**General Certificate of Education (A-level)
June 2011**

Science in Society   SCIS1

(Specification 2400)

Unit 1: Exploring key scientific issues

Report on the Examination

General Comments

The paper this year appeared accessible to candidates with a good range of marks achieved. The majority of candidates were able to tackle most questions, and there was little evidence that they ran out of time.

Many candidates were able to identify House Science Works (HSW) ideas, and candidates who gained higher grades were able to support the points they made with examples or explanation. Questions involving HSW ideas relating to 'Developing and testing scientific explanations', 'The scientific community', and 'relationships between science and society' were often well answered. However, there was evidence that questions involving 'Data and their limitations' and 'Establishing causal links' were less well answered. In their answers some candidates referred to results being 'significant' or 'not significant' using a colloquial meaning implying importance, rather than the more scientific meaning of the likelihood that the difference in two results are due to chance.

When answering questions relating to science explanations candidates should ensure that they read the question carefully and tailor their answer to the question, rather than providing a standard description or explanation. Further details will be given in the specific questions involved.

Question 1

There were some good descriptions of the active immune response in 1a(i), and it is apparent from 1a(ii) and 1b(i) that advertising campaigns encouraging good hygiene to combat flu have made an impact, as has information regarding the importance of completing courses of antibiotics. However, in 1b(i) a number of candidates repeated information about taking the full course of the antibiotics, rather than conscious explaining how a population of bacteria could become resistant to the antibiotic. There were poor explanations given, with candidates describing mutation and the development of resistance as a act on the part of the bacteria.

In part 1b(ii) many candidates were aware of the need to compare the data for June 2004 and March 2008. The scale was unusual, and a number of candidates failed to gain marks as a result of misreading points on the graphs. It would have been helpful for candidates to use a ruler to identify the appropriate values on the graphs and to refer to these in their answers.

Question 2

Many candidates were able to discuss the need for comparability when measuring the CO_2 emissions from new cars. However, a number of candidates stated 'fair test' and this was not credited. At AS level we would expect candidates to go beyond a simplistic view of fair testing and be able to explain what they mean in more detail.

It is disappointing to note that in 2c(i) and 2c(ii) a number of candidates are still unable to explain how carbon dioxide and carbon monoxide are produced in a car engine .

In 2c(iv) many candidates were able to link an aggressive style of driving with an increase in the production of CO_2. Candidates who achieved at a higher grade were also able to link higher fuel consumption with the increased production of CO_2

Question 3

In question 3b many candidates were able to explain the importance of having a control district, however, fewer were able to describe the baseline survey as providing information on the district before the trial began again to allow a comparison before and after the intervention.

The importance of using the range and the mean in presenting the results from the IHHP was not always well understood. Many candidates were able to state that the range showed the variation in the physical activity (though some thought that it represented the error in the measurements). More able candidates were able to recognise that it was possible to have the same mean values with different ranges of data.

The longer answer question, 3d, was generally well answered with many candidates producing L2 answers. To reach the top level of answer candidates needed to evaluate the effect, rather than simply describe the trends in the data. A few candidates spent considerable effort explaining the trial process and others wrote about general ways in which diet, smoking and exercise could affect health with no reference to the IHPP data, both of which provided few opportunities for gaining credit.

Question 4

Many candidates were able to correctly interpret the diagram showing relationships between different hominin in 4a(i) and 4a(ii). In 4a(iii) and 4a(iv) general answers related to how long ago the species lived were not credited.

In part 4b many candidates appeared unable to relate their knowledge of natural selection or evolution to the development of a new species on an isolated island. Many answers involved general descriptions of natural selection, including a few which related the evolution of giraffes. At this level candidates are expected to be able to tailor their knowledge of Science Explanations to the specific context of the question, and produce responses that answer the question asked.

Part 4c was a significant contrast to 4b with many candidates producing reasoned answers, using HSW ideas and with supporting evidence from the context given in the question stem.

Question 5

Very few candidates were able to give a definition of the activity of a radioactive isotope in 5a(ii). More candidates were able to draw a graph showing the half-life of a sample of Iodine-131 in part 5a(iii).

A number of candidates provided detailed information about the development of a new drug in 5b(iii), apparently without reference to the question they were asked. In the introduction to the question candidates were told that the treatment described had undergone a phase 1 clinical trial, and were asked to identify key features of further trials. Answers involving previous stages were therefore not credit-worthy.

Question 6

In this question many candidates made a good attempt at interpreting the data. In 6b(i) many candidates were able to discuss the mean and the overlapping ranges of the weights of the different cohorts of babies. Some candidates thought that the difference in number of babies would invalidate the data or make the study unfair; apparently not appreciating that calculating an average value would allow comparison of the data-set. In 6b(ii) most candidates realised that they needed to compare the percentage or proportion of babies born with a major birth defect, and were able to gain marks. A few candidates unfortunately assumed that one or other of the procedures would inherently lead to more defects and explained why, rather than looking at the data to support their answer.

Question 7

The science explanations examined in this question were, in general, poorly understood by candidates, with very few appreciating the size of a galaxy or able to give a good description of the big bang.

The HSW ideas were, in contrast, generally well understood with many candidates producing credit-worthy answers.

Question 8

Many candidates were able to provide good definitions of a regulatory body in 8a(i) and genetic modification in 8a(ii). A few candidates simply restated the stem e.g. 'a body with regulates things' or 'when you modify something's genetics' which were not deemed credit-worthy.

In 8a(iii) most candidates could explain, often in terms of the ethics of testing on humans, why we would want animals with similar symptoms. Fewer candidates were able to gain the second mark for linking this to the creation of GM animals where there is no naturally occurring analogue of the disease in animals.

Many candidates were able to link species of animal to public distaste. Better candidates were also able to gain credit for recognising that **both** regulatory *and* practical consideration were likely to play a greater role in the species of animals used in research.

The longer answer question 8c allowed the majority of candidates to gain at least L2 in their answer. There were some pleasing answers seen with candidates who gained higher grades were able to produce ethical and scientific arguments for and against use of animals in research. A few candidates also managed to write their answer as if for a textbook, and this generally allowed them to access the higher level of marks.

However, there were some candidates who did not answer the question asked and instead produced a justification of their view on animal testing, producing polemical writing, often characterised by the use of rhetorical questions. A very small number of scripts seen also discussed the use animals to test make-up and other beauty products when the question was specifically asking about the use of animals in scientific research. These candidates generally were unable to access the higher levels in the mark scheme.

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