



**General Certificate of Secondary Education**

**Additional Applied Science 4863**

**AASC/2F Science at Work**

**Report on the Examination**

*2010 examination – January series*

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## General comments

All parts of the questions were attempted by the majority of candidates. Question 1 on Forensic Science was answered well. Questions that required detailed application of knowledge were not answered so well, for example the use of nutrients in the body in question 2 and 3. Plotting a graph proved difficult for many of the weaker candidates.

### Question 1

- (a) The majority of candidates picked out the correct equipment to collect the material.
- (b) Many candidates knew that DNA was obtained from blood but not so many knew about blood groups.
- (c) Most knew that saliva contains DNA.
- (d) Please advise candidates to use the conventional names for clothing eg body suit. Some lost marks by referring to special suits or protective coats. Even a hazmat suit was mentioned. The reasons for wearing protective clothing were well known.

### Question 2

- (a) The function of vitamins in the body was not well known and the answers given were random. Most knew that calcium was important for bones and teeth and that liver was a good source of vitamin D, although quite a few thought orange, maybe because they associated Sunny D as having vitamin D in?
- (b) Using logic to work out how many grams of tangerine you would need was not very well done. Many could get one mark for  $60/30 = 2$  but could not then translate that to two lots of 100grams. Just over half the candidates knew that Vitamin C was an antioxidant but quite a few thought it was a preservative.

### Question 3

- (a) Many candidates could identify protein as being important to the weightlifter but not the reasons why. It was not generally well known that it builds muscles. Carbohydrate needed for energy was better understood. Potato was widely recognised as a carbohydrate but egg was often chosen as the second example. Two correct responses were needed for the mark.
- (b) Testing urine for glucose was not well known or if the test was known the answer was poorly expressed. No marks were given for putting a piece of paper or a stick into the urine. Dipstick was the response we were looking for. Many candidates scored one mark for looking for a colour change. More successful answers used the Benedict's test which is not really a method used by sports physiologists.

#### Question 4

- (a) Not many candidates knew the purpose of chromatography and only just over half knew the chemicals dissolved in a solvent.
- (b) Just under half of the candidates scored one or more marks from the six marking points allowed, often for using chromatography paper or putting the ink at the bottom of the paper. Candidates often knew the process but did not explain themselves in enough detail, for example, not putting the ink at the bottom of the paper and making sure the solvent is below the ink. Some were leaving the experiment without saying why.
- (c) Most recognised C and half could explain why.
- (d) Most recognised D and half could explain why the note may not have been written by the suspect.

#### Question 5

- (a) There were a wide range of graphs drawn. Marks were not given for a line graph as the question clearly states a bar graph, although histograms were accepted. Plotting was generally very good but candidates need more practice with making a scale. Many lost marks through not having an even scale. Weaker candidates said the graph shows the numbers of organic chickens but more successful candidates were able to recognise it showed an increase in organic chickens. The reasons for that were not so good; many wanted to describe the shape of the graph rather than the reasons behind the figures.
- (b) Most answers referred to the chickens having extra space. Few answers mentioned chemicals not being used although quite a few mentioned organic or natural food. The classic disadvantages of rearing animals organically; more labour involved and more space needed were not often mentioned. Many were referring to it being more expensive which was allowed but not 'they cost more'. Some candidates lost marks by not qualifying their answer eg 'Takes longer' – takes longer to do what?

### Question 6

- (a) Rubber was the most popular answer, but many candidates are still giving plastic as an example. Please advise candidates to avoid using plastic as a type of material. Plastic is a general term for a wide range of synthetic materials, not all of which would be suitable for the job.
- (b) The information in the table was not well used and candidates gave a range of properties of carbon fibre without thinking about why that property would be useful for the shaft of the golf club, eg melting point. Similarly with the properties of titanium. Many were confusing hardness with strength. Hardness is how easy the material is to scratch or dent and is an important feature of golf clubs. Many were confusing hardness with strength and saying hard so it won't break easily which did not get the mark.
- (c) A minority of candidates knew that carbon fibre reinforced plastic is a composite.
- (d) Many were referring to cost; synthetic materials are not necessarily cheaper than natural ones. The general term, comfortable, should be avoided or at least explained. Why are they more comfortable? Because they are more flexible/soft would get the mark.

## **Mark Ranges and Award of Grades**

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