Version 1.0: 0707

ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Applied Science 4861

APSC/2H Science for the Needs of Society

Report on the Examination

2007 examination – June series

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General Comments

Although some of the candidates entered for the Higher tier paper would have been better advised to attempt the Foundation tier paper, the standard of responses on the first three intermediate-level questions was encouraging. The six high-demand questions proved to be more challenging, especially Question 9. The paper discriminated well between levels of ability and produced a wide range of marks overall.

Question 1

1(a) was an easy question, on which the majority scored a mark. Legs and brain were fairly common wrong answers.

Most candidates answered **1**(b)(i) well. Cell wall was the most common wrong answer. Most scored 1 mark in **1**(b)(ii) for describing the long shape of the cell. Relatively few scored the second mark for stating that the nerve cell has many connections or is insulated.

Question **1**(c) was well answered. Most candidates scored 1 mark for mentioning glucose. Many scored full marks because they knew the involvement of glucose and oxygen in respiration. Answers that only mentioned oxygen being carried to the muscle cells were not given any credit.

Although many correct answers to **1**(d)(ii) were seen, 'the hormone is carried in the nerves' was a fairly common wrong answer. Some candidates failed to answer **1**(d)(ii)this question. Insulin and the sex hormones were the most popular answers and the candidates that chose them often scored both marks.

Question 2

Many correct answers to **2**(a) were seen and the rotting of wood was the most popular answer. The flammability of wood was often given as a disadvantage of using wood but it was not given any credit. Some candidates think that wood is a poor insulator and that it is not a strong material.

Many candidates failed to score the mark for **2**(b)(i) because they focussed on the strength of the materials rather than the rigidity. Some completely missed the point and centred their response around corrosion and thermal conductivity. It was disappointing that so many candidates left **2**(b)(ii) blank when a simple definition of a composite was all that was required.

Although sodium carbonate was rarely seen as the answer to **2**(c), sand and limestone were common correct answers. Water, combined with sand, was a common wrong answer.

Although some very good answers were seen to **2**(d) some candidates scored only one of the two marks because they restricted their answer to a description of the better insulating properties of double glazing.

Question 3

Question **3**(a) was well answered. A good proportion of candidates knew how to calculate speed from distance/time.

The majority of candidates scored well on **3**(b) because the mark scheme enabled credit to be given for a variety of answers.

Question **3**(c) was an easy two marks. Driving lessons and breathalyser tests were the most common correct responses.

Question **3**(d) was very well answered. The vast majority of candidates could calculate speed from distance and time, even though some of them had failed to score the mark in **3**(a).

Although some candidates failed to respond to **3**(e), and there seemed to be some confusion with amplitude and wavelength, a good number knew that frequency increases as the car approaches and decreases as the car moves away.

Question 4

An easy mark could be gained in **4**(a), the majority of candidates correctly sequencing the planets based on surface temperature.

It was disappointing that so few candidates scored any marks for **4**(b). Hardly anyone knew the formula for ammonia.

Although some candidates tried to bring global warming, depletion of ozone or pollution into their answer for **4**(c), there were many good answers based on the effect of photosynthesis.

Most candidates scored 1 mark in **4**(d)(i) for either high concentration of carbon dioxide or high temperature but relatively few scored both marks. It is always the case that a 2 mark question requires two separate points to be made to score full marks. Many scored 2 marks on **4**(d)(ii), the unreliability of wind energy or solar energy being the most popular answers. A wide variety of answers was seen to **4**(d)(iii). Vague answers and those that did not directly answer the question did not score marks. For example, a number of candidates suggested using examples of renewable energy resources.

Question 5

Antibiotic was the only acceptable response to **5**(a) and approximately half the candidates chose it.

A relatively small number of fully correct answers to **5**(b) were seen. Vague answers about the body fighting the infection or the body knowing how to deal with the infection were not credited.

A range of answers to **5**(c) enabled a good number of candidates to score marks but it was surprising how many repeated vaccination as a method and therefore scored nothing.
There were few good answers describing the use of X-rays in **5**(d): almost as many candidates suggested the use of gamma rays.

Although many scored marks in **5**(e) for matching the wide range of answers in the mark scheme, it was disappointing to see a significant number of candidates leave this question blank.

Question 6

Question **6**(a) was disappointing in that so few correct answers were seen. High melting temperature was the expected answer but many other properties were given; some were incorrect and some were correct properties of ceramic materials but none of them were relevant to the use in this example.

For **6**(b)(i) approximately half of the candidates scored the mark. It was surprising to see how many of the rest failed to include lead as a product of the reaction or left the answer blank. It was encouraging to see a good number of fully correct equations in **6**(b)(ii) but more candidates left this blank than **6**(b)(i) and there were quite a number of incorrect symbols for lead. Candidates are expected to know the symbols and formulae listed in the Appendix D of the specification. The meaning of the term 'reduction' was not well known (**6**(b)(iii)). Some candidates scored the mark by describing what was happening in the chemical equation.

Lead piping was a much more popular answer to **6**(c)(i) than roofing, perhaps because those candidates were drawing from their everyday knowledge of the world outside the classroom rather than what they have been taught. There is still considerable confusion about the material used in pencils. Waterproof, flexible and corrosion resistant were popular correct answers to **6**(c)(ii) but in questions like this candidates should be informed that vague terms like 'strong' will not be given any credit.

Surprisingly few correct answers to **6**(d)(i) were seen. Many candidates correctly read 62% from the graph but there were no marks for this first step. In **6**(d)(ii), although a good number of candidates could obtain the percentage composition of tin in the solder from the graph, relatively few went on to calculate the masses involved.

Question 7

A pleasing number of candidates knew the relationship between current, power and volts and were able to score full marks on **7**(a).

Relatively few students selected a 12 or 13 amp fuse in **7**(b) but the majority of those who did could also explain the action of a fuse.

Generally **7**(c) was well answered. The quality of labelled diagrams and descriptions indicated that most candidates had carried out a similar experiment in their science lessons.

Question 8

Question **8**(a)(i) was very poorly answered. Ionic was almost as common a choice as covalent. **8**(a)(ii) was also very poorly answered. Hardly any candidates had any idea about weak forces of attraction between molecules.

However, **8**(b)(i) was well answered. Many candidates knew the name of the process and a number scored the second mark. Relatively few scored the mark for **8**(b)(ii). Filtering and evaporation were common wrong answers. Only a small number knew the explanation required for **8**(b)(iii).

8(c) was well answered. The effects of alcohol on the brain and liver were well known.

Question 9

In **9**(a) the uses of electromagnetic radiation were generally well known. Often candidates who selected microwaves for cooking food then selected infrared for mobile phones, but this was not awarded a mark unless accompanied by further explanation.

Very few marks were awarded for **9**(b)(i), which was answered very poorly. Relatively few correct answers to **9**(b)(ii) were seen. A number of candidates incorrectly divided frequency by the speed of light to obtain 10 metres as their answer.

There was much confusion with X-rays and relatively few candidates scored the mark for **9**(c)(i). Highest frequency was a common correct answer to **9**(c)(ii). Comments about penetration were given credit but vague statements about gamma rays travelling far were not given any credit.

The answer to **9**(d)(i) was known by less than half the candidates, and very few scored marks in **9**(d)(ii)

Mark Ranges and Award of Grades

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