GCSE

BIOLOGY

8461/1F – Paper 1 Foundation
Report on the Examination

8461
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General Introduction to the November Series

This has been an unusual exam series in many ways. Entry patterns have been very different from those normally seen in the summer, and students had a very different experience in preparation for these exams. It is therefore more difficult to make meaningful comparisons between the range of student responses seen in this series and those seen in a normal summer series. The smaller entry also means that there is less evidence available for examiners to comment on.

In this report, senior examiners will summarise the performance of students in this series in a way that is as helpful as possible to teachers preparing future cohorts while taking into account the unusual circumstances and limited evidence available.

Overview of Entry

This examination had a total entry of 134 compared to an entry of 19 175 last year. This year, the percentage of entries from private students and entries from Further Education were approximately 4 times higher than usual. The percentage of entries from independent schools was down by half.

Despite the small cohort, the mean mark awarded this year was broadly comparable to the previous series. Generally, the standard of written communication was weaker in this year's cohort compared to last.

Comments on Individual Questions

Questions 7 and 8 were common with Biology Paper 1 Higher Tier.

Question 1 (low demand)

A common misconception seen in **01.4** was that the mitochondria are the site of glucose production. In **01.7**, several students didn't appear to read the question carefully enough, with some subtracting 15 from 60, and some multiplying the values. Students are advised to check their answers carefully, as 60 ÷ 15 = 3 was seen on multiple occasions. In questions where students are asked to calculate magnification, care must be taken not to give (incorrect) units.

Question 2 (low & standard demand)

In **02.3**, whilst there is no expectation for students to use a protractor to measure angles, this was occasionally seen. **02.7** was not answered well due to weak use of language, with 4% of students gaining both marks, and 23% gaining one mark. Many students talked generally about new cells replacing the old ones, and some new cells actually 'fixing' or repairing the damaged cells. The idea of stem cells 'adapting' was a common occurrence, as was a repeat of the stem of the question, in relation to stem cells becoming specialised. A few students thought that stem cells were made of plastic or metal (confusing them with replacement heart valves). There was confusion from some students regarding the bone marrow itself being damaged.

Question 3 (low & standard demand)

Throughout this question, students commonly used the term 'infection' as a synonym for bacteria, resulting in many unclear answers. **03.9** differentiated well between lower- and higher-attaining students.

Question 4 (low & standard demand)

Students are advised to take care when reading the stem of each question; several students described the heart rate in **04.1**. In **04.4**, a comparative answer was required, and stating numbers, without qualification, was not creditworthy; just over half of students achieved this mark.

In **04.5**, very few students (28%) accessed Level 2 and above. Many students didn't realise that the question was asking for an explanation of the effects of exercise, and not a further description of the trends shown in the graph. In those responses that did address the effect of exercise, respiration was commonly used as a synonym for breathing, and many students talked about sweating and 'burning calories' unnecessarily. Many students made a comment about the age of the man and the fact his age had an (often negative) implication on his fitness levels.

Question 5 (low & standard demand)

As in previous years, many students missed heating the Benedict's solution in **05.5** and several confused this test with the test for starch. 25% of students scored at least one mark in this question. It was clear that a large proportion of students were not familiar with this experiment, and in these cases, students suggested splitting open the cells and looking for the glucose using a microscope which has not been seen in previous years. 22% of students gave no response to **05.5**.

Question 6 (low & standard demand)

A lack of specificity in use of scientific language meant that few students were able to accurately articulate their ideas in **06.2**, resulting in a high level of discrimination between lower- and higher-attaining students. Many students referenced thick cell walls, lots of muscle in cells, as well as arteries having a large surface area.

06.3 highlighted that some students may not have been exposed to alternative images of blood cells, and many thought that the blood cells were actually cell parts, such as nuclei and cytoplasm. Half of the students gained marks in this question.

In **06.7** several students were able to make the link between platelets and blood clotting, but many incorrectly stated that the blood would clot too much as a result of reduced platelets.

Question 7 (standard demand)

The equation for photosynthesis had been generally well learnt, with two-thirds of students scoring at least one mark. **07.2** was not answered well, with the reference to 'energy' leading some students to write confused accounts about respiration. Nearly two-thirds of students were able to identify the anomalous result in **07.4**. In **07.5**, reference to 'human error' on its own was insufficient.

The concept of denaturation in **07.8** was not acknowledged by most students, as they were unable to make the link between photosynthesis and enzymes. Students are advised to read and follow all of the instructions given when asked to draw a graph, as in **07.9**, many students missed key tasks despite them being listed clearly. Students need to understand how to draw a line/curve of best fit when the plots do not fall on a straight line and students generally could be more accurate when plotting points, particularly those that are not whole numbers. A few students plotted the three individual repeats for each temperature rather than the mean, which meant that no plotting marks could be awarded.

Question 8 (standard demand)

The use of the term concentration gradient was confused by many students throughout this question. Movement 'along/across' a concentration gradient gives no clear indication of direction and requires further qualification; movement to/from a high/low concentration 'gradient' is incorrect. Some students described cells moving, instead of ions or particles. Some students had simply not learnt the definition.

Students should take care when reading the command word for each question. **08.3** asked for explanation(s), and without this, Level 2 and Level 3 could not be accessed. Very few students showed any detailed knowledge of the adaptations of the lungs; few could name the alveoli and the term 'bronchioli' as a hybrid of bronchioles and alveoli was commonly seen. Some students also stated that the alveoli contained villi. It is important to note that the alveoli having 'moist linings' is not a creditworthy answer to a question about adaptations for gas exchange. The gas exchange surfaces are moist **due** to diffusion, and therefore, a moist surface is a feature of the lungs but not a feature that maximises the diffusion of gases.

Osmosis and active transport were often confused in **08.5** and whilst nearly half of students were able to name active transport as the method of transport in **08.6**, less than 20% were able to go on to explain the process in the context of the question.

Concluding Remarks

Generally, performance on this paper was broadly comparable to previous years. Students generally scored well on simple recall of knowledge questions (AO1) and the topics of cell structure and immunity were well answered. Students were less confident in their knowledge and understanding of stem cells and differentiation and many could not apply their knowledge to new situations effectively (AO2).

Many students lacked the ability to articulate their thoughts logically and clearly on paper and a lack of comparative answers was common. As in previous years, details of the Benedict's test for sugar had been poorly learnt and students continue to struggle to understand how protein is used in living organisms. Students' understanding of command words was weak. Many 'explain' questions throughout the paper were answered in descriptive terms and students are advised to check the command word for each question before putting pen to paper.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.