



General Certificate of Secondary Education

**Applied Science (Double Award)
4861**

APSC/2F Science for the Needs of Society

Report on the Examination

2010 examination – January series

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General comments

Overall the candidates found this exam easier than those of previous series which may be due to the lack of equations the candidates had to deal with this time. This is reflected in the mean mark being higher. Fewer candidates are leaving blank spaces where they have not even attempted a question. Where candidates did not do so well was the longer answer describing or explaining questions.

Question 1

- (a) (i) Most candidates were able to answer this question correctly.
- (a) (ii) Again, this question was mostly answered correctly.
- (b) (i) Less than half of the candidates picked up the mark here.
- (b) (ii) Over half of the candidates got no marks here. Of the rest, most gained both of the marks available.
- (c) The majority of candidates picked up one of the two marks available here. Many candidates correctly identifying no chloroplast. Many talk about root hair cell having a tail but not referring to extended cell membrane or wall. Many candidates also gave vague statements referring to shape. Some candidates also referred to the size of the vacuole. Some candidates answered that 'the leaf cell is used for photosynthesis' or similar without stating a difference or a reference to chloroplasts.
- (d) (i) The majority of the candidates gained one mark here.
- (d) (ii) Only half of the responses gained the mark here.
- (d) (iii) This was a well answered question, with almost all of the candidates gaining the mark here.
- (d) (iv) Most candidates were able to answer this question correctly.

Question 2

- (a) (i) Very few candidates seemed to get all items labelled all items correctly. The most common two mark answer was 'neutron' and 'electron' correctly labelled but with 'ion' instead of 'nucleus'. One mark answers were often either 'nucleus' or 'electron' correctly labelled, many got 'electron' and 'neutron' in wrong place. There was some confusion of nucleus and neutron and several candidates writing neuron or iron.
- (a) (ii) Half of the candidates got one mark on the question.
- (b) (i) Formula for methane was not well known.
- (b) (ii) Only a third of the candidates picked up this mark.
- (b) (iii) Two thirds of the candidates got this mark.
- (b) (iv) Not many candidates were able to give a correct use for methane.

Question 3

- (a) Less than half of the candidates got two marks. The most common correct marks were for more light produced and less energy wasted. A lot of candidates incorrectly talk about energy being 'used' or the cost of the bulbs. Few candidates mention that the energy wasted is as heat energy.
- (b) (i) Only a half of the candidates got one mark.
- (b) (ii) The majority of candidates scored a mark for this question.
- (c) Just under half of all candidates only got one mark. A common scenario was usually having the microwave bar correctly plotted at 1200J/s and the computer bar plotted at 320J/s.
- (d) (i) Most candidates were able to link all the devices correctly to gain full marks. Very few candidates did not score on this question.
- (d) (ii) Half of the candidates achieved the mark. Many candidates used the word portable although some explained that they need to be carried around away from the mains supply of electricity. Incorrect answers included references to the amount of electricity used and ease of the recharging. Some candidates incorrectly refer to saving electricity or that they don't require a lot of electricity.
- (d) (iii) Again, half of the candidates gained a mark here. Most correct answers referred to the batteries not being powerful enough. Incorrect answers included referring to strength or kettles not needing to be portable (confused with question above). Many candidates talk about needing lots of batteries but not going on to say this would be expensive. Many also talk about it being dangerous to mix batteries and water or that the kettle might blow up. Quite a lot of candidates think the kettle will get too hot and the batteries will melt.

Question 4

- (a) (i) Most candidates were able to identify an organ that is damaged by long term alcohol use.
- (a) (ii) Less than half of candidates selected the correct word for this question.
- (a) (iii) Two thirds of candidates managed to gain two marks, with almost a third of candidates gaining a single mark.
- (b) Most candidates achieved a mark for this question. More deaths was all that was required here, most generally got there in the end. Some candidates generalised and talked about the harm caused by tobacco and alcohol but did not refer to the table.
- (c) (i) Just over half of the candidates were able to identify the antibiotic.
- (c) (ii) However, less than half of the candidates could identify the drug that can be used as a painkiller and as an anti-inflammatory.
- (c) (iii) The majority of candidates gained no marks and it was obvious which candidates had been taught this. A lot of candidates described the body becoming resistant to antibiotics. Other incorrect reasons were thinking antibiotics are painkillers; not being harmful or dangerous enough to be treated by antibiotics; not wanting people to become addicted to the antibiotic or not wanting resistance to develop; referring to 'colds being immune to antibiotics'; referring to 'colds not being that harmful so your body can fight it off on its own'.
- (d) About half of candidates achieved full marks. Most common correct answers are pain relief and addiction. The most common correct answer for one mark was pain relief. Candidates assume that the drug is smoked and therefore talk about damage to lungs. Some candidates talk about curing the disease rather than relieving pain.

Question 5

- (a) (i) Just over half of the candidates got this mark.
- (a) (ii) Most candidates gained two marks, with very few scoring a single mark.
- (b) (i) Just under half of candidates answered this question correctly.
- (b) (ii) The most common correct answer was 'deodorant', followed by 'hairspray' and 'air freshener'. Some incorrect answers referred to the table above eg foam or small particles in a liquid etc. Also appearing as an incorrect answer was gas. Other correct answers included body spray, fly spray, spray paint, furniture polish and named products such as Lynx and Oust.
- (b) (iii) This question was not answered well, with only a quarter of candidates gaining a mark.
- (c) (i) Half of the candidates were able to name carbon dioxide as a greenhouse gas released by some power stations.
- (c) (ii) Over half gained no marks. The most correct answer for one mark was for the burning mark point. Some candidates refer to heating but not burning. Incorrect answers often describe the chemical reaction of oxygen and carbon reacting together to form carbon dioxide.
- (c) (iii) Lots of vague answers eg don't waste energy or use alternative fuels or use less fuel. Quite a few candidates mentioned stopping using aerosols and were obviously confused as to which type of gas is being discussed. 'Don't use greenhouses' came up a few times. A lot of candidates just put down two renewable options so only scored one mark.

Question 6

- (a) (i) Over half of the candidates correctly selected conduction for this mark.
- (a) (ii) Again, over half of the candidates gained this mark.
- (b) (i) Only a quarter of candidates scored any marks, with only a tiny percentage picking up both marks.
- (b) (ii) About half of candidates scored one mark. Incorrect answers include references to the element not melting at high temperatures.
- (b) (iii) This question was answered well however, some candidates wrote about metal but not plastic. Quite a few candidates again stated that it doesn't melt at high temperatures or that it's light.
- (c) (i) Only half of candidates were able to identify that conduction occurs best through solids.
- (c) (ii) Many candidates were able to answer this question correctly.
- (d) (i) Less than a quarter of candidates gained this mark. Most incorrect answers refer to attracting/conducting heat rather than absorbing heat. Insulator was only seen rarely but most got the idea of the pipe not getting hot.
- (d) (ii) Under half of the candidates gave a correct answer. Most incorrect answers talk about attracting/conducting heat rather than reflecting or referring to the silver foil insulating the pipe. The mark was awarded here for reflecting light.

Question 7

- (a) (i) Almost all of the candidates were able to gain the mark for this question.
- (a) (ii) The vast majority of candidates answered this question correctly. Incorrect answers were vague references to preservatives or E-numbers without a specific additive being named or a reference to the amount of calories with no cause. Quite a few candidates were stating saturated fats not just fats. Sugar with either chocolate or sweets was the most common response. Acid with sweets/apple and cocoa with chocolate was also mentioned.
- (b) (i) Again, most candidates were able to answer this question correctly.
- (b) (ii) About half of the candidates were able to identify that insulin is produced by the pancreas.
- (b) (iii) Only a few candidates were able to pick up both marks, with under half of candidates scoring one mark.
- (c) Just under 50% gained this mark. The most common correct answers given were blood or blood stream. The most incorrect answers referred either to cells or the nervous system.
- (d) Quite a few candidates think that the sweat glands and capillaries send signals to the hairs. Many candidates gained one mark for sweat but were just stating it cools you down and not explaining how. A few candidates wrote how shaving helps to cool you down. There were some references to going outside/taking clothes off/laying down/stop exercising etc. Some candidates think sweat is cooler than body temperature, and that hairs stand up to trap cold air. Also some candidates referred to capillaries moving and not capillaries widening.

Question 8

- (a) Only a quarter of candidates scored at least one mark for this question. A tiny proportion of candidates were able to achieve both marks.
- (b) (i) Many candidates were able to gain at least one mark, however only a few more were able to gain two marks.
- (b) (ii) Over a half of candidates gained nothing for this question. Very few candidates were able to pick up two marks.
- (c) (i) The majority of candidates were able to name a modern material used to make window frames.
- (c) (ii) The most common correct answer was doesn't rot. Lasts longer was another common correct response. Incorrect answers most commonly referred to it allowing less heat to be lost or good insulator (confused with double glazing). Quite a few candidates also incorrectly refer to it being waterproof. Quite a few candidates were using words like erode and corrode when referring to wood instead of rot or decay. Also quite a few candidates referred to plastic not melting or burning away.
- (c) (iii) Many candidates were using incorrect statements like 'it looks nicer', 'cheaper', 'stronger' and 'natural'. Some candidates wrote disadvantages such as 'it will rot away so you will have to get another one', or 'it breaks easily'. Very few candidates gained a mark on this question.

Question 9

- (a) Most candidates were able to name a fossil fuel.
- (b) (i) Only half of the candidates gained this mark. There were quite a few incorrect and vague statements eg it can poison you/it can harm you. Most candidates who gained a mark correctly stated that nuclear radiation causes cancer, with death then cell damage being the next most frequent correct responses. Quite a few candidates incorrectly stated it pollutes the air or produces toxic gases or it's too hot. Some candidates even referred to greenhouse gases.
- (b) (ii) Just under a third of candidates were able to say that lead is the best material to stop gamma radiation.
- (b) (iii) Many candidates were writing x-rays (confusion with medical imaging?). Treatment of cancer was the most common correct answer. Some vague statements such as 'to treat diseases', 'to see things', 'used in hospitals' or even just the word 'cancer'. Answers also appearing frequently were sun beds, mobile phone and microwaves. Some candidates think that cancer and tumours are different. Also many candidates were writing chemotherapy.
- (c) (i) Not many candidates gained this mark. Most of the incorrect responses referred to either 'hydroelectric power' or 'wind power' (not reading that it was motion of sea).
- (c) (ii) Most candidates picked up at least one mark, with half of candidates achieving two marks. Only a few candidates were able to gain full marks. The most common correct response was not always sunny. Some candidates also wrote not always windy. Very few answered the hydroelectric disadvantage correctly with many referring to cost, to tides/waves or has to be in a certain place without stating where this might be. Some candidates think wind power causes storms/hurricanes.

Mark Ranges and Award of Grades

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