



General Certificate of Education

Applied Science

8771/8773/8776/8779

SC14 The Healthy Body

Report on the Examination

2007 examination - January series

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General Comments

In this first examination of this unit it was clear that candidates on the whole were well prepared with most areas of the paper well answered. Most prepared candidates managed to gain credit across all areas of the whole paper. Candidates are advised to take more care in reading questions and follow the instructions carefully in order to gain full marks. Areas of strength were found in analysis of dietary compositions and explanations for improvements to the diet of different individuals i.e. candidates are good at spotting 'high fat/low salt' type answers. Knowledge and understanding of physiological processes e.g. of water balance, glucose homeostasis and cardio-respiratory regulation was weak. More care should be taken in preparing candidates in explaining these processes. Candidates should be encouraged to use scientific language in appropriate contexts.

Question 1

- (a) The majority of candidates were aware of the reasons for using disclosing tablets.
- (b) This was generally well answered across all candidates. No credit was given for simply stating that incisors 'bite' food.
- (c)(d) These were less well answered by weaker candidates who demonstrated little or no understanding of the basics of enzyme function. Enzyme function is clearly set out in the specification. Centres should ensure that candidates understand that since enzymes are not living organisms they cannot be 'killed'. There was also a common misconception that amylase was digested into starch, or that once amylase reached the stomach it was other enzymes which inactivated the amylase.

Question 2

- (a) This was a highly accessible question, with most candidates gaining credit in part (a) for identifying the important nutrients in the breakfast cereal which would be suitable for an older adult. In this instance, credit was given if candidates could provide a beneficial reason why a nutrient would be good for the man.
- (b)(c) The calculations in parts (b) and (c) were generally well handled. Credit was given in part (c) if the RDA was calculated using the values per 100g or per 35g.

Question 3

This question was again well answered. Credit was given for one health related outcome or improvement for each client. At times, candidates did not explore the information provided fully.

- (b) For example, for part (b) candidates often got stuck with the obvious notion that client E had a high fat diet, and consequent high cholesterol/heart disease health complications but did not identify that the diet was very high in protein and very low in carbohydrates. Centres should ensure that candidates are aware of recommended percentage energy intakes for each food group.

Question 4

- (a) The question demanded that candidates describe a simple glucose test. No credit was therefore given if candidates described the oral glucose tolerance test. No credit was given for stating the colour changes of dipstick tests. There is such a large variety of these available on the market that it would be impossible for the examiners to know the colour changes for each brand. Candidates should be guided to explain that colour changes are compared on a reference chart. Credit was given if candidates described a similar fingerprick blood test. It is pointed out to centres that Benedict's test is never used in a clinical setting and candidates should be directed away from giving answers describing this test. Credit will not be given.
- (b)(i)
(ii)(iii) These questions proved to be good discriminators. Many candidates clearly have very little understanding of glucose homeostasis. Common errors included only giving pancreas as the answer to part (i) and putting glucagon, or even starch as the storage form of glucose in the body.
- (c) Almost all candidates gained some credit for critically evaluating the experiment in part (i). For part (ii) credit was only given if the line for the normal curve returned to the starting level.
- (d) Another accessible question for candidates to gain credit in identification of a high sugar/high fat diet. No credit was given for mention of health related complications in this case as the diet was to be evaluated. In part (ii) better candidates clearly knew that these foods provide slow release energy source, but it was also clear that many candidates do not understand that this slow release energy is in fact glucose. This is a lack of understanding of basic science of food biochemistry. Only very good candidates were able to explain that this would prevent fluctuations in glucose levels. Weaker candidates would describe the man's diet as being sugary, but not recognise that glucose is a sugar and that complex carbohydrates provide glucose.

Question 5

Overall this question was a challenge for many candidates. Centres are reminded that a significant portion of the specification includes the basic biochemistry of cellular respiration and that candidates should be prepared to answer questions on this topic area.

- (a) An impressive number of candidates correctly provided the equation for aerobic respiration. (ii) No credit was given in part (ii) for stating leg tissue.
- (b)(c) These questions were good differentiators. Weaker candidates would generally not attempt these sections. Part (c) had many candidates suggesting glucose or energy drinks as other fuel sources which demonstrated they had not read the question correctly.

Question 6

This question was generally very poorly handled. Knowledge of even the basic physiology of respiratory function e.g. surface areas and diffusion, numbers of atoms of oxygen carried by haemoglobin was generally very poor across the candidature. There was also a misconception that carbon dioxide competes with oxygen for binding sites on haemoglobin. A small percentage of carbon dioxide is carried on haemoglobin, but it binds to other moieties of the protein. It should be made clear to candidates that the Bohr shift results in haemoglobin releasing oxygen at higher tissue oxygen partial pressures, hence the right shift of the oxygen dissociation curve. This is an attempt to provide enough oxygen for aerobic respiration.

(b)(iii) The line was often correctly drawn onto the graph but candidates were unable to explain why this was the case for part (iv). Explanations of the mechanism of responses to increased CO₂ levels were often incoherently expressed. These are contained within the specification as the homeostatic mechanisms for control of carbon dioxide in the blood. No credit was given if candidates discussed the action of buffers.

Question 7

- (a) Most candidates gained credit for basic discussion of the results of the experiment.
- (b) No credit was given for part (i) if candidates stated that group C would have high ADH levels because they had not consumed water. The important point is for candidates to recognise that controlling blood water levels is about controlling blood volume, with the consequent impact that has on blood pressure and electrolyte balance. Part (ii) proved challenging, with many candidates discussing where ADH is released from and then getting into a circular argument of ADH being released when water levels fall and ADH switching off when levels rise without mentioning the hormone's action at the level of the kidney or specifying the cells involved.
- (c) This question was poorly answered. Candidates were not given credit for stating nerve function and brain function as a pair of answers. Many candidates were clearly unaware of the specific function of sodium in the body.

Mark Ranges and Award of Grades

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