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Science in Society SCIS3

(Specification 2400)

Unit 3: Exploring key scientific issues

Report on the Examination

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General Comments

This is the second year that the A2 Science in Society question papers were sat by candidates. There was a good range of scores obtained on the paper. The majority of candidates appeared to have completed the paper without running out of time.

Candidates should be reminded that when discussing data in the form of graphs that they should refer to specific values, rather than give general statements. In a number of questions some candidates referred to general trends which did not fit the whole of the data-set shown.

Question 1

This question was generally well answered, with candidates showing an understanding of both the science explanations and the How Science Works (HSW) ideas.

In 1b(i) many candidates recognised that male and female brains appeared to develop at a different rate, and were able to describe the possible effect on the age at which the brain reached maturity. Candidates who were also able relate their answer to the differences between the three brain measurements in the graphs were able to achieve full marks.

Candidates who gained both marks in 1b(ii) were able to identify that the thickness in the corpus callosum did not appear to correlate with integration skills. Some candidates assumed that men must be better at those skills, even though the stem stated the opposite.

In part 1c(ii) a number of candidates appeared to think that the peer review process involved scientists repeating measurements made by the papers authors. This view was not credit-worthy, as it does not correctly reflect the peer-review process.

Question 2

The majority of candidates were able to correctly label the diagram in 2a(i).

In 2a(ii) many candidates appeared to understand that there was an increase in dopamine in the synapse, but were not always able to explain why this led to more frequent impulses.

Very few candidates were able to describe the meaning of the standard deviation in b(ii) with many describing it incorrectly as the numerical range of the data.

Although candidates were able to recognise the HSW ideas that were being examined in this question, some were unable to express them clearly especially those related to ‘establishing causal links’ and ‘developing and testing scientific explanations’. A number of candidates described the different numbers in each group as the most important factor in the quality of the explanation, rather than linking with ideas of correlation and cause. Such answers were unable to access the full mark range.

Question 3

The use of graphical data in this question was generally poor, with candidates not interpreting the information correctly, or giving vague answers. This was disappointing, as in the previous AS-level candidates (almost all of whom you would expect to be in this cohort) were apparently able to describe trends in data clearly and in detail. Candidates should be encouraged to transfer this skill from AS to A2.

In part 3(a) most candidates were able to identify why percentage canopy cover influences growth and yield of cocoa trees.

Many candidates gave very general descriptions for the relationship between canopy cover and species richness in Figure 5A. The most common answer was that as canopy cover decreased so did species richness. Very few candidates commented on the change in the trend below 58% coverage. A number of candidates stated that there was an inverse relationship between the two, apparently taking the negative slope of the graph as indication of this, and not taking into account the scale on the x-axis. Such answers were not deemed credit-worthy.

In part b(ii) the majority of candidates did not link the impact of cocoa plantations with conservation of species found in undisturbed forest. Many just reiterated the effect of canopy cover on species richness, and consequently were unable to gain both marks for the answer.

In contrast to much of the rest of the question 3(d) was well answered. Many candidates were able to describe the advantages and limitations of their chosen option, with better answers also including data from the graphs to support the explanations.

Question 4

Question parts relating to the information presented in Figure 6 were generally well answered, with many candidates being able to interpret the data.

In 4b(i) Candidates appeared to have a fairly simplistic view about the use of interdisciplinary teams in developing climate models, with answers involving bias and taking a lot of time being most popular. Similarly, in 4b(ii), explanations as to why models can't represent exactly what was happening to the Earth's climate rarely went beyond answers involving natural disasters and unexpected events, with a number of candidates confusing weather and climate.

The concept of positive feedback in 4b(ii) was generally well understood, with many candidates correctly identifying albedo as an important factor, and that as ice melted more radiation was absorbed leading to warmer water which led to more ice melting etc.

Question 5

Many candidates were able to access the marks available in parts 5(a) to 5(c) in this question with a good understanding of the limitations of both nuclear and wind energy being shown.

In part 5(d) some candidates did not appreciate the difference between technical and political feasibility, and so were unable to gain full marks. In future, candidates should be encouraged to provide evidence to support the points they make in 3 and 4 mark questions as this allows them to gain more marks.

Question 6

Some of the science explanations which were examined in this question were generally not well understood with many candidates unable to give a good explanation of gene expression or how it can be controlled. In their answers to 6b(i) some candidates referred to results being 'significant' using a colloquial meaning implying importance, rather than the scientific/statistical meaning. However, in 6(c) the use of fMRI, what it measures and the advantages and limitations of the technique were better understood.

In 6b(ii) most candidates were able to recognise at least one reason for the relevance of the additional information given in Figure 9.

Candidates who scored well in 6(e) were able to make at least two good points about the inappropriateness of focussing on a single gene, and provide additional explanation of their ideas.

Question 7

In this question candidates were expected to use examples that they have studied throughout the Science in Society course to discuss the quotation given. This year the question gave some guidance about what to include in the response.

Answers involving nuclear power were very common. Whilst nuclear power is no longer a new technology, candidates who were able to explain why it was hard to quantify the risk when the technology was introduced were able to score in the upper mark bands. More limited responses often only provided a cost-benefit analysis for nuclear power, or referred to recent events in Japan.

Weaker answers focussed solely on decision making regarding risks, or limited their answer to the risks a single scientific advance. Many of these answers did not make use of the guidance given in the question and so were unable to access the full range of marks available.

It is important that candidates answer the question as it is asked, identifying the specific HSW idea that is being discussed.

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