



General Certificate of Secondary Education

Additional Applied Science 4863

AASC/2H Science at Work

Report on the Examination

2009 examination – June series

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Dr Michael Cresswell Director General.

General comments

There were a very limited number of blank answer spaces and candidates generally answered questions in detail, although the information was not always relevant. The ability to use the correct scientific term to explain a function often made the difference between a partly successful and completely successful answer. For example, a candidate might use the word 'contract' correctly to describe the action of the diaphragm during inhalation, question 3(b), but then go on to say 'it moves up'; or in question 6(b), knowing that a solution of some sort was added to the food to elicit a colour change, but failing to remember the correct reagent.

Questions 5(c) and 6(b) were the most challenging.

Question 1

- (a) (i) It was good to see a positive response to a numerical question, so early in the paper. Just over one third of candidates achieved full marks and, with a higher proportion showing their working, some who gave the wrong answer still managed one mark for setting out the correct equation.
- (a) (ii) This question was generally well done, with few candidates gaining no marks and many both marks. There had to be a comparison, needing to show that the two fat contents had been evaluated, not just 'Rice Crisps have 24g of fat'.
- (b) (i) Similarly here, candidates needed to show that both sets of figures had been consulted to conclude that fat or saturated fat or sodium were more than the BHF Guide, not just that there was fat etc. in the Rice Crisps. Answers about sugar were wrong and salt did not appear in both tables.
- (b) (ii) There was a good understanding of the danger of these food groups but a few marks that were lost were for over-generalisation for example, 'heart problem'. The most common mistake was confusing salt with high cholesterol.
- (b) (iii) This question was poorly understood. 'Prevents constipation' was the most common correct answer, but too often the second mark was lost with responses that were too vague to gain marks e.g. 'aids digestion', 'helps you go to the toilet', 'helps remove waste'.

Question 2

- (a) (i) Most candidates understood the term 'scale' and completed the question successfully.
- (a) (ii) This question was done well, with the majority of candidates gaining at least two marks. The two most common successful answers were 'Pour (the plaster) into the mould' and 'Allow to set'. The third mark was often for making the support, as the 'Mix the plaster (of Paris)' did not gain a mark unless it was clear that it was mixed with water.
- (a) (iii) Many candidates chose to talk about the shoe, not the sole of the shoe. The answer had to refer clearly to what permanent marking could be found on the sole of the shoe, not material adhering to it or the detail of the shoe itself.

- (b) The problem with this part for some candidates was that they tried to create a database with the cast, when in fact the record (photograph, scan) of the cast should be compared with an existing database of shoe prints. One of the two marks was generally gained.

Question 3

- (a) (i) This part had a surprising number of erroneous answers. 'How much air taken in in one breath' was expected, but this was often confused with breaths per minute or total capacity. References to oxygen were incorrect.
- (a) (ii) This question was generally well answered.
- (a) (iii) The majority of candidates completed this calculation incorrectly.
- (a) (iv) Most candidates gained at least two marks for this part, with 'oxygen and to the muscles' being the two most common successful answers. Too many candidates wasted time explaining heart function and a number of candidates failed to gain the 'more energy' mark, by talking about energy or glucose being provided rather than used.
- (b) Some candidates lost marks here, because, although they understood that it was the movement of ribs, chest or diaphragm which controlled inhalation, they often used contradictory descriptions for the various movements such as diaphragm 'relaxing' and ribs 'getting bigger', which meant that they failed to be awarded the marks.
- (c) (i) Under half the candidates knew that the pancreas secreted insulin.
- (c) (ii) In this part, confusion reigned throughout the description for the function of insulin and full marks for a clear description were very rare. When two marks were awarded, it was generally for 'when glucose levels rise' and 'glucose is converted to glycogen'.

Question 4

- (a) This part was attempted with varying success, but generally one or two marks were gained. The main loss was where candidates gave a number of descriptions as to where the contamination would come from (e.g. food trapped, picking up bacteria from surfaces etc) but failed to follow up the description of the source with an explanation of the outcome providing a food source, spreading bacteria, etc). The most succinct answers were from candidates who identified moisture and warmth as conditions that allow bacteria to multiply.
- (b) Candidates struggled to make themselves understood, because many were not familiar with the terms swab, agar gel, Petri dish etc, which would have made their explanations of an obviously familiar technique much easier. Despite this difficulty, one third of candidates gained full marks.
- (c) Disinfectant, sterilisation and using disposable cloths were the most common answers for this part.

Question 5

The main loss of marks in this question came, not from lack of knowledge, but inattention to the actual content of the question.

- (a) (i) This part was well done, with many candidates gaining both marks.
- (a) (ii) The only mark regularly gained here was for compare or match, with few candidates actually collecting a sample of soil and many talking about matching the shoe not the soil.
- (b) The same comment can be made equally of this part, where again soil was ignored and the shoe or the shoeprint were discussed.
- (c) This was one of the two questions which demonstrated a considerable lack of knowledge on the part of most of the candidates. Many tried valiantly to express themselves while lacking the correct phraseology such as logical order, deductions based on facts etc. and did not always succeed with explanations couched in their everyday language.

Question 6

- (a) The two questions about diet in 6(a) proved a good example of why both parts of a question should be read before attempting to answer it. A number of candidates began by answering part (a)(i) about weightlifters, then getting to part (a)(ii) and realising their mistake. Some rectified the error acceptably, whilst others used an unacceptable double headed arrow without any explanation to reverse their answers. The correct diet had to be identified, if the reason was to gain a mark. All these various factors meant that this first part of the question had a rather disappointing outcome, where better marks might have been expected.
- (b) Along with question 5(c), this question proved to be the most challenging part of the paper. A test with some sort of reagent and a colour change as an outcome was understood, but a clear answer gaining all three marks was rare. The correct colour, purple (but not a variation of this e.g. blue/purple) was often the only mark gained.
- (c) (i) Candidates almost always attempted this part successfully, with the most common loss of marks being 1.7×2 rather than 1.7^2 as the denominator.
- (c) (ii) This part was answered much better this year, with both marks gained. Where only one answer was successful, it was generally 'muscle weighs more than fat'.

Mark Ranges and Award of Grades

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