



Examiners' Report
Principal Examiner Feedback

January 2023

Pearson Edexcel International GCSE
In Biology (4BI1) Paper 2BR

This January series was another opportunity for students to take the reformed Edexcel International 9-1 GCSE.

The examining team commented on the knowledge and understanding shown by the students on this January's papers. Most students were able to apply their knowledge and understanding of biology to analyse and evaluate data and information from unfamiliar contexts and experiments. Many centres have worked hard to prepare students for the examination, and this was reflected in the responses of these students. There was no evidence of students being short of time on this paper. A very small proportion of students did, however, leave some items unanswered.

Question 1 provided students with a passage about Antitranspirants. The passage contained information about chemicals used to reduce water loss from plant leaves.

In part 1 (a) students were asked to explain why plants that have been dug up and transported are at most risk of drying out. Most students scored with many gaining full marks. These answers included plants with damaged roots not being able to absorb water from the soil but still losing water by transpiration. In part (b) students were given a photograph of part of a leaf surface and asked to use this to determine the number of stomata per mm^2 on this leaf surface. Examiners were pleased to note that most responses gained marks with many attaining full marks. In part (c) most responses could explain why stomatal regulators reduce photosynthesis with reference to stomatal apertures becoming narrower and thus reducing the absorption of carbon dioxide. In part (d)(i) students were asked to explain why reflective compounds should only be applied to the upper surface of a leaf. Most explained that this would avoid blocking the stomata that are on the lower surface of the leaf. In part (d)(ii) most students were able to explain why reducing leaf temperature reduces transpiration rate. Some responses wrote about the effect on enzyme substrate collisions rather than increasing diffusion or evaporation so did gain full marks. Part (e) asked students to describe the role of one named mineral ion in plant growth. Most described the role of magnesium or nitrate ions. The final item based on the passage required a description of how water is transported from the soil to the leaves in plants. Many scored full marks for this item.

Question 2 gave a diagram showing a section through a human kidney with some structures labelled. In part (a) almost all students could identify the nephron, the liquid carried in the tube labelled S and the ureter. Item b(i) gave students a table showing an analysis of the composition of urine from three patients with problems in kidney function. The students had to discuss which processes in the kidney may be affected to produce the results shown. The examiners were again pleased at the number of responses that attained high marks for identifying the process, its location and the failure that produced the

results. In part (b)(ii) most students were able to describe how to test for glucose in a sample of urine.

Question 3 gave students a table of data with the numbers of three different wildflower species, A, B and C, so that they can compare the biodiversity in two fields. In part (a)(i) almost all students could calculate the mean from the data provided. In part (a)(ii) students were asked to describe how the scientists could determine the number of each plant species per m² in each field. Most scored 2 or 3 marks. Some responses did not earn full credit as they described counting the number of species present rather than the number of each species present. In part (b) students were required to discuss what the results show about the distribution of species in each field and the difference in biodiversity between the two fields. Most students gained some credit but only the best responses gained full marks for noting that more species were found in field X and that the relative numbers of each species was even. Thus, field X had a higher biodiversity. Only the best responses noted that in field X the individual quadrat counts varied most for species B and varied least for species A. Some responses also noted that the data set only had 3 counts so was not reliable. In part (c) most students could identify an abiotic factor that could affect the distribution of the plant species.

Question 4 presented a diagram of showing part of a molecule of DNA. In part (a) many students were not able to state that a genome is all of the DNA of an organism. In part (b) most students were able to describe the differences between the structure of DNA and the structure of RNA with many gaining full marks for describing that DNA is a double stranded helix, that DNA contains the pentose sugar deoxyribose, and that DNA contains the base thymine. Part (c) asked students to describe the roles of RNA in protein synthesis. Again, many students were able to gain full marks for this item.

Question 5 gave students a diagram showing part of the female reproductive system with some structures labelled. In part (a) most students were able to name the structures labelled in the diagram. In part (b) students had to describe the role of the uterine wall in reproduction. Only the best students were able to describe the role as providing a site for implantation, growth of the placenta and provision of glucose, oxygen and removal of carbon dioxide from the embryo. In part (c) students were given a graph showing the changes in the levels of hormones released from structure B during one menstrual cycle. They were then asked, in part (c) (i), to explain the importance of the changes in hormone M and hormone N during the menstrual cycle. Most responses scored some marks with an even spread of marks across the range. The best candidates were able to explain that M is oestrogen, and it increases and peaks before ovulation. Oestrogen repairs uterine lining ready for implantation. Progesterone increases after ovulation and maintains uterine lining and a drop in progesterone causes menstruation. In part (c)(ii) most students could describe the role of one other named hormone in the menstrual cycle.

Question 6 gave students a graph showing the number of cases of measles, from a region of the United Kingdom, each year, and the percentage of five year-olds vaccinated between 1950 and 2016. In part (a) students were asked to determine the difference in the percentage change in the number of cases of measles between 1950 and 1965 and the percentage change in the number of cases of measles between 1968 and 1983. Despite this being a difficult calculation, many students were able to correctly calculate the percentage change for each period but then some failed to take into account that between 1950 and 1965 there was an increase but between 1968 and 1983 there was a decrease. These responses gained credit for the stages of the calculation they had completed. In part (b) students were required to explain the relationship between the number of cases of measles and the percentage of five year-olds vaccinated. This item again produced the whole range of scores with only the best students gaining full marks. The marking points are detailed in the published mark scheme. In part (c) students were told that some children are receiving treatments that reduce the activity of their immune system. The students then had to explain why vaccinations are not used on these children. Only the best responses gained full marks for explaining that these children would not produce antibodies or develop memory cells.

The last question required students to complete a passage containing information about using micropropagation to produce plants. Almost all responses gained some credit with many scoring high marks.

Based on their performance on this paper, students are offered the following advice:

- ensure that you read the questions carefully and include sufficient points to gain full credit.
- in discuss and comment items include as many points as there are marks available and remember to use all the information in the question and your own knowledge.
- make sure you have practiced calculations especially percentage change.
- show all stages of working in calculations, so that if the final answer is incorrect some credit can still be gained.
- write in detail and use correct and precise biological terminology.
- ensure that you are familiar with all the content, including the practicals included in the specification.
- at the end of the paper read through your answers to make sure you have fully answered the questions.