



**General Certificate of Secondary Education**

**Additional Applied Science 4863**

**AASC/2H Science at Work**

**Report on the Examination**

*2010 examination – January series*

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## General comments

It was noted on this paper that high ability candidates were able to score well on the biological question on the paper (question four) but were considerably weaker on the chemistry questions in the forensic science section (questions three and six). This was surprising as many candidates do a forensic science investigation for unit three and cover the types of questions that were on this paper.

A substantial number of candidates continue to show confusion with nomenclature eg on question two: strong / hard / hard wearing; and on question four: glucose / glycogen / glucagon, where the basic principles of the answer are known, but the candidate is being let down by the necessity to be precise with the words they use.

## Question 1

This question was tackled with enthusiasm by most of the candidates.

- (a) (i) The four bars were plotted correctly in most cases, although too many lost an unnecessary point because of badly drawn lines exceeding the tolerance for accuracy. The use of a ruler was conspicuous by its absence.
- The most common loss of the third mark was the lack of a coherent base line for the scale eg the first number on the scale would be 2 at the 2 cm mark, with a subsequent scale of 1 million: 2 cm, but this means that the base line is 1 not zero. If this was not identified correctly, the scale did not gain a mark, even if the four numbers were plotted correctly according to the remainder of the scale.
- (a) (ii) This question was answered well, with only occasionally the mark being lost for saying that it was higher in 2007, and failing to identify a consistent upward trend.
- (a) (iii) Only a third of candidates gained the mark for this question. Candidates failed to answer more people were involved and often said more farmers were involved.
- (b) (ii/iii) Candidates demonstrated a wide awareness of the principles of organic farming. A third of candidates were able to gain both marks with the most frequent answer being roam free/more space for both questions.

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**Question 2**

- (a) (i) Rubber and leather were the most common correct answers. Some candidates lost the mark by giving plastic or a named unsuitable synthetic for their answer.
- (a) (ii) The majority of candidates were able to answer this part correctly.
- (b) (i/ii) Light/lightweight was the most common correct answer for part (b) (i) and ‘will not corrode’ was often given correctly for both part (b) (i) and (b) (ii). However, an unfortunately high number of candidates were to forfeit marks in each of these questions by making lists of answers, eg ‘strong and hard’, the wrong answer cancelling the right one.
- (c) Only a fifth of candidates gained one mark for this question.
- (d) ‘Lightweight’ gained one mark for most candidates, but the second mark was lost frequently because of references not directly related to the material, such as comfort, better fit etc.

**Question 3**

- (a) (i) A third of candidates gained a mark on this question.
- (a) (ii) Most candidates who attempted this question were unable to provide a suitable enough answer to gain a mark.
- (a) (iii) This question was poorly answered with only a small percentage of candidates gaining a mark. Almost a third of candidates did not attempt this question.
- (a) (iv) Only a few candidates were able to state a positive result of the test.
- (b) Only a small proportion of candidates knew the formula for calcium carbonate.
- (c) (i) Rather surprisingly the most obvious answer of solubility was almost equalled by the alternative answer ‘not calcium carbonate’. ‘Not a carbonate’ was not sufficient for a mark.
- (c) (ii) If, after ‘universal indicator’ was given for the first point, a specific colour change was given as the second point, instead of referring to using a colour scale, the colours had to be correct; the blue/red colours for litmus were not enough. The correct use of a pH meter as an answer was rare.
- (c) (iii) About half of the candidates were able to identify the solution as acidic to gain a mark.
- (d) Question unattempted and zero marks were rare, answers were often clear and confidently set out. The most unnecessary loss of marks was for using paper to mount the tape instead of card. Quite a number of candidates who chose photography as their method, forgot to illuminate prints or scan the photographs into a computer when that method was used, resulting in some gaining only one mark.

#### Question 4

- (a) (i) Increase in heart rate and increase in breathing rate were the two main answers. The main loss of marks here was where the candidate explained the mechanism of oxygen debt rather than focusing on physical changes in the body.
- (a) (ii) About a third of candidates were able to gain a mark for this question.
- (a) (iii) Most candidates were unable to name the process as anaerobic respiration.
- (b) The unfortunate reaction of many of the candidates to the word 'hormone' in the question, was to fail to identify insulin, or glucagon as a hormone. In the worst cases, this mistake stimulated answers about mood swings, temperature control etc, and failed to connect at all with the control of blood glucose. For those who avoided this pitfall, and who were trying to put down a coherent progression through the steps in blood glucose control, spelling was a problem. Whilst there is a certain elasticity in marking the spelling of words like 'insulin' and 'pancreas', there can be none for the words glucose, glycogen and glucagon, as they are too similar, and there were many instances of candidates giving the impression of having understood the question but gaining few marks due to the miss-spelling of the crucial words. Just over half of the candidates scored zero marks.
- (c) 'Energy is released slowly' was the generally successful answer for the first mark, but a second correct answer was rarer. 'Carbohydrates increase energy/give lots of energy' was not enough for a mark unless the idea of its increasing energy stores was there too.

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**Question 5**

This was the first question which tested the candidates' ability to interpret and comment on the available facts.

- (a) This question needed only a straightforward factual response, and was answered well. Shelf-life / sell by date was the most popular response, with the only regular mistake here being a number of candidates who put down shelf life, sell by date and consume by date as their three answers, but received only one mark. Almost a third of candidates gained full marks.
- (b) (i) Many candidates gained the 'allergic reaction' mark, but too often gave, as in 5(a), two similar answers, the most popular being 'causes allergies, causes hyperactivity' which gained only one mark. For those who attempted to explain why people had a right to know these facts, some lost the mark by saying they had a right to know what additives are in the drink, but that is not the same as a right to know what reactions the additives may cause, and such answers were not awarded a mark.
- (b) (ii) A substantial number of candidates gained a mark for 'would reduce sales', (or the reverse 'So that people will continue to buy the product' if expressed correctly), and a reduced number gained the second mark for 'making the drink look less healthy' or 'damage company reputation'. The first and last possible answers were very rare.
- (c) (i) One mark for this question was more frequent than two. Many chose 'to make haemoglobin' but failed to extrapolate the answer into one of the other two mark points.
- (c) (ii) About a fifth of candidates were able to identify vitamin C as the vitamin that is important for the absorption of iron into the body.

**Question 6**

- (a) Like question 4 (b), this question was often misread, and the answer that was given was about testing the samples (do a flame test etc.) rather than answering the question which was clearly about sampling, which resulted in a high proportion of zero marks. However those candidates who correctly read the question often gained both marks, but such answers were few and far between.
- (b) (i) About a third of candidates were able to answer this question correctly.
- (b) (ii) Not many candidates gained a mark on this question. A substantial number of candidates failed to attempt this question.
- (c) Just over a third of candidates gained at least one of the two marks allocated. The answers were spread fairly evenly over the options, except for 'crystalline' which was rare. It was well done for a higher level answer.

### Question 7

- (a) Just over a third of candidates scored two marks on this question, as candidates failed to realise that it was the difference between the two figures which was needed for the calculation. Even then, many candidates were unable to write a credible formula for a percentage which would have gained at least one mark even if the final answer was incorrect, so the award was often either two or zero.
- (b) This question was predictably poorly attempted, as it was another of the questions needing a certain amount of interpretation. 'Invasion of privacy' was the most successful answer, where attempted, with 'Results being used for other purposes' or a similar suitable statement, being an occasional alternative. This question certainly did succeed in testing for the best candidates.

### Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the [Results statistics](#) page of the AQA Website.