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General Certificate of Secondary Education

Additional Science 4463 / Biology 4411

BLY2F Unit Biology 2

Report on the Examination

2009 examination – June series

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Additional Science / Biology
Foundation Tier BLY2F

General

The great majority of candidates appear to have been entered for the appropriate examination tier. However, there remains a small but significant number who may well have fared better, had they been entered for the Higher Tier examination.

The examiners are pleased to note the continued rise in the number of candidates who write their answers in black ink or black ball pen, as requested, and thanks must go to centres for their efforts in ensuring that their candidates comply with this request.

The quality of written English, particularly of low-achieving candidates, can be a problem, however only a handful of responses prove to be almost illegible. Centres are reminded that the use of scribes is permitted in appropriate circumstances. However care should be taken with the use of transcription, in several cases examiners were able to award marks for original work that would not have been awarded on the basis of the transcription.

Although adequate space for detailed responses is provided within the question/answer booklet a surprising number of candidates extend their answers beyond the lines, into a variety of spaces around the paper and onto additional sheets. Although this can prove more difficult for examiners, candidates' marks are only affected if this additional work is extended into the margins around the paper which will be lost by the scanning process.

As is usual in reports, the examiners are keen to encourage candidates to read the information and the questions carefully before embarking on their answers. Failure to do this often costs valuable marks, even from very good candidates. This was perhaps most noticeable in parts 1(b) and 8(a)(i), with the command word describe often interpreted as explain in the latter.

Question 1

It was hoped that this question would prove to be a fairly straightforward introduction. However many candidates found ways of getting answers wrong

(a) Here candidates who simply read the four possible answers, without reference to the question could easily tick any of the boxes, as they were all correct statements. It was only those candidates who read the stem of the question who realised that only the second statement was an answer to the question. Consequently little more than half the candidates chose the correct response, with some choosing to tick two, three or even all four boxes, despite the clear, emboldened instruction to tick **one** box.

(b) The theme of not reading the information and question carefully was continued in this part.

The information indicates that both Diagrams 1 and 2 show plant cells. However, many candidates appear to have looked for differences between the two cells in the diagrams, arriving at answers such as animal cells have chloroplasts, they have a different shape or the vacuole has a long extension. Other candidates failed to recognise the importance of the precise wording of the question and apparently described an animal cell, it has no cell wall, rather than the plant cell. In this case, candidates are reminded to ensure that any use of the word it should be absolutely clear, the examiners best

advice being to avoid this term if possible. Despite these pitfalls, that many candidates fell into, a good number gave clear and precise answers.

Question 2

(a) The correct answer **A** was selected by little more than a third of candidates. It is difficult to know why answers such as **B** and **D** would be chosen when these show similar concentrations inside and outside the cells. Inevitably some candidates who struggled with the concept that molecules move from higher to lower concentrations merely guess, however a number of these candidates gave themselves no chance of getting the mark by ticking the answer box.

(b) (i) The distracter respiration proved rather too attractive for many candidates.

(b) (ii) The most commonly selected wrong answer was photosynthesis.

(b) (iii) and (iv) These were answered more confidently.

Question 3

(a) One mark was available for selecting the correct numbers, 600 and 3000, from the table to manipulate. A considerable number of candidates were unable to get this far. Of those that did, approximately half went on to give the correct answer 20% or its equivalent in any format. Not unexpectedly, there was a wide range of different calculations, with 2400 being the most common and 5 also being frequent. There was evidence that some candidates had not brought calculators with them to the examination.

(b) (i) Most candidates were able to explain why more water is lost from the skin on a hot day than on a cold day, framing their responses either in terms of sweat or cooling, or both. A few weaker candidates were confused between respiration and perspiration whilst others added information about urine concentrations and volumes, which was not always correct but was irrelevant in this part of the question and so ignored by the examiners.

(b) (ii) The great majority of candidates selected at least one correct answer in this part, with a little under half ticking the two correct answers. Once more, the need for candidates to read instructions carefully was evident, with a significant minority ticking only one answer. Although the examiners will treat any positive indication of an answer as equivalent to a tick, candidates should be encouraged to use only ticks, where requested, as some gave a series of ticks and crosses which were not easy to interpret.

(c) (i) The site of urea production was not well known, with kidney being the most common incorrect response.

(c) (ii) The response, stomach, was not uncommon.

(c) (iii) Most candidates knew that urine is stored in the bladder.

Question 4

(a) (i) The first and third pyramids were most commonly selected. Perhaps the relative avoidance of the second pyramid shows some measure of examination technique, as the pyramid which shows most efficiency is likely to be one extreme or the other.

(a) (ii) The reasons for wrongly selecting the third pyramid became evident in this part, with a wide variety of misunderstandings and misconceptions as to what a pyramid of biomass shows. It was by no means uncommon for these explanations to include ideas about humans needing three meals a day, represented by the three blocks underneath, that the three blocks have more food in them or that the three blocks below humans show more choice of food. Candidates clearly were not aware that the pyramid is a representation of a food chain, with the organisms at each tier feeding only on the one tier immediately below. Those explanations which matched the first pyramid often only went as far as to suggest that it shows more food for humans, rather than more biomass or more energy.

(b) (i) Most candidates identified at least one way in which keeping pigs indoors may be more profitable than keeping them outdoors, with many covering all possibilities by going on to give all four ways, often writing well beyond the available space. Some candidates were confused about the heat portion of the pie charts, suggesting that farmers would need to *supply* more heat to pigs kept outdoors. As the information was about energy and the question directed candidates to use information from the pie charts, ideas about needing to buy less land and cleaning up less mess did not gain credit here.

(b) (ii) Many statements made by candidates were considered too vague to gain a mark. Examples of these were more natural, being nice to pigs, keeping happy pigs and pigs having a better life. Some candidates made creditworthy responses about better quality meat, but others incorrectly thought that the meat would be fresher, cleaner or healthier. Candidates often used terms such as organic or free range without apparently understanding what they meant. Unqualified, these were insufficient to gain this mark. Several candidates considered it would be better to keep the pigs outdoors for ethnic reasons! However, there were also many good answers referring to cruelty, which was accepted in all its various spellings.

Question 5

(a) A good number of candidates labelled the diagram correctly.

(b) In this part, it was evident that very few candidates knew that the daughter cells produced by mitosis have the same chromosomes as the parent cell, as a wide range of strange responses were given. Some candidates apparently had been taught about meiosis, which is not expected for Foundation Tier, and drew just one of each chromosome pair, others drew chromosomes in various stages of mitosis, commonly anaphase, whilst many drew twenty or thirty short lines, often in parallel rows. Single blobs were also common, perhaps representing a nucleus within the outline of a cell.

(c) In contrast this part was done well by the majority of candidates, many of whom will have scored all four marks. Once more, however, it was evident that a minority of candidates do not read the question carefully enough as scripts showed double-headed arrows indicating the responses for parts (c)(i) and (ii) should be reversed. Clearly showing that the request for advantages in part (c)(i) had been misread as disadvantages and that not until part (c)(ii) had been attempted had the difference become evident. So, had only part (c)(i) been asked, many candidates would, unnecessarily, have got this wrong.

Question 6

(a) (i) This part demanded several skills from candidates, selecting the data for males, selecting the bars for the correct age groups, reading the scales to get the correct values and then subtracting the values. Hence it was good to note that nearly half of the candidates were able to get over all these hurdles. Those who arrived at the correct values almost always completed the calculation correctly.

(a) (ii) Candidates were required to describe. Inevitably there were those who chose to explain. Even so, these often picked up at least one of the marks as explanations included descriptions. Some candidates, also not reading the question well enough, carefully described the differences, often in good detail, between males and females and only rarely acquired a mark.

(b) (i) Good knowledge of protein digestion was shown here, with almost three quarters of candidates correctly identifying the stomach as the site of digestion of orally administered insulin.

(b) (ii) Sensible references to dietary changes were accepted. Unqualified references to increased protein intake were considered to be insufficient. Salt reduction was confused with sugar reduction by some candidates. The diabetics would have had their condition worsened by the many candidates who knew that sugar was involved, but wanted to increase their sugar intake by feeding them extra sweets and chocolate bars.

Question 7

(a) (i) Many candidates knew the correct word equation here. Indeed more candidates identified oxygen as a product of photosynthesis, here, than were able to circle the correct answer in question 2(b)(iv). The most common error was to reverse the responses, although chlorophyll, energy, sugar and more surprisingly carbon dioxide and water were not uncommon. Credit was given, where appropriate, to those candidates who chose to use chemical symbols, even if they did not match standard conventions of upper and lower case letters and subscripts.

(a) (ii) Only just under a half of candidates were able to answer this part correctly.

(b) This part was expected to be fairly straightforward, considering the emphasis which is put on describing variables in practical work and ISA assessments. Candidates should be aware that they cannot simply ignore this component in their revision and that written papers will inevitably contain some elements from their practical experiences. It was common for candidates to describe all manner of control variables described in the information, whilst others believed the card, or its size, colour and position to be independent variables. References to chlorophyll were very rare, those gaining this mark often referring to green and white areas of the leaf. Those referring to light often appeared to gain the mark fortuitously, as their other answer was often warm, suggesting the candidate was giving two control variables.

(c) Despite the difficulty in identifying independent variables, candidates met with more success here. Had many of them been more aware of the link between the dependent variable and independent variables they might have reconsidered their answers to part (b).

In both parts of (c) it was not uncommon for candidates to offer two or more suggestions, such as no light or carbon dioxide for part (c)(i). Candidates are advised that, when unsure, they should choose just one answer from their thoughts to write down, as incorrect answers negate correct ones. Many candidates gave the impression they had never seen variegated leaves, suggesting that the white portions are dead or contain no cells or that it was starch which made them white, somewhat contradicting the information.

(c) (i) Answers often referred to the leaf's lack of light, either directly, or in terms of the card absorbing it.

(c) (ii) Fewer candidates referred to chlorophyll, or its equivalent.

Question 8

(a) (i) Many candidates correctly identified the increase in rate of decay at the higher temperature. Many of these, unnecessarily, attempted to explain this in terms of reaction rate. The added detail, for the second mark, sometimes indicated that the candidate had selected the wrong oxygen concentration, commonly the 30% value, or showed misreading of the scale, choosing 25 and 60 as the values, rather than 30 and 60. Other candidates taking the wrong tack, attempted to describe the effect of changing oxygen concentration on the rate of decay, though many of these still gained one mark, by including relevant references to temperature.

(a) (ii) In this part it was hoped that candidates would use the clues in the previous part to give an explanation for the holes in the side of the compost bin. A good number of candidates accepted this cue and referred to the entry of oxygen, or air. Many included a wide variety of other substances, including carbon dioxide, light and microorganisms. Fortunately for these candidates, the examiners ignored additional suggestions. The examiners also considered that the entry of water through the holes in the side of the bin would be insignificant compared with that getting in through the open top and did not credit this suggestion. However, those few who referred to the holes letting heat escape were rewarded, although none could explain why this would be important. Again, the second

mark was less commonly awarded. Many candidates being unable to explain the advantage of oxygen being able to access the contents of the bin, either in terms of microorganisms themselves or their respiration.

(b) In this part many candidates referred to nutrients or minerals, although some negated this by including incorrect references to sugar, vitamins or proteins. The examiners considered that any additional carbon dioxide liberated by the continuing action of microorganisms on compost would have such insignificant impact, that it was ignored. References to food and goodness were also considered to be far too vague to be worthy of credit, without qualification.

Mark Ranges and Award of Grades

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