

Examiners' Report/
Principal Examiner Feedback

January 2012

International GCSE Biology (4BI0)
Paper 2B

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Question 1

It was pleasing to note that the comprehension allowed all candidates' access to the paper, including those new to the specification.

Most did well with (a), fully appreciating that snail meat is low in fat and high in protein. In (b), the better candidates realised that snail farming helps to conserve the natural snail populations by reducing their collection. Weaker candidates tended to repeat the text in the passage and did not show any signs of real comprehension. Most appreciated that the spider was the organism used in biological control on snail farms and most appreciated that an (exo) skeleton needs calcium or phosphate. Many gave a list of mineral ions but were credited if calcium and/or phosphate were in the list. In (e)(i), many understood that difficulty with digestion was an issue, but only the best gave a full answer by naming cellulose as the molecule that could not be digested because the organisms lacked the enzyme cellulase. Many candidates merely repeated text from the passage defining the term AE, thus showing little understanding. Credit was also given if candidates appreciated that cellulose could not be absorbed or that there was a lack of symbiotic organisms. Part (f) posed difficulty for many candidates who, though able to comprehend that the metabolism of birds and mammals is greater, failed to suggest why by making reference to their need to maintain body temperature or that they are likely to be more active. Answers defining the term 'selective breeding' tended to lack any reference to human involvement and many answers could equally be true of natural selection and, as such, gained no credit. The term 'sterilised' posed difficulty for weaker candidates who failed to appreciate the need to prevent microorganisms causing harm to the snail eggs.

Question 2

This question tested understanding of the cloning process. Despite its apparent simplicity, the question discriminated very well. The most common error was naming meiosis as the cell division, rather than mitosis. Candidates are advised to use technical terms correctly, so only the term 'surrogate' was accepted in the final sentence.

Question 3

This question tested candidates on their understanding of a novel investigation and explored understanding of data analysis. The correct average in (a) should have been calculated by adding up all the values except any anomalous result and dividing by the number of these values. The result for student 9 was anomalous, so the total of 16 should have been divided by 9, not 10. The best candidates were aware of this. Wrong answers could still gain one mark if the examiners saw the number 16 in the working, showing correct addition of the values. Most gave at least one acceptable response in (b). Candidates who simply stated that sweat production differs in different people were not credited unless they gave a valid explanation. Part (c) revealed that weaker candidates are unaware of the correct way to calculate a percentage increase. In (d) (i), most candidates appreciated that sweat production increases in hot air in an attempt to cool the body. Part (d) (ii) was more challenging with only the best candidates appreciating that there is less evaporation in humid air, which leads to less heat loss and the response to sweat more in an attempt to

cool the body. There was much confusion between the terms sweating and evaporation.

Question 4

The term 'hypothesis' seemed unfamiliar to many candidates and, as such, their attempts to construct a sentence that explained the observations made in this investigation were disappointing. The examiners were looking for answers that showed an understanding that light intensity affected the level of carbon dioxide in the tubes. Candidates who repeated the information describing the investigation or only made reference to the colour changes gained no credit. In (b), credit was given for temperature, species of plant and volume of indicator solution. Most candidates were able to gain at least one mark showing that they have a good understanding of controlled variables. Equally pleasing were answers to (c). Candidates appreciated the role of a control to allow a valid comparison to be made between tubes A, B and C. Part (d) expected students to offer explanations for the colours seen in the tubes. The better candidates appreciated the roles of photosynthesis and respiration and how the net change in carbon dioxide is affected by light intensity. Weaker candidates described the colour changes or made reference to oxygen gas. Only the best candidates appreciated that limewater can only show an increase in carbon dioxide and, unlike hydrogencarbonate indicator, cannot show a decrease in carbon dioxide.

Question 5

Most candidates coped well with having to draw the food chain, though a surprising number included organisms not mentioned in the question. An equally surprising number failed to put the arrows in the correct direction. In (b)(i), most were able to appreciate that a hawk had more success with a smaller number of pigeons in a group, but only the better candidates went on to give a sensible explanation. Part (b) (ii) examined student knowledge of the eye and a pleasing number of candidates appreciated the role of the ciliary muscle, the suspensory ligaments and the lens in helping to focus on an approaching hawk. Considerable confusion existed about the contraction / relaxation, tightening / slackening and fattening / thinning of these eye parts. The role of circular and radial muscles was not credited. Most candidates were able to describe what happens to protein in the stomach and it was common to award full marks for this part of the question.

Question 6

Part (a) of this question tested candidates' understanding of a simple genetic cross. Most chose a sensible upper and lower case letter to represent the parental genotype but a surprising number chose different letters. In these cases, no mark was given to the parental genotype but the concept of transferred error was used to credit the gamete and offspring genotypes. In (b)(i), a pleasing number appreciated the need to keep the plants isolated, particularly from agents of cross-pollination such as insects. Many suggested that Mendel himself transferred pollen from the anther to the stigma of the same flower using a brush and due credit was given. Credit was also given to those candidates who described self-pollination. In (b)(ii), no credit was given for combinations of different letters such as T and D or T and d or T and S. Defining genetic terms is a challenge for students but many appreciated that a

dominant allele is the one expressed in the heterozygote and that codominant alleles are both expressed in the heterozygote.

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