



**General Certificate of Education (A-level) Applied  
January 2012**

**Applied Science**

**SC14**

**(Specification  
8771/8773/8776/8777/8779)**

**Unit 14: The Healthy Body**

***Report on the Examination***

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### **General Comments**

The pleasing trend of students' thorough responses with regard to insulin and glucagon continued this series. There was some confusion regarding glucose and glycogen by some, but on the whole, students made good use of scientific terminology.

QWC questions still pose a problem for a significant number of students who continue to mark inaccurate statements that lack A-level depth. AO3 questions were also poorly answered this series with many students unable to plan experiments in enough detail and with due regard to reliability.

### **Question 1**

- (a)(i) Students demonstrated a level of confusion in their knowledge of the pulse oximeter. By wrongly identifying the piece of equipment they were unable to gain the second mark for stating it was non-invasive.
- (a)(ii) Responses to this part of the question were pleasing, where many students correctly stated appropriate units for oxygen saturation levels.
- (a)(iii) There was much confusion between the terms 'molecule' and 'atoms'. A significant number of students wrongly stated that haemoglobin carries 8 oxygen molecules.
- (b) Lots of students demonstrated a sound understanding of diffusion pathways.
- (c)(i) The ranges were known by the majority of students.
- (c)(ii) This part of the question was answered variably and it was clear that for some schools and colleges, this area of the specification was poorly understood. Some students, however, had an excellent grasp of CO<sub>2</sub> and blood pH and were rewarded with full marks.
- (c)(iii) Most students were able to answer this with ease.

### **Question 2**

- (a)(i) This was answered badly by some students as there seemed to be confusion between softening of the bones and brittle bones.
- (a)(ii) Few students were able to answer with the correct level of vitamin D.
- (a)(iii) Students demonstrated a thorough knowledge of testing for vitamin D and this was very encouraging.
- (a)(iv) Students' ability to state which foods contain the most vitamin D was also encouraging.
- (a)(v) Unfortunately, some students stated sun rather than sunlight and this negated any marks.
- (b)(i) Answered well by a significant number of students. Calculations were accurately executed for this part of the question.
- (b)(ii) Calculations were well executed.

(b)(iii) Lack of growth was correctly stated in this part of the question.

### **Question 3**

(a)(i) Most students scored 1 mark for this part of the question but few scored 2, mainly due to incorrect identification of alpha and beta cells.

(a)(ii) This was answered correctly by most students.

(a)(iii) Students gave correct answers but also included long lists of wrong answers which negated the correct answer marks gained.

(b)(i) Lots of students stated that the graph fell but failed to state that the graph initially rose after drinking the glucose solution.

(b)(ii) Answers given to this part of the question were thorough and students clearly understood blood sugar control. Many were rewarded with full marks which was pleasing to see.

(b)(iii) This was the first of the QWC questions and many students failed to add the level of biological fact required to access the higher marks. Many answers lacked A-Level terminology and general statements were made particularly with regard to diet.

Other students confused carbohydrates with other food groups. On the whole, quality of written communication throughout the question was good. Of the two 5 mark questions, this was answered to a much higher standard.

### **Question 4**

(a)(i) Both this and (a)(ii) were answered poorly. Many students could not correctly draw a line of best fit and a number of students were unable to draw a correctly scaled axis. Most correctly plotted points but there were many scaling errors.

(a)(ii) In this part of the question, students failed to correctly interpret the graph. Many wrongly stated that the enzyme works best in neutral conditions or that it worked best in extreme acid and/or alkaline conditions.

(b)(i) For this part of the question, candidates' responses indicated a lack of understanding of practical manipulation and many failed to give answers pertaining to a range of temperatures.

(b)(ii) Some students failed to identify methods of improving reliability. However, some answers demonstrated precision and a depth of knowledge that was encouraging.

(c) For this part of the question, many candidates correctly stated that bile emulsifies fats but did not go on to say that it neutralises stomach acid. Some attempted to state this fact but wrongly stated that high pH is acidic and low is alkaline.

### **Question 5**

- (a) Some students were confused between when the diaphragm contracts and flattens and when it relaxes and domes to its original position. Many students did have a clear grasp of the breathing mechanism, however, and scored full marks.
- (b) The majority of students correctly identified the large intestine. Some incorrectly stated the small intestine while others wrongly linked water loss to the kidney.
- (c) This part of the question required the correct identification of ADH and a description of its action. Many students correctly identified the hormone and went on to accurately describe its action. Some students stated that water is reabsorbed but failed to describe changes in permeability of the collecting duct.
- (d)(i)(ii) This provoked mixed responses. Some students demonstrated a thorough knowledge of lungs and diffusion while others did not even attempt the question.
- (e)(i) On the whole, this and (e)(ii) were answered exceptionally well by most. Any students that didn't gain full marks gave vague answers that only stated that it was a long time between exposure and onset of cancer.
- (e)(ii) Some students didn't go on to state that this meant there could have been exposure to other subsequent carcinogens or risk factors.

### **Question 6**

- (a)(i) Generally this question was the most successfully answered and the level of understanding demonstrated by the majority of students was very encouraging. A significant number of students scored full marks. Disappointingly, the main reason why some students did not gain maximum marks was because they failed to give a range for this part of the question.
- (a)(ii) Generally well answered.
- (b) Generally well answered.

### **Question 7**

- (a) On the whole, this question was poorly answered and students demonstrated a lack of understanding of cellular respiration. A significant number failed to give a correct chemical equation, some opting to give a word equation instead.
- (b)(i) Many students listed all the stages of respiration, demonstrating a lack of knowledge of glycolysis.
- (b)(ii) Students gave a range of ATP molecules from 0 to 40, again demonstrating a lack of understanding.
- (c)(i) Students scored higher marks for this part of the question where they correctly defined BMR.
- (c)(ii) Students scored higher marks for this part of the question where they knew that males had more muscle than females.

- (c)(iii) In this part of the question calculations were weak and few gained 2 marks. Students either understood the question and gained all 2 marks or scored zero. Many did not attempt the question component at all.
- (d) The final QWC question was very poorly answered. Many students did not attempt it and those that did, on the whole, gave very superficial answers. A-level biological fact was absent and often confused, and this coupled with poor structure and spelling meant that the majority didn't access the higher mark levels for this question. It was clear that for some schools and colleges, this area of the specification was poorly understood. Nonetheless, some students had clearly learnt cellular respiration thoroughly and were rewarded with full marks.

### **Mark Ranges and Award of Grades**

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA website.