



General Certificate of Education

Applied Science

8771/8773/8776/8779

SC14 The Healthy Body

Report on the Examination

2007 examination - June series

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General Comments

Most prepared candidates managed to gain credit across most areas of the paper. Areas of strength were found in stating basic glucose tests, evaluation of dietary compositions and explanations for improvements to the diet of different individuals. Knowledge and understanding of physiological processes and general scientific principles e.g. of water balance, glucose homeostasis enzyme action was weak. More care should be taken in preparing candidates in explaining these processes and principles, as this is where candidates will gain credit. Candidates should be encouraged to use scientific language in appropriate contexts. In many instances candidates failed to gain credit because of vague responses to questions and not giving reasons or explanations e.g. a person should eat a healthy diet. What is healthy?

Question 1

This question was answered well with most candidates able to gain some credit for describing the use of diagnostic sticks for urine tests. Some candidates failed to gain credit because they wrote about glucose tolerance testing or blood tests.

The majority of candidates knew the range of normal glucose levels for (a)(i)

No credit was given for stating the colour changes of dipstick tests in part (ii). 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. No credit is given for description of Benedict's test.

For (b) common errors here were confusing glucagon with glycogen and stating glucagon was an energy store. Other common errors were confusing the functions of these hormones.

Question 2

This question was generally very poorly done. There is still misconception that carbon dioxide competes with oxygen for binding sites on haemoglobin. Most candidates knew a pulse oximeter is a non-invasive method for detection of blood oxygen saturation. Candidates should recognise that blood tests are invasive.

Most candidates were able to state for (b)(i) that her blood pH was more acidic.

For (b)(ii) no credit was given for stating that sodium bicarbonate neutralises blood.

Part (b)(iv) required an explanation of the regulatory mechanism of breathing rate.

Question 3

The basic recall of dietary requirements and consequences were well answered, but explanation of ADH regulation proved inaccessible to some candidates. Common errors were calculation of seven days worth of school meals rather than five days. Consequences of childhood obesity were well answered for part (c)(i). Psychosocial answers were rejected e.g. responses about being bullied, being depressed, being lazy.

Many candidates answered part (d) by incorrectly suggesting that sodium contributes to changes in blood pH, which suggests a confusion with the action of sodium bicarbonate.

Very few candidates gave coherent or accurate explanations of the mechanism of water homeostasis for part (e)(i), despite the direction of the question stating they should make reference to physiological processes.

Part (e)(ii) produced answers around avoiding dehydration which were rejected. Generally both parts of the question suffered from a lack of detail or reason for selection.

Question 4

Generally an accessible question, with most candidates able to answer most or all parts. No credit was given for stating oxygen as a nutrient. Nor was credit given for lists e.g. oxygen, glucose.

Question 5

Overall this question was a challenge for many candidates and was very poorly answered. Centres are reminded that the specification includes the basic understanding of how basal metabolic rate can be measured directly and indirectly and that candidates should be prepared to answer questions on this topic area. Many candidates did not attempt parts (a) or (b). A common error was describing direct calorimetry. It was also clear that many candidates confused BMR (basal metabolic rate) with BMI (body mass index), the latter of which is not mentioned on the specification.

Many candidates ignored the information in the stem of part (b) that both athletes had the same body mass, and gave the fact that the taller man had a greater body mass.

Parts (c) and (d) were where candidates gained most credit in this question, although most failed to gain marks for simply stating that men have greater mass than women, when they needed to state that the difference is down to greater muscle mass.

Question 6

It is clear that candidates understand some of the very basic principles of enzyme activity but cannot apply this to experimental design. A common misconception was that it was the pH level which should be monitored and not the enzyme activity and the evolution of product. There is also a common misconception that enzymes are living things which are killed, which may arise from using microbial experiments to explore enzyme activity.

Part (a) required candidates to joint points in a curve. Many failed to gain marks for inappropriate scales and origins not beginning at zero. Description of an experiment to explore effect of pH was also poorly handled. No credit was given by simply stating they would repeat the original experiment and change pH.

Question 7

Knowledge of the digestive system was tested in this question. Part (a) required candidates to explain how the normal stomach secretions protect the stomach and assist in digestion. Few candidates gave satisfactory answers becoming distracted by the presence of bile. Understanding of the function of bile was generally poor.

Part (c) was generally well answered with sensible suggestions for the dietary changes given.

Part (d) was largely well done, but for many was a lost opportunity. Credit was not given for vague answers such as 'healthy diet' or 'more fruit and vegetables'. Credit was given for one example and the reason for inclusion in the diet e.g. calcium for bone formation.

Mark Ranges and Award of Grades

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