



Pearson
Edexcel

Examiners' Report

Principal Examiner Feedback

November 2020

Pearson Edexcel International GCSE

In Biology (4BI1) Paper 2B

General Comments

The examiners were impressed with the high standard of many of the answers seen. Many students have clearly worked very hard for this autumn series of exams and their answers often reflected an excellent understanding of topics from all areas of the specification. It is pleasing to see how well students have adapted to the new specification and style of questions and centres are preparing the students very well for the examinations. Some students still find analysing unfamiliar data challenging and there were some students who found questions on core practicals challenging. Students should ensure that they are familiar with all the core practicals listed on the specification and also fully understand what constitutes a valid experimental method.

Question 1

The comprehension was generally talked very well by many students. Many answers demonstrated that the students had read the extract carefully and were able to apply their knowledge of the specification to the questions.

(a) Many students correctly identified that ultrafiltration occurs in the kidney.

(b) This question required students to read the comprehension and then suggest three methods by which the risk of infection with schistosomes could be reduced. Many students recognised that avoiding contact with lake water, only drinking treated water, removing snails, vaccinating and improving sanitation could reduce the risk of infection. Some students gave three similar answers and students should always try to give distinctly different points when asked for more than one point.

(c) Many students were able to identify two blood cells. The question asked students to give only two cell types and some students gave lists of more than one – when asked to give a set number, students are not encouraged to give additional suggestions.

(d) This question was found to be challenging by many students and some did not correctly convert the value from grams to milligrams

(e) Many students were able to multiply the percentage by 240 million but only stronger students correctly converted the percentage from standard form.

(f) Most students were able to correctly state that plasmids are circles of DNA although a common error was to select option C suggesting that plasmids are circles of protein.

(g) This question tested students' knowledge of immunity. Stronger answers correctly stated that the proteins were antigens and so caused the production of memory cells that would produce more antibodies faster and sooner.

Students should always state that the production of antibodies during the secondary immune response is faster, sooner and in higher quantities.

(h)(i) This question tested students' understanding of the scientific method and the need for control experiments. Stronger answers correctly suggested that a placebo vaccine or a vaccine that contained a substance other than the plasmid could be used. Some students suggested that the control group would have no treatment which was not quite the same as the idea of a treatment without the plasmid.

(h)(ii) This question required students to analyse the effectiveness of the vaccine and recognise that the results showed that it reduced the number of parasites, but some still remained. Stronger answers stated that the number of parasitic worms was lower after the vaccine compared to the control group, manipulated the data and also stated that some parasites were still present. Some students also explained that the experiment would need more repeats and there was no information about the age or health of the groups.

Question 2

(a)(i) Many students were able to correctly state that blood clotting prevents the entry of pathogens and prevents bleeding. Some students gave vague statements such as stopping germs entering and / or allows a scab to form – students should make sure that they are aware of all the listed points on the specification.

(a)(ii) This question was found to be challenging by many students. A significant number of students drew a characteristic rate graph rather than sketching a graph of the time taken.

(b)(i) Strong answers stated that transgenic organisms have genes from other species. A significant number of students gave insufficient detail stating that the genes are from other organisms and some mistook the term transgenic for 'clone' and suggested that transgenic organisms are genetically identical.

(b)(ii) Many excellent answers that gained full marks were seen and many students are very familiar with the terminology used in the cloning of whole organisms. Some students mistakenly gave accounts of genetic engineering. Another error that was observed was the suggestion that fertilised eggs are used.

Question 3

(a) This question required students to identify the spinal cord as part of the central nervous system. Some students incorrectly referred to the vertebral column.

(b)(i) Many students were able to determine the probability of producing a child with Huntington's disease from a heterozygous and homozygous parent as 0.5. Some students assumed that the result would be 0.25 which would occur if both parents were heterozygous.

(b)(ii) This question required students to use the correct symbols for the sexes of the children and their phenotypes. Many students completed this correctly although a few suggested that one of the children would be affected.

(c) This question was found to be challenging by many students. It tested students' understanding of translation and required them to suggest why translation would not occur. Some students gave excellent answers that explained that the mRNA would not bind with ribosomes, translation would not occur, and the protein would not be produced. Some students suggested that a different protein would be produced and several confused transcription with translation.

Question 4

(a) Many students were able to give the balanced symbol equation for photosynthesis. Common errors were giving the equation for aerobic respiration and confusing oxygen and carbon dioxide.

(b)(i) This question was found to be challenging by a number of students. Many were able to correctly calculate a mean value but only stronger students recognised that the data required the removal of the anomalous value. The question steered students to identify the anomalous value but many did not notice this.

(b)(ii) Many students found this question challenging and a significant number did not recognise that the question required an explanation rather than a description. Students should be careful to read the command word before writing their answers. Stronger answers recognised that photosynthesis was fastest when there was no filter and went on to explain that there would be more wavelengths of light available. The best answers also explained that rates were low with green light as chlorophyll does not absorb green light, and that as blue and red light are absorbed, rates are higher.

(b)(iii) Many students were able to correctly suggest that carbon dioxide concentration, temperature and light intensity would need to be kept constant. A few students confused the experiment with a transpiration experiment and suggested that humidity and wind speed should be kept constant.

(c)(i) This question required students to identify why counting bubbles is an inaccurate method. Strong answers explained that the sizes of bubbles would not be the same, the contents of the bubbles may not be entirely oxygen and that the bubbles can easily be miscounted. Some students gave vague

answers that often referred to human errors without stating that this could be due to miscounting.

(c)(ii) Good alternative methods that were suggested included the use of gas syringes and measuring cylinders to measure the volume of oxygen produced. Some students incorrectly stated that the volume of carbon dioxide produced could be measured. Students should try to give precise answers and refer to volumes rather than using the term amount. A surprising number of students suggested measuring the mass of plant before and after the experiment.

Question 5

(a) Many excellent answers to this question were seen and many students have an excellent understanding of the roles of the hormones involved in the menstrual cycle. Some students confused the structures in which the hormones are produced, and others thought that FSH stimulates ovulation.

(b) Many students gave good definitions of menstruation, but others gave vague details such as simply stating that menstruation is bleeding. Others stated that menstruation is both the release of eggs and the monthly breakdown of the uterus lining.

(c) Many students were able to complete this calculation to determine the maximum number of eggs that a woman could release but a number did not notice the instruction to give the final answer to two significant figures.

(d) This question required students to suggest a reason why females do not produce as many offspring as the number of eggs she releases. Many students correctly stated that not all eggs are fertilised or that some eggs are not fertile.

Question 6

(a)(i) This question required students to identify the features of root hair cells and then explain how this provides a large surface area. Many students correctly stated that the cells have a large surface area but some students did not explain that the cell is elongated or has a projection. A common error was to discuss the thickness of the epidermal layer as a whole rather than focus on the structure of individual cells.

(a)(ii) Some students showed an excellent understanding of transpiration and gave a full explanation of how water is taken up by osmosis and moved to the leaves in the transpiration stream. Students need to be careful when explaining the gradients involved with osmosis and should make it clear that they are referring to solute concentrations or water potentials.

(b) Some very strong experimental methods were given that explained how volume and weight potometers can be used. Several answers included correct

precautions, such as cutting the shoot under water. Students should be careful to include a reference to time when determining a rate. Some students confused this experiment with photosynthesis experiments and suggested counting bubbles of oxygen.

Summary

In future examination series, student are advised to:

- be familiar with all the core practicals
- understand what all the command words require
- use precise and accurate language
- give calculations to the required number of significant figures if asked
- ensure that the detail in answers is sufficient for International GCSE standard