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Additional Applied Science AASC/2H

Science at Work

Unit 2

Report on the Examination

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Additional Applied Science
Higher Tier AASC/2H

General comments

On the whole, the candidates appeared to have sound knowledge of the subject areas, but some failed to gain marks by not applying that knowledge appropriately to answer the questions posed. There were numerous examples where candidates had not read the question carefully and/or organised their ideas, and too often superficial answers were offered where detail was required. The lack of organisation in presenting answers was especially noted in the more lengthy calculations. Candidates also failed to match the substance of their answers to the number of marks available to particular questions.

Question 1 (Standard Demand)

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

(a) (i)/(ii) were correctly answered by the majority of candidates, the straightforward scales on the graph producing few incorrect responses.

(a) (iii) Here there was some confusion in the use of terms such as precise, accurate and reliable, with candidates offering synonyms for both answers. The most common response was 'accurate'. The main failing was selecting reasons that also applied to taking temperatures manually, eg 'records/stores the data', 'a graph can be produced' and 'can read the temperature to 0.1 degrees'.

(b) The vast majority of candidates were able to identify the correct diagram, but then they neglected to sufficiently relate that the diagram showed blood vessels 'after exercise' to the rest of their answers, which often could equally be describing the 'before' as the 'after', as in 'heat is lost from the skin'. Marks were not available for answers such as 'blood rises to the skin', and 'heat is lost (more) easily'. Some promising answers were spoiled by incorrectly linking the increased blood flow to an increase in sweating. It was pleasing, however, to find so many candidates correctly using the term 'dilate'.

(c) In completing the bar charts most candidates correctly drew the bar for 'water lost through breath' on race day higher than that for a normal day. Then too many made an inappropriate assumption that because the bars for 'water loss through breath' and 'water loss through sweat' were the same height for a normal day, they would end up at the same greater height on race day. A significant number of candidates failed to relate the increase in both 'water loss through breath' and 'water loss through sweat' to a corresponding reduction in 'water loss through urine'.

Question 2 (Standard Demand)

(a) Only one third of candidates were able to gain full marks which was disappointing considering that the tests described are commonly performed in the school laboratory. The two substances most commonly identified were 'potassium ions' and 'carbon dioxide', whilst common incongruous responses were 'glucose' and 'hydrogen', the tests for which should be well known.

(b) (i) Equally surprising was the very small number of candidates who could give the formula 'NaCl', whilst most seemingly attempting to produce a formula with 'S' or 'So' in it.

(b) (ii) There were many reasonable attempts at this question and most gained at least one of the two marks available. Marks were lost for reference to charged 'atoms' or 'molecules' rather than 'ions'. Some candidates lost the mark they may have gained by the response 'bonds' by then referring to 'double bonds'.

(b) (iii) Some managed to get a mark for 'strong bonds'. However, too many candidates failed to link the breaking of the bonds to the greater 'energy' required, merely restating that the change in state required 'a very high temperature', which the question tells them. Quite a common explanation for the high melting points was that 'ionic compounds contain metals'.

Question 3 (Standard Demand)

(a) (i) There were many correct answers, but a surprising number of both insufficient eg 'for the blood' / 'keep the blood healthy', and completely wrong responses eg 'helps blood clot' / 'helps the immune system' / 'helps strengthen bones'.

(a) (ii) This question elicited what appeared to be many 'wild' guesses. 'Vitamin K' was a common choice, but vitamins A, B, and D were also given as answers, as were 'zinc', 'phosphorus' and 'calcium', the last given even when question 3(a)(iii) was answered correctly.

(a) (iii) A much better answered question with mostly correct responses.

(b) (i) This calculation caused little difficulty for the majority of candidates.

(b) (ii) 'Red meat' was the most common correct response, some lost marks by just saying 'meat'. Whist some types of nuts have a high iron content, the unqualified answer 'nuts' was insufficient for credit.

(b) (iii) Too many candidates failed to read this question carefully, and although they correctly divided the daily requirement of calcium in mg by the calcium content in 100g of broccoli in mg, (1300mg / 100mg), they then, seemingly, assumed that their answer (13) would be in kilograms. The clue that the question would require more than this was in the 2 marks allocated for a correct answer. One mark could have been gained for the working, (100 x 13)/1000.

(b) (iv) This was well answered.

(c) Common errors here were in stating that fibre 'aids digestion / makes it easier to excrete / gets rid of toxins'. Most answers contained sufficient correct knowledge of the importance of fibre to gain at least 1 of the 2 marks available.

Question 4 (High Demand)

(a) (i) This question required a relatively simple answer, which the majority of candidates failed to supply. The terms 'dissolve' and 'solvent' were rarely used, and few responses contained a suitable named solvent. Some answers suggested the use of an acid, and others that the ink could be scraped off.

(a) (ii) Here again, candidates failed to appreciate what the question was asking for. References to just the 'outcome' of paper chromatography were common, whilst a fairly detailed description of the process was required to gain all 4 marks.

There were plenty of possible opportunities to gain marks, and most answers gained at least 1 or 2.

(a) (iii) This question asked for a method of revealing fingerprints, but many candidates also described how prints could be lifted. Many attempts gave too skeletal a method, eg use UV light, although the question asked for a description. Again candidates failed to take into account the number of marks shown for the question.

(a) (iv) Most candidates correctly expressed the idea that the suspect may have been given the note elsewhere. A relatively common mistake was to say that the suspect's prints got onto the note as it was handed to the shopkeeper.

(b) There were a good number of possible correct answers to this question, and most candidates were able to provide two. A few made the mistake of stating 'the driver's name / address'.

Question 5 (High Demand)

(a) (i) (a)(i) and (a)(ii) were generally well answered. The term 'microorganism' used in the stem of (a)(ii) prompted some candidates to answer 'bacteria'.

(a) (iii) This was very poorly answered. A few candidates could give the formula for glucose, but only very few could give both formulae.

(b) (i) Very well answered.

(b) (ii) Well answered with many answers gaining 2 and 3 marks.

(b) (iii) Many candidates were able to identify the possible scenarios.

Question 6 (High Demand)

(a) That muscle is denser than fat (candidates often said 'heavier') was well known and many candidates were able to relate this correctly to the question. A common mistake was to say that 'fat has turned into muscle'.

(b) There were few fully correct answers to this calculation, and most attempts were confused and very difficult to follow because the calculation was not set out step by step, with some explanation for each step, eg total energy used per 24 hours, not playing rugby = 1.3 x 97 x 24 = 3026.4 kcal. Only a few candidates used such an approach.

(c) (i) Well answered overall, with candidates mostly gaining marks for 'carbohydrates' and 'slow energy release'. 'Carbohydrates break down slowly' was insufficient for the mark as it does not refer to energy release.

(c) (ii) Some incorrect references to glucose 'breaking down quickly'.

(d) Well answered. The term 'antagonistic' was often used in the correct context, as were 'contracts' and 'relaxes', even if applied to the wrong muscles. Some answers incorrectly paired muscles from the upper and lower arm.

(e) Another area of Sports Science that candidates were able to score well in. The production of lactic acid and its effects on muscles were well known.

Mark Ranges and Award of Grades

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