



General Certificate of Secondary Education

Applied Science 4861

APSC/2F Science for the Needs of Society

Report on the Examination

2008 examination – June series

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Dr Michael Cresswell Director General.

General Comments

There were relatively few really low scoring candidates and the majority of candidates scored well on the first six low demand questions. The last three questions are designed to be more demanding and this proved to be the case. The absence of a large number of very high scoring candidates can be explained by the fact that the most able students are entered for the Higher tier paper.

Question 1

This question was high scoring and proved to be accessible to the majority of candidates, despite presenting a complex diagram and a substantial amount of information.

Over three quarters of the candidates were awarded 1(a)(i). Most candidates obtained the mark for 1(a)(ii) by suggesting that the nurse should cover the wound with a bandage.

In 1(b) almost half the candidates selected platelets and an even higher proportion knew that white blood cells help to fight harmful bacteria.

The full range of marks were achieved on question 1(c). Almost all candidates correctly named the sweat gland and a good proportion scored all four marks. Sweat was a common wrong answer for the fourth point.

It was clear from candidates' responses to (d) that relatively few understood the principles of heat transfer. Conduction was often given as an answer to the first part of the question.

Question 2

Question 2(a)(i) was well answered with a high proportion scoring this mark, the majority for recognising polyethene as a polymer. A wider range of incorrect responses appeared for question 2(a)(ii). Brick, brass and wood were all quite common answers that were not given any credit. Brass and stainless steel were common correct answers to 2(a)(iii) with lead flashing as the most common wrong answer. A common correct answer to 2(a)(iv) was cotton, but, surprisingly, wood was rarely seen. The specification gives limestone and marble as examples of compounds used straight from the ground to answer 2(a)(v). Lead was a very common wrong answer, but marble was rarely seen.

Many candidates scored both marks for question 2(b) which was well answered.

In part (c), the full range of marks was awarded. It was clear from their answers that many candidates had experience of making mortar but some students forgot to add water to the mix.

Many candidates scored both marks in question 2(d) for either solar panel or wind turbine.

Question 3

The full range of marks was scored on part (a), but relatively few candidates scored all five marks. Smoke was often incorrectly chosen as one of the answers.

Over half the candidates ticked the correct box in 3(b).

Many candidates failed to score any marks for question 3(c), because their answers referred to smoke pollution or they gave vague descriptions about damage to the environment e.g. air pollution. Some candidates wrongly believe that damage to the ozone layer is linked to the combustion of fossil fuels.

Few candidates obtained a mark for 3(d)(i). Vague answers such as 'less pollution' could not be given credit. The second part (3(d)(ii)) was also poorly answered. Answers relating to cost or pollution were not given credit unless further explanation was provided.

Question 4

There seemed to be a good deal of confusion with question 4(a)(i), as answers were often given based on general knowledge or opinions rather than an interpretation of the data. Many candidates thought that more women were taking up smoking. A good proportion of candidates, however, scored the mark for linking a greater number of lung cancer cases to a higher percentage of smokers. Disappointingly few candidates based their answer on the data shown on the graph when responding to 4(a)(ii). Most did not make the connection between previous numbers of smokers and present day numbers of lung cancer cases. Many failed to score a mark for 4(a)(iii), because they referred to the percentage of smokers rather than the number of lung cancer cases.

Question 4(b) was well answered. Many candidates described the addictive nature of nicotine.

4(c) was another well answered question, with many candidates scoring both marks.

Over a third of candidates scored both marks for 4(d)(i), but failed to obtain anything for 4(d)(ii) by not providing enough detail regarding the use of protective clothing.

Question 5

The two parts to question 5(a) were both well answered with at least half the students obtaining the marks.

A good proportion scored this mark for 5(b)(i) by describing the result of the experiment. An explanation of why the bulb lights up was not required and did not score a mark. Almost ninety percent of candidates selected the correct response to part (ii). Approximately one third of candidates selected the correct answer for 5(b)(iii), but a slightly larger number selected low density.

Just over one third of candidates selected the correct answer to question 5(c)(i). A good proportion scored the following mark by matching one of the many responses listed in the mark scheme.

There was a slightly better response to a question on chemical symbols (5(d)(i)), to that in previous papers, but sodium and sulphate were common wrong answers. Just over one third of candidates selected the correct answer for part (ii). The final part of the question (5(d)(iii)) was well answered with pipes and wiring being common correct responses.

Question 6

A good proportion of candidates could carry out the calculation for 6(a)(i), but a much smaller proportion scored the mark on the subsequent part, with 0.0943 or 9.43 being given as fairly common wrong answers.

Question 6(b)(i) was well answered with a good proportion of candidates achieving both marks. Fewer obtained the next mark, although some candidates gained marks here by correctly carrying forward their incorrect answer from part (i). Candidates should be advised to show their working as a mark can often be awarded if an arithmetical error produces an incorrect answer from correct working. Some candidates did not seem confident with the small answer they obtained and ended up multiplying it up for their final answer and so losing the mark.

Question 6(c) was generally well answered, but many candidates only scored the second mark.

There were relatively few candidates who could explain the advantages of a circuit breaker in 6(d). Some students think that fuses are only fitted in appliances, not where the mains electricity is supplied to the house.

Question 7

7(a) was poorly answered. Many described the difference between animal and plant cells. The absence of a vacuole, membrane, cell wall or nucleus was a more common answer than the ones based on a greater number of chloroplasts. Despite not mentioning chloroplasts in part (i), a good proportion scored a mark in part (ii) for explaining that leaf cells carry out photosynthesis.

Although a good number of candidates gained the mark for 7(b)(i), just as many think that plants in greenhouses receive more sunshine and many failed to score the mark because they referred to an enriched CO₂ atmosphere which is picked up in the next part of the question. Photosynthesis was quite well known as the correct answer to part (ii), but many candidates wrote vague statements about carbon dioxide being needed by the plant and this could not be given credit.

The use of fertiliser was a popular answer to 7(c)(i), but some candidates chose organic methods which could not be given any credit. In 7(c)(ii) some correct answers based on the use of fertilisers and pesticides were seen, but many vague explanations about making plants grow better failed to gain any credit. The final part to the question was poorly answered, very few candidates were able to describe how fertilisers or pesticides have harmful effects on ecosystems or wildlife. Many seem to think that fertilisers are directly toxic to wildlife.

Question 8

A fair proportion of candidates could give the name for CaCO₃ in part (a), but quite a few wrote the formula or named the compound as calcium chloride or calcium carbon oxide.

The full range of responses was seen for question 8(b)(i); some candidates left the question blank, some matched all three credit worthy responses in the mark scheme. The second part again saw a wide range of responses. Some good answers were seen, but a significant number of candidates left this question blank. Fractional distillation and filtration were common wrong answers.

8(c) was poorly answered. A considerable number of candidates left this question blank. It was surprising that a number of candidates worked out that water is a product and gave the correct formula, but they did not give the formula for carbon dioxide despite being told in the question that carbon dioxide is a product. The formulae for water and carbon dioxide are listed in the appendix of the specification as two of the molecular formulae that candidates are expected to learn.

Both parts to question 8(d) were well answered. Some candidates, however, did suggest the use of plastic, because it is less fragile in part (ii).

Question 9

A majority of candidates was able to draw a smooth curve through the three points for 9(a)(i). It was puzzling that some candidates attempted to put the fourth point on the graph before drawing the curve. The second two parts ((ii) and (iii)) were generally well answered.

The first two parts to 9(b) were also answered correctly by a large number of candidates. Part (iii), however, had fewer correct responses. Most candidates could only suggest vague answers that did not match any of the marking points.

Neither part of 9(c) was well answered. There was little evidence that candidates had been taught about the expanding universe.

Mark Ranges and Award of Grades

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