



**General Certificate of Secondary Education
June 2011**

**Applied Science (Double Award) APSC/2F
Science for the Needs of Society
Unit 2**

***Report on the
Examination***

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Applied Science (Double Award) Foundation Tier APSC/2F

General

The standard of this paper is in line with the previous years. Many candidates found it difficult to come up with two different responses when asked and so wrote a similar answer twice. Mathematical questions still pose a problem at this level. Two mark questions were not that well answered as many candidates collected one mark for a description but then failed to explain their reasoning.

It is apparent that candidates are not given the opportunity to look at past papers as some of the common mistakes are those that have been made in previous series.

Question 1 (Low Demand)

- (b) (i) A high proportion of candidates answered correctly and most attempted the question. The incorrect answers most frequently seen related to white blood cell or just blood cell.
- (b) (ii) Less than 22% of the candidates achieved this mark. Many responses just stating the word nucleus or even that a red blood cell has a nucleus. Other responses referred to size or shape but did not give enough to get the mark. Many responses indicated what the red blood cell does or where it travels. The most common correct response was no nucleus followed by large surface area.
- (c) Many gained two marks for this question. Incorrect responses usually resulted from more than one line being drawn or linking nicotine to the yellowing of finger nails.
- (d) (i) Most candidates attempted this question and over three quarters gave the correct answer
- (d) (ii) 57% of the candidates did not gain this mark. Many incorrect responses were incorrectly identifying that if you smoke you are 83% more likely to get lung cancer or that the majority of smokers get lung cancer. Other incorrect responses attempted to explain the science behind the substances in cigarette smoke and their link to cancer.
- (d) (iii) Just under half of the candidates obtained this mark. Most incorrect responses concerned trying to explain the cause of lung cancer.

Question 2 (Low Demand)

- (a) Few candidates gained full marks although the question was well attempted. Some candidates placed multiple lines from a box. The most frequently correctly matched item was x rays to bone scanning, followed by infra-red to remote control. Candidates put a range of answers for mobile phones.
- (b) Just over half the candidates gained two marks although the question was well attempted. Many candidates either putting the microwave and ultraviolet light in the incorrect place or choosing the two types of radiation for their response.
- (e) (i)/(ii) Well attempted questions with (e)(i) showing a much better level of correct responses.(e)(ii) showed many different incorrect responses.

Question 3 (Low Demand)

- (a) Less than a third of candidates gained all three marks. The most frequently correctly labelled response was electron.
- (b) Very few candidates gained the mark here despite 90% attempting the question. Candidates clearly had no understanding of what is meant by atomic number
- (c) (i) Few candidates correctly identified the two products. This question also showed a high level of candidates not attempting an answer. The candidates more frequently correctly identified lead than carbon dioxide.
- (c) (ii) A high proportion did not attempt to respond to this question and those that did frequently gave an incorrect response. The most common incorrect answers were 'Ld' and 'L'.

Question 4 (Low Demand)

- (a) (i) Just under 75% of the candidates achieved this mark. Most candidates correctly identified that the water reduced dust. Any response that referred to methane was not given a mark. Some candidates just wrote 'to stop pollution' which was not enough for the mark.
- (a) (ii) Some candidates gave two similar responses which allowed only one mark .
- (a) (iii) Use less machinery was a frequent response as was the idea of moving the mine away from houses or further underground but none of these were given a mark. Use sound proofing was also a common response but without qualification was not given the mark, neither was the idea of sealing the mine to soundproof it.
- (a) (iv) 70% of the candidates obtained this mark. Most common incorrect responses included 'to melt coal' and 'to soften soil'.
- (b) (i) A significant number of candidates gave carbon and water as the answer. This shows a clear mis-understanding of the prefix 'hydro' on hydrocarbon, as well as a poor understanding of what is meant by an element.

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- (b) (ii) Just under a half of the candidates obtained this mark whereas 9% did not answer at all. Incorrect responses were vague ideas that referred to pollution or greenhouse gases, or about the ozone layer.
- (c) (i) Only just over a third of the candidates scored this mark. Some candidates wrote vague answers like 'helps it to grow' or 'gives it food'. Others getting it wrong thought fertilisers keep the soil moist.
- (c) (ii) 75% of candidates did not get this mark. Most common incorrect responses were 'crops grow quicker' or 'crops will grow better'. The idea that the farmer could grow more crops rather than improve yield was a common error.
- (d) Just under 25% of the candidates achieved this mark and 12% did not give an answer. The most common correct response was 'jobs' and incorrect response was 'more coal'. Other incorrect responses referred to the fertiliser or hot water mentioned previously in the question.

Question 5 (Low Demand)

- (a) (i) Many candidates referred to a 'tail' which was awarded the mark if they referred to a 'long tail'. Incorrect responses were mainly along the lines of why the plant needs water or concerned other structures within the cell.
- (a) (ii) Frequently candidates answered incorrectly by referring to the vacuole or cytoplasm in their responses.
- (b) (i) 70% of the candidates scored this mark. Incorrect responses frequently were that 'there was *no* sun in winter' rather than '*less*' sun. Some candidates tried to explain why a plant needs sunlight instead of answering the question.
- (b) (ii) Just over 60% of the candidates achieved this mark. Mostly those who got this wrong answered a different question which was 'how does a greenhouse increase the rate of photosynthesis'. Others just wrote 'change the temperature' without qualification.
- (c) (i) Nearly 50% of the candidates achieved this mark but 11% did not write anything. If candidates only got one mark they either added 50 to 70 or realised that there was a difference of 20 but then put the answer as 70. Other candidates tried to do something with the numbers they were given in the question rather than reading their values from the graph.
- (c) (ii) Over 70% of the candidates did not get this mark. Many incorrect responses just gave a conclusion of the first part of the graph e.g. the higher the carbon dioxide concentration, the higher the rate of photosynthesis. Others explained what a plant needs carbon dioxide for. A few candidates wrote that 750ppm gave a high level but this was not enough for the mark. Very few candidates collected the second marking point for realising that if the CO₂ concentration was increased further, this made no difference.
- (d) Very few candidates gained all three marks. Incorrect responses referred to vague answers such as 'good' in the last space. A fairly equal proportion gained one mark in either of the two first spaces.

Question 6 (Low Demand)

- (a) (i) 85% of the candidates obtained both marks. Mostly the incorrect responses were where multiplication had been attempted or the numbers in the division had been written the wrong way round.
- (a) (ii) Only just over 7% of the candidates obtained this mark. Most candidates did not understand the question. Common incorrect responses referred to how the calculation for 6ai was worked out or to the fact that this was the speed limit on the roads.
- (a) (iii) 10% of the candidates achieved 2 marks and 10% achieved 1 mark. Most candidates receiving the first mark for tired but not the second mark for how that affects the stopping distance or the reaction time. Many candidates actually put that the thinking distance would decrease.
- (a) (iv) Very few candidates obtained 2 marks (0.5% of the candidates) as candidates either got a mark for $16 \div 15$ (50% of the candidates) or the full 3 marks for the correct answer (12% of the candidates)
- (b) Most candidates scored the first mark for driving slowly (61% of the candidates) but few (only 22% of the candidates) got the second mark for ice decreasing friction. Again, some wrote that breaking distance is decreased.
- (c) Nearly 60% of the candidates achieved this mark. Most candidates received this mark for reactions become slower. Many candidates just gave vague statements like 'because you are drunk' or 'you do not know what you are doing'. Many candidates wrote that the reaction time or the thinking time would be reduced. Some candidates just wrote that the thinking or the reaction time would be affected.

Question 7 (Standard Demand)

- (a) (i) 25% of the candidates received two marks for this question. A common incorrect response concerned how to avoid the spread of swine flu when you already have it. Many candidates thought that wearing gloves would help.
- (a) (ii) Just over 50% of the candidates scored no marks for this question. Most common mistakes are that antibiotics are not strong enough or that the disease is too new.
- (b) (i) Only 1% of the candidates scored the three marks available with 20% just picking up one mark and over 70% scored no marks. Some candidates wrote 'small' dose which was not given the mark. Other candidates wrote 'immune' but without explaining how the body becomes immune, or just that the body is ready to fight the disease the next time. The biggest misconception was that the vaccine contains something that forms a barrier that stops the disease from entering the body or the vaccine contains something that kills off the disease.
- (b) (ii) Over 50% of the candidates got both marks for this question and 30% got one. The most common correct response referred to the weak immune system of the elderly or the very young. A common mistake was to say that either of these groups are weak without mentioning their immune system.

Question 8 (Standard Demand)

- (a) Only 20% of the candidates got both marks here. 50% of the candidates got one mark which was mostly for stronger but then gave a similar answer for the second mark. A number of candidates put that polymers are more flexible or malleable. Lots of really random responses such as good conductivity or low melting point. Many responses about cost.
- (b) (i) 50% of the candidates collected one mark here, mostly for length. A great number wrote diameter or weights. Some candidates would use the same rod, pond, fish etc. Others wrote that they would use the same fishing line or that they would repeat it 3 times. Only 9% of the candidates obtained the two marks available.
- (b) (ii) Only 1% of the candidates scored all three marks whereas 25% scored 1 mark. 22% of the candidates did not attempt the question. Many candidates explained how they would use the rod to catch fish. Most responses just tested strength but did not say how they would do this. Very few candidates wrote that they would change the diameter of the line. Few candidates wrote that they would increase the mass on the end of the line, just that they would try one mass.
- (c) (i) Only just under 9% of the candidates got this mark. Many candidates drew in a straight line of best fit. Some candidates drew a straight line between the first and last point on the graph while others drew a line through the middle of the middle points. Some candidates drew a curve up to the point at 1.3mm diameter but then stopped and did not carry the line on to the last point.
- (c) (ii) 72% of the candidates could not read the graph correctly.
- (c) (iii) Many candidates referred to the length of the fishing line rather than the diameter. Only 42% of the candidates came to the correct conclusion. 17% of the candidates did not respond.

Question 9 (Standard Demand)

- (a) (i) Only 2% of the candidates got both marks and only 3% picked up 1 mark. 23% of the candidates did not write anything at all. Most incorrect responses concerned heat rising or heat particles rising. Some candidates confused convection with diffusion. Other incorrect responses were about loft insulation.
- (a) (ii) Very few candidates gave the correct response and clearly did not understand what was meant by 'method of heat transfer'.
- (b) (i) 61% of the candidates obtained all three marks but 10% did not write anything at all. The most common mistake was in the calculation of the total cost of the foil.
- (b) (ii) Over half of the candidates achieved the mark for this question. The most incorrect response was rockwool although some candidates forgot to look at their correctly calculated table to see that foil was the cheapest rather than fibreglass.
- (b) (iii) Less than 4% of the candidates scored two marks available for this question with 50% getting 1 mark and 10% not responding at all. Most candidates picked up the first mark for the highest R value. Those that did not gain the first mark wrote 'a better R value'. The second mark was lost by some candidates as they simply put 'it is warmer' or 'that it lasts longer', or 'you get more rolls of it' or 'it will not need to be replaced as often'.

Mark Ranges and Award of Grades

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