



General Certificate of Secondary Education

Applied Science 4863

AASC/2F Science at Work

Report on the Examination

2009 examination – January series

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General comments

The majority of candidates attempted all parts of each questions. It was disappointing to note that candidates had a poor grasp of practical procedures and many were unable to describe a pH or a flame test or understand the different types of chemical tests used by a forensic scientist. Calculations in general were performed well with candidates remembering to use units.

Question 1 (low demand)

In the first part the majority of candidates picked out the bacteria present or the word 'live' but a large number of candidates were referring to the yoghurt being refrigerated. Most recognised that units were required in (a)(iv), but a surprising number just copied the information from the label and failed to do the simple calculation.

In part (b) not many candidates could relate back to the text that the yoghurt would be acidic because of the lactic acid content. Surprisingly, the method of finding the pH of a substance was only known by 20% of the candidates. The mark scheme was relaxed to allow any sort of indicator as only the best candidates used universal indicator. Litmus is **not** a suitable indicator as the litmus test only tells if something is acid or alkali and will not give the full pH range.

Question 2 (low demand)

This question was generally well done, but too many responses referred to the 'water bottle', which does not indicate physical activity being carried out. Many candidates were recording the pulse rather than the 'breathing in' part (e). One mark was still available for recording within a time frame.

Question 3 (low demand)

In part (b), candidates did not seem to realise that the marks on the bullet are made as the bullet leaves the gun, so it is not possible for other people to have the same type of bullets.

The majority thought that red blood cells have nuclei in part (c). A few candidates believed that people in the same family have the same DNA, but just over half recognised that everybody's DNA is different (apart from identical twins).

Question 4 (low demand)

Most candidates knew that a sports drink contained glucose and water, but many thought it also contained caffeine.

A variety of plans were chosen in part (b) with the majority choosing the correct answer. The majority of candidates recognised that the runner would need extra carbohydrates.

In part (c) candidates should be reminded to relate the material to the application. Leather and polystyrene would not be suitable for a running shirt. Candidates should be reminded to use the name of the fibre, not its trade name. Nylon and polyester are good examples to teach.

A variety of answers were given for the advantages of synthetic materials; lighter and comfortable were the most commonly correct answers. Lots of answers were still referring to cost, which is not acceptable. Candidates were confused about these materials absorbing sweat. The point about synthetic materials is that they do not absorb sweat unlike natural materials; they let the sweat out and hence dry quickly.

Question 5 (standard demand)

Many candidates knew how to reduce the salt in their diet by putting less salt on their food or choosing low salt varieties. However, many candidates gave vague answers that were not creditworthy: for example, 'eat a healthy diet', 'eat more fruit and vegetables' or 'eat less pizza'. Some candidates also confused eating less salt with eating less fat and suggested exercising more. Many candidates knew that eating too much salt causes high blood pressure, but some are still confused with the effect of too much fat and sugar.

Very few candidates could describe an ionic compound in part (b). Some had the idea of positive and negative charges, but they failed to mention attraction or ions and so did not get the mark. The majority of candidates thought that salt melts at 40⁰C.

Question 6 (standard demand)

Even though the question was about precipitates only 4% could identify that a solid would be formed in part (a),

In part (b) very few candidates knew how to test for calcium carbonate. Most candidates had some idea about how to do a flame test, but lost marks through not being specific enough: for example, checking the colour of the substance rather than the flame, putting the substance into a flame and not specifying that it should be hot or blue. Not many candidates suggested that they had cleaned the wire first. Too many candidates' descriptions of how to set up the apparatus were not creditworthy. Eye protection was rarely mentioned.

In b(iv) candidates read the word reliable and immediately thought of repeats, but the question was actually asking for precautions needed. While repeating generally ensures reliable results, it would not make much difference in a flame test if the reagents were contaminated and a dirty wire was used. Some candidates were confusing the experiment with microbiology and were insisting on a sterile wire, which is not important in this test.

Mark Ranges and Award of Grades

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