



**General Certificate of Secondary Education  
January 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**

Many candidates clearly still haven't learnt either mathematical or chemical formula mentioned in the specification.

Similar questions from previous exams have not been used successfully eg question 9 on telescopes and infra red waves used for studying universe.

Question 8 on limestone was poorly answered.

Candidates struggled to clearly write responses for longer answer questions and may find it helps to structure answers as bullet points.

Candidates also found it hard to draw a particle diagram in question 2(c) and are clearly confused by particle behaviour.

### **Question 1 (Low Demand)**

- (a) (i) A high proportion of candidates gave the correct answer and nearly all of the candidates attempted this question.
- (a) (ii) Again the large majority of candidates gave the correct answer though slightly fewer compared to the previous question. Most candidates attempted this question.
- (b) Less than half of candidates gained all three marks and an almost similar percentage gained one mark only. Commonly candidates confused oxygen and carbon dioxide placing them incorrectly.
- (c) (i) Nearly three quarters of candidates gained full marks and a high proportion attempted the question.
- (c) (ii) Candidates struggled more with this question with just over half of candidates gaining full marks here. Again a high proportion attempted this question.
- (d) Less than a tenth of candidates gained full marks. Many confused high and low placing them the incorrect way round in the paragraph which accounts for high amount gaining just one mark. A sixth of candidates incorrectly wrote glucose in the first space but gained two marks for the correct positioning of high and low.

### **Question 2 (Low Demand)**

- (a) (i) The large majority of candidates gained full marks. There was some confusion with candidates thinking the paint was an aerosol which was probably due to spray paint use.
- (a) (ii) Candidates struggled far more with this question commonly matching gas trapped inside the liquid with aerosol which then meant that they could not gain any marks for the question. Also a significant number drew more than two lines therefore losing marks.

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- (b) (i) Less than half of candidates gained full marks due to candidates writing vague statements eg boil. Candidates needed to imply that all the water was removed to gain the marks so boiling on its own was insufficient as was heat it.
- (b) (ii) Not many candidates used the words sieve or sieving with many referring to picking out beads. Although this is an acceptable method candidates are expected to use the word sieve in this situation. Frequent incorrect responses included filtering or heating or evaporating. Nearly a fifth of candidates did not attempt this.
- (b) (iii) This part was completed most successfully of the three. Incorrect responses again included heating or boiling. Evaporation was allowed as the question did not ask for the water to be retained.
- (c) Very few candidates gained two marks for this question as candidates seemed unfamiliar with particle diagrams in this context. Incorrect responses often had too few particles for examiners to interpret diagrams. Candidates who gained one mark usually got it for the first marking point, (●) close together at the bottom of the beaker. Most candidates drew chalk articles evenly spread throughout the suspension as if the chalk particles had dissolved.
- (d) (i) Less than half of candidates answered this part accurately. Frequent incorrect answers referred to the volume increasing. Candidates may believe that as a substance has been added to water that it soaks up water and gets bigger. They may also be thinking about substances being added to water and displacing thus increasing water level.
- (d) (ii) A similar number of candidates gave correct answers here. If candidates answered correctly in part (d)(i) they often gained marks in this part. Again there was confusion about water being soaked up by sugar. Some candidates answered evaporation in both parts.

### Question 3 (Low Demand)

- (a) Nearly three quarters of candidates correctly placed the labels on the diagram. Candidates who gained only one mark usually confused generator and condenser.
- (b) (i) Most candidates attempted this part and just over half of the candidates gained full marks.
- (b) (ii) Slightly more candidates gained full marks for this part and again nearly all candidates attempted it.
- (c) (i) Although most candidates attempted this question two thirds gave an incorrect response. The commonest correct answers involved good conductor, of heat, or high melting point. Incorrect answers included it does not rust, despite the fact that the question does not refer to iron or steel but brass. Candidates were unclear about the difference between rust and corrosion. Also some candidates referred to boiling point rather than melting.
- (c) (ii) Less than half of the candidates gained the mark for this question as responses were often too vague. For example statements such as, it will affect the habitat

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and it will be too hot. Mark worthy answers referred to the wildlife being killed by the heat. Some candidates talked about heat increasing algae but did not explain why this is a problem.

- (d) Candidates answered this fairly well with nearly three quarters gaining full marks. In correct responses candidates often referred to the increased use of renewables eg we will be using more solar power. Other incorrect responses included vague statements such as, it causes pollution or it is bad for the environment.
- (e) Candidates were again quite successful with this part with an even spread of responses referring to water and wind. Incorrect responses included references to processes that result in steam, eg nuclear or biomass, and vague answers such as air.
- (f) Half of the candidates gave the correct answer. However, very few candidates gave working which could have helped them to gain one mark when their answer was incorrect, hence a third gained no marks. Common problems included dividing 219 by 68 then multiplying by 100.

#### Question 4 (Low Demand)

- (a) Slightly more than half of the candidates gained full marks. A very common mistake was for candidates to write fungus next to yoghurt and bacteria next to penicillin resulting in just one mark. This may be due to candidates not understanding the differences between types of microorganisms.
- (b) (i) Only a quarter of candidates gained the mark with a tenth not attempting it. Incorrect answers included liver and stomach.
- (b) (ii) A fifth of candidates were successful with this part with a sixth not attempting it. Candidates wrote sugar, which is a generic term, rather than glucose.
- (b) (iii) A quarter of the candidates did not attempt this part and of those that did few gained the mark. Many candidates wrote that the blood sugar decreases without explaining how insulin does this.
- (b) (iv) 80 % of students gained one mark and nobody gained the full two marks. The most common mistake was getting the multiplication of the bacteria and inserting the insulin gene in the wrong order.
- (b) (v) Fewer than a quarter of candidates gained the mark here. Most commonly candidates gaining the mark referred to the transfer of diseases from pig to human and often mentioned swine flu. Some candidates correctly referred to side effects or allergic reactions.
- (c) (i) Over four fifths gained the mark for this question, although a significant few didn't attempt it.
- (c) (ii) Far more candidates struggled with this part with just under a half getting it correct. Nearly a tenth did not attempt it.
- (c) (iii) Just over a third gained the mark for this question. The majority of correct answers talked about the repair of wounds or fighting bacteria. The first involves making new cells not scab formation and the latter is the role of the white blood

cells. Candidates must clearly distinguish between bacteria being prevented from gaining entry into the wound, platelet function, and the fighting of microbes, white blood cell function.

### Question 5 (Low Demand)

- (a) A sixth of candidates gained two marks for this part. Candidates were more likely to know the formula for carbon dioxide than be able to identify methane from its formula. A third of candidates who attempted the question gained no marks.
- (b) (i) Just under half of the candidates gained the mark here although most attempted the question. Incorrect responses which gained no marks included the water ending up in clouds or rivers which, although true, is not where the majority of water ended up.
- (b) (ii) Well under a tenth of candidates gained both marks for this question. Many candidates appeared to use formulae from the table in part (a). Also many candidates who did use either O or H then went on to write incorrect numbers or omitted numbers altogether.
- (c) (i) Just under a third of candidates gained both marks for this question and over a half gained one mark. The majority of candidates who gained only one mark did so by referring to the amount of carbon dioxide decreasing.
- (c) (ii) Almost four fifths of candidates gained the marks for this question. Some, however, who failed to gain the mark referred to the trend across the whole graph and not to what occurred between 400 and 300 million years ago, eg it went up and down and then up again.
- (c) (iii) This was a very poorly answered question with fewer than a tenth of candidates gaining two marks and just over a fifth one mark. Those who did gain a mark often referred to plants photosynthesising, eg plants do photosynthesis, or plants release it, with few putting both responses. Incorrect answers were often vague and did not refer to photosynthesis at all, these responses included, humans have chopped down lots of trees and even there are more humans using oxygen.

### Question 6 (Low Demand)

- (a) In this part half of the candidates gained one mark and a further third gained two.
- (b) This was very poorly done with hardly any candidates gaining all four marks. There were candidates who, having filled in three spaces correctly, produced a fourth word assuming that they could only use each word once, eg gamma, delta, beta, alpha. Also some candidates were using other information from the table at the beginning of question 6 eg paper, aluminium or lead.
- (c) (i) Just over a quarter of candidates gained a mark for this question. This was mainly due to references to bacteria or microorganisms being removed from an object instead of being killed or destroyed.
- (c) (ii) Many candidates repeated their answer from part (c)(i) so that less than a quarter of candidates scored the mark. Some candidates also incorrectly referred to the perceived strength of gamma radiation.

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- (c) (iii) Candidates performed much better here than in part(c)(i) and(c)(ii)with over a half getting the mark and of them referred to plastic being melted. Incorrect responses usually referred to heat not being strong enough to kill microbes.
- (c) (iv) Again only just over a quarter of candidates correctly answered this question. The common correct answers referred to worries about radiation killing people or causing cancer. Most common incorrect responses referred to the risk of radiation remaining on the equipment. There were also many vague answers about it causing harm.

### Question 7 (Standard Demand)

- (a) This question was poorly done with only a small number gaining full marks. Candidates failed to mention correct changes to volume and pressure in the thorax. Not many candidates even managed two marks. Commonly candidates correctly identified contraction of intercostal muscles but then stated that the diaphragm relaxed or went up.
- (b) (i) Only a sixth of candidates gave the correct answer to this part and a further sixth didn't even attempt the question. Common incorrect answers included BPM, which is the normal abbreviation for heart rate, or candidates used seconds or 10 seconds rather than per minute in their response
- (b) (ii) Very few candidates performed the calculation correctly to gain the full three marks. A similarly small number of candidates managed to gain two marks by giving the answer 22.2%. A fifth of candidates gained a mark for the correct use of the formula but with incorrect values. The most common calculation error seen was  $(40 \div 55) \times 100$  which gained just one mark.
- (b) (iii) Hardly any candidates gained both marks for this question. Just under a half of candidates managed to get a mark usually for the first bullet point. Nearly a tenth of candidates did not attempt the question at all.

### Question 8 (Standard Demand)

- (a) Under a tenth of candidates were successful here and nearly a fifth did not attempt this part.
- (b) (i) The most common correct answer referred to heat with very few candidates writing thermal decomposition. Three quarters of candidates answered incorrectly and wrote extra information such as heat and add sand etc.
- (b) (ii) Here just under a half of candidates were correct though some were still putting numbers in the wrong place.
- (b) (iii) With this part nearly a third of candidates answered correctly while a sixth did not attempt it. The correct answers were evenly split between global warming and the greenhouse effect. Significant numbers wrote greenhouse gas or just pollution.
- (c) (i) Here candidates were just making up a formula for non existent compounds with very few candidates scoring any marks at all.

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- (c) (ii) Quite a few candidates referred to reactions in a kiln, using information from earlier in the question. Candidates commonly wrote gives out heat and while some had the idea that the reaction involved heat they incorrectly wrote, eg a reaction that needs heat.
- (d) The most common correct answer given by candidates was sand with sodium carbonate rarely seen. Other incorrect substances included glass and water.

**Question 9 (Standard Demand)**

- (a) (i) Candidates plotted the graph reasonably well with over a half gaining both marks. Some candidates plotted points on the x axis correctly but didn't plot the value negatively on the y axis.
- (a) (ii) Over half of candidates were correct with wrong answers usually relating to candidates missing the negative symbol.
- (a) (iii) Four fifths answered this correctly while incorrect answers were either, its close to the sun or it's bigger than earth.
- (a) (iv) There were few correct responses here. Most incorrect answers involved candidates writing, it's below freezing with no reference to water. Other candidates put it's too cold for people to survive and other similar vague statements.
- (b) Hardly any candidates gained marks for this part. Many of the answers were vague eg less in the way and other wrong answers involved candidates stating it's nearer to the stars, you can see more of space and it won't make people ill with radiation.
- (c) (i) Less than a tenth of answers were correct and a quarter of candidates left it blank. Incorrect responses included universe is expanding, which is the answer to part (c)(ii). There were also references to wavelength being bigger or smaller.
- (c) (ii) This was answered better than part (c)(i) with a fifth getting the mark. Some candidates put planet, stars or galaxies moving further away. A fifth of candidates did not attempt this part.

**Mark Ranges and Award of Grades**

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