(b)(iii) This level based question asked candidates to apply knowledge of a core practical to the testing of the new antibiotic. Many candidates gave a good description of how to test antibiotics, gaining level 2 with 3 marks. Only a few went on to reach level 3 by putting the investigation into the correct context, using bacteria resistant to other antibiotics, using several strains and using a range of antibiotic concentrations. Students should be encouraged to consider the context of these questions, full marks will not be achieved from a generic answer.

9(b)(i) This question concerned HIV entering cells. Many answers did not score because they lacked sufficient detail. At this level, students are expected to be able to name the attachment proteins as glycoproteins and state that it is the viral envelope that fuses with the cell membrane.

9(b)(ii) There were a number of vague responses referring to a weakened immune system, but candidates also lost marks because they did not answer the question. They were able to describe the role of T helper cells in detail, but did not expain the impact of reducing the number of T helper cells.

9(c)(i) This question required candidates to make deductions from the information given and their prior knowledge. Many failed to score because their answers were too vague and lacked specific detail. Students needed to identify that the protein concerned is a receptor in the cell membrane and link it it T helper cells and the glycoprotein on HIV.

9(c)(ii) This is another question where many of the answers were not specific enough to score marks. Students should be able to identify the different types of T cells and explain their roles.

10(a) The majority of candidates were able to correctly calculation the change in carbon dioxide concentration.

10(b) Candidates were asked to explain the data they were given. Weaker candidates described the trends in detail but were limited to one mark because they failed to give a reason. Surprisingly few candidates made the link to photosynthesis.

10(c) This question expected candidates to make the link between RUBISCO and the light independent stage of photosynthesis. Without this link, it is difficult to score more than one mark. It is important to consider all the information given and think about the links to the question.

10(d)This was a level based question with the command word "Discuss". There were some strong answers with logically structured points addressing the data given. In order to reach level 3, data on the effect of temperature on RUBISCO needed to be included, as well as the cosequences of changes to growth, such as developmental changes.
A number of candidates described the causes and general effects of climate change without referring to the data.

Overall most students were able to attempt the questions. In order to achieve the highest marks, it is important to read the question carefully and consider the context. Students are expected to demonstrate their ability to apply knowledge to unfamiliar situations and full marks will not be gained from generic answers. Command words should also be considered, for instance "Explain" questions require a reason rather than just a description.

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