AQA

ASSESSMENT and

QUALIFICATIONS

ALLIANCE

General Certificate of Education

Science in Society 1401

SCIS1   Exploring Key Scientific Issues

Report on the Examination

2009 examination - June series

GCE Science in Society, SCIS1, Exploring Key Scientific Issues

General Comments

This paper required a significant amount of reading. Candidates appeared, on the whole, to have coped well with the paper, and there was no evidence that they ran out of time to answer the later questions.

It was rather disappointing to note that there were significant gaps in students' Understanding of Science Explanations, with GCSE level knowledge being conspicuously absent in some cases. This was particularly surprising in Darwin 200 year, when very few candidates were able to give a good account of evolution by natural selection.

More pleasingly, many candidates were able to identify examples of How Science Works from the questions, and candidates who gained higher grades were able to generalise from the specific information given in the question to explain ideas about How Science Works. On the whole, many candidates were able to use the data given in the questions to support their answers. They should be encouraged to do this, supporting general assertions with specific information taken from the data.

Candidates need to be reminded that the longer six mark questions, which include marks for quality of written communication, need a very different approach from the rest. We expect a more thoughtful response, written as a well structured argument, supported by several pieces of evidence, drawn from their own knowledge as well as from the question itself. A list of relevant points gained few marks unless provided as part of an argument. Candidates should be discouraged from writing vague statements, or repeating information from the question without adding information.

Candidates who were at the bottom end of the grade range generally showed poor Understanding of Science Explanations and were unable to apply their knowledge of How Science Works to the novel contexts in the questions. Those candidates who reached the higher grades were able to recall the majority of the Science Explanations required, and were able to go beyond the information given in the question. There were also generally better at interpreting graphical/numerical data and using it to support their reasoning.

Question 1

In part (a)(ii) many candidates recognised that with reporting the national and international authorities would know where GWD was occurring, but only a few candidates were able to say what the authorities might do with that knowledge to prevent spread of GWD.

A number of candidates referred to the Guinea worms becoming immune to drugs, or mutating to avoid being killed by them, showing a confused understanding of the Germ theory of disease.

Although the majority of candidates were able to identify that there was no overall trend in the data given in part (b), many answers were given in terms of absolute number of cases, rather than the reduction of cases or percentage decrease.

Question 2

Sadly, a number of candidates appeared to have misread the question in part (a) and gave (often poor) answers describing the combustion of oil, rather than framing their answer in terms of dissipation of energy.

Part (b) (i) was a difficult numerical calculation, and the majority of candidates were unable to calculate the percentage increase even when they had correctly calculated the use of oil in 1971 and 2005.

A few candidates gave answers to part (c) in terms of oil used for transport, rather than worldwide use of oil, and this was penalised. There was also little evidence from the candidates that they believe that governments will act using legislation to reduce oil use as a measure to reduce global warming.

The majority of candidates were able to use Figure 4 to answer (d) (ii), giving a good summary of the different types of biofuel compared with petrol from crude oil. Poorer answers tended to give general advantages and disadvantages of biofuels without reference to specific examples from the data.

Question 3

Candidates tended to give general answers to the first parts of this question. In (a) (iii), many candidates appeared not to have fully understood the inheritance pattern given in the family tree and suggested that Mary did not have the mutated form of the gene. Candidates who did well in this part of the question had often annotated the diagram in Figure 5 to help them make sense of the information given. In part (a) (iv) a number of candidates suggested that Elton would not inherit the gene because he was male and men do not get breast cancer.

In the long answer question, some candidates used half of the space with the introduction to their letter, necessitating a continuation page. Whilst their correct use of addressing the letter was commendable, it was not credit-worthy in this context. There was some confusion amongst candidates about what PGD was, and what the licence was for. In general pro-life and religious answers made the same point about sanctity of life repeatedly and so did not often score in the top mark range. Candidates who repeated the stem of the question without adding their own ideas also scored low marks.

Question 4

This question presented Science Explanations (evolution) and How Science Works ('data and their limitations', 'the scientific community' and 'relationships between science and society') in a format unfamiliar to the students.

A large majority of candidates were able to give at least one difference between newspaper reports and research papers in part (a), and over half were able to recognise the parasitic relationship between lice and gorilla/human.

As mentioned earlier, in part (c) an astonishingly large number of students were unable to describe the process of natural selection, even before they tried to use it to explain how two separate lice species might have arisen. Far too many answers talked about natural selection as if the lice, as a species, knew how they had to adapt, rather than including a discussion of

the natural variation between individuals within a species. Some candidates simply gave vague answers about 'survival of the fittest' without further elaboration.

In (d)(i), candidates were expected to recognise that there was a range given for the divergence data because it was an average from a number of different studies/measurements. Many candidates gave answers in terms of how long ago the divergence occurred, or that scientists could not be certain it was the correct date.

Question 5

Again the quality of Science Explanations given to parts (a)(i) and (a)(ii) were generally poor. Many candidates gave generic answers rather than giving physical differences between ionising and non-ionising radiation. In (a)(ii), a number of candidates did not give answers relating to electromagnetic radiation.

However, many candidates were able to use ideas about risk to gain at least one mark in part (b), though to gain both marks candidates were expected to give two separate reasons for the different attitudes to risk rather than repeating the converse of their first reason. For example, 'mobiles are small and people choose to use mobiles, but they do not have much choice about a phone mast being built next to them' would be given one mark only.

In (c)(i), many candidates were able to describe a double-blind study correctly in this context, although a number suggested that the researchers were unaware of the aims of the research, rather than not knowing the conditions. A few candidates misread the experiment and thought that the subjects and researchers did not know if they were 'electrosensitive'.

Question 6

This question was generally answered well, and gave less able candidates the opportunity to identify examples of How Science Works from the passage.

In part (c), a few candidates discussed whether they agreed that Pluto should have been renamed, rather than talking about whether our ideas about 'the way in which we think about the solar system' had changed.

Question 7

This was one of the more difficult questions on the paper, with some students misreading the axes of the graph, and thinking that it was a measure of opinion about the popularity of fluoridation.

In (a)(iii), candidates were expected to use data taken from the graph to draw conclusions about the impact of fluoridation on the risk of tooth decay. Many candidates gave generalised statements without supporting evidence.

Part (b)(i) was answered very well, with most candidates being able to give at least one factor that might have been matched in the study. In (b)(ii), some candidates referred to tooth decay rather than the study on bone cancer, and many thought that the different numbers in each group was the most significant source of error in the study.

Question 8

In the final question on the paper candidates are expected to assimilate information from a number of different written sources and use the information to answer the questions. Many candidates appeared to be able to do this well.

In part (a) (i) most candidates were able to identify the 'human interest' reason but few were able to answer in terms of why clinical results might not be reported in the newspaper.

The description of what happens when a cancer forms was examining the candidates' knowledge of Science Explanations, and (b) (i) was not as well answered as we would have expected. However, many candidates displayed a good knowledge of the stages in the testing of medicines, and the reasons for each stage in (b) (ii).

In part (d), candidates who scored highly were able to go beyond the specific example of Velcade given in the stimulus material, and explained the factors they would consider in wider terms. Many candidates talked about 'cost effectiveness' without explaining how this would be measured – better answers discussed having to balance the disadvantages (costs) with the benefits to the patients, and were able to give specific examples of what those costs and benefits might be.

Poorer answers listed the stages involved in drug testing or talked about whether patients would be able to afford the drug. Many answers included the idea that the money spent on developing the drug could be used elsewhere in the Health Service without apparent recognition that a private company would have already developed the drug before NICE could consider it, and so there were no savings to be made in the development.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results statistics page of the AQA Website.