



General Certificate of Education

Applied Science **8771/8773/8776/8779**

SC14 The Human Body

Report on the Examination

2009 examination - June series

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General Comments

As in previous papers, marks were gained by candidates demonstrating confident understanding of the underlying concepts of the specification and expressing this understanding using appropriate scientific terminology. Many candidates were able to do this well, but a significant number failed to gain marks either through re-iterating the stem of a question or by ignoring the stem altogether and writing generalised answers apparently triggered by recognition of just one or two words in the question. Candidates should also be aware that the mark scheme will not give credit for simple copying from the stem without any processing or application of information.

Candidates should take note of the “list rule” that applies when a number of responses are given to a question where only one response is required. In this instance the examiner is not able to select the correct answer from a list containing both correct and incorrect answers; nor is the first answer marked and the rest ignored. An incorrect response will cancel a correct one, so candidates should avoid writing several answers when only one is required.

Questions requiring the candidates to both describe and explain a point, usually to gain two, non-dependent marks, such as 1(b) were done rather better this year than last, but there were still many instances of candidates apparently expecting one-word answers to gain the full two marks.

Candidates seemed better prepared for the calculation questions this year, with far fewer leaving these completely blank and many setting out their working in such a way that, even if they did not arrive at the correct final answer, they were able to score at least one mark for the processing.

Question 1

This was the highest scoring question for many candidates. The food group and specific example were well known, although a few candidates failed to gain the example mark through the list rule. By writing, for example, “meat and vegetables” for the specific food, the mark awarded for the correct response “meat” is cancelled out by the incorrect “vegetables”.

In 1(a)(ii) less able candidates ignored the word “diet” in the question and wrote about increased exercise, or simply reiterated rote-learned material about healthy diets in general. Confusion about simple and complex carbohydrates still seems to exist. Better candidates realised that substitution of quick release/high GI carbohydrates by more fibrous, starchy foods would help to reduce weight, but less able candidates used the unspecified term carbohydrate and therefore often did not make their point clearly enough to gain the mark.

In 1(b), a significant number of candidates thought that a 12-year-old had finished growing and so gave incorrect responses. Others realised that increased protein would be important to the girl, but only explained it was needed for growth in general rather than the accelerated rate of growth that would be expected at that age.

Question 2

The majority of candidates knew that the hormone was ADH but a surprising number thought that it was produced by the pancreas rather than the pituitary. The increase in blood pressure as a result of ADH action was generally known well, although only the most able candidates linked the increased blood volume to increased cardiac output to gain the last of the four alternative marks.

Answers to 2(b) were generally weak, with many candidates obviously guessing and giving answers such as “dehydration”.

The calculation in part 2(c) was generally done well, with the majority of candidates gaining this mark.

2(e)(ii) was found to be difficult by many. About half of candidates realised that water reabsorbed at the large intestine should increase but very few were confident enough in their knowledge of homeostasis to recognise that if more water is being lost through the kidney, the resulting lower water potential of the blood would result in more being reabsorbed at the large intestine.

Question 3

BMR was known by most candidates, but relatively few could explain that it measured the minimum *energy* used by the body when at rest. Answers had to include mention of energy in order to be awarded this mark.

In 3(a)(ii) a common error was to state that eating *affects* BMR without saying whether the effect was to increase or decrease the measurement. In a number of cases the lack of communication skills of the candidate seemed to be preventing them from explaining their ideas unambiguously.

3(a)(iii) was done well by some centres but poorly by others. It did not seem to reflect the standard of the candidates but rather the experience in this area given them by their centre.

3(b) was done well in almost all cases, with many candidates realising that there was value in processing the data to show the effect of the training. The link between increased muscle mass and increased BMR was also well understood and well described.

Question 4

A significant number of candidates failed to gain marks here by not reading the stem of the question and writing rote-learned information on mechanical and chemical digestion rather than using the information given to discuss the effect that the woman’s cancer may have had on these processes.

In 4(b)(i) many candidates wrote about how the stomach prevented itself from developing ulcers by the secretion of mucus rather than protection against entry of bacteria by the secretion of hydrochloric acid, again suggesting that they had not read the question.

In 4(b)(ii) many candidates missed the point and wrote about the standard laboratory experiment to investigate the effectiveness of antibiotic on cultures of bacteria in petri dishes.

Question 5

The form in which oxygen is transported should have been given as oxyhaemoglobin but a disappointingly large number of candidates gave superficial answers such as “blood”. As before, careful reading of the question should help candidates avoid failing to gain easy marks. The rest of this question was generally well done.

In 5(b)(iii) only the highest scoring candidates made the link between respiration and the death of brain tissue if oxygen was unavailable .

Question 6

This question was done well by the majority of candidates, although an incorrect link between obesity and inevitable high plasma cholesterol levels was made by many. In 6(b) a number of candidates failed to gain marks because they knew the factors that needed to be taken into consideration but did no more than list them, without explaining that the diet, BMI etc of volunteers should be, as far as possible, the same.

The need for repeat measurements *with a calculated mean* was not well understood by many candidates in 6(c). The appreciation of the need for quantitative measurements, produced objectively rather than the subjective “dipstick” colour changes was also rare in these answers.

Question 7

Almost all candidates knew that calcium was the predominant mineral in bone, and the majority were able to perform the calculation correctly. In 7(c) there were many responses which implied that candidates still believed that the sun rains down vitamin D onto the people beneath. Other candidates fell foul of the list rule again, including fruit and vegetables with the dietary modification. It is worth noting that mushrooms are the only “plants” that contain significant amounts of vitamin D.

Although most candidates realised in 7(d) that the woman was taking more than her RDA of vitamin D, very few understood that this was a dangerously high amount and that it could prove toxic if not fatal. The inability of the body to excrete vitamin D was only rarely mentioned.

Question 8

The first two parts of this question were generally done well, and most candidates had some idea of the negative feedback mechanism by which the levels of thyroxine are controlled. There were however a large number of responses mentioning impulses being sent from receptors to the thyroid gland and little understanding about TSH being involved.

A good mark in this question, particularly in 8(c) usually indicated a very able candidate overall. As with other calculations 8(d)(i) was usually attempted and many candidates gained full marks, with others showing enough of their working to be credited with one mark.

Possibly because it was at the end of the paper and candidates were becoming tired, 8(d)(ii) generated some very inconsequential answers with little attention paid to the stem of the question. The need for regular monitoring of a drug that would profoundly affect all aspects of metabolism seemed to escape many candidates.

Mark Ranges and Award of Grades

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