AQA

**General Certificate of Education (A-level)
January 2012**

Human Biology   **HBIO2**

(Specification 2405)

Unit 2: Humans - their origins and adaptations

Report on the Examination

General comments

The majority of students were well prepared for this exam, evidenced in a good display of knowledge of unit content with factual recall and basic data interpretation questions.

Some concepts that have repeatedly been assessed are still failing to achieve high scores. The majority of students failed to score highly on questions that required them to link concepts and explain their own suggestions. A reasonably large number of students saw a key word in the question and recalled a pre-learned, generic answer that did not specifically address the question asked. Students would be well advised, again, to take time to think about the requirements of each question before beginning to answer it. Where students were directed to use in their answer data provided in the question, they mainly failed to do so. In some questions there was also evidence of very poor quality of written communication.

Question 1

Students seemed to find 1(a) and 1(b) to be accessible opening questions. In 1(b), some students failed to relate the structure they suggested to an appropriate function.

Question 2

It was clear from question 2 that most students taking this paper were A2 students, as many concepts were brought in from HBIO4, section 3.4.1. Students, however, erroneously gave examples involving meiosis. 2(a) also asked for two examples; a minority gave three examples and, as the third example was incorrect, lost a mark they had already been awarded through the 'list rule'. In 2(b), the confusion between mitosis and meiosis became more apparent with many mixed, and incomplete, ideas.

Question 3

In 3(a), students made errors such as stating a gene to be a sequence of amino acids. There seemed to be confusion between DNA, bases, amino acids and chromosomes. The quality of written communication on this question was poor, with students gaining marking point one, but then stating that a gene codes for multiple proteins. In 3(b), there was very little understanding of what a metabolic pathway is. Just over half of students gained two marks on 3(c), however students are still stating that amino acids are made/produced/formed.

Question 4

In 4(a), students tended not to use Figure 2 as the question stated and gave basic generic answers about the overall outcome of non-disjunction. In 4(b), students misinterpreted the diagram, assuming every chromosome/chromatid was chromosome 21. They also told only part of the story, either gaining marking point two or three but not both in many cases.

Question 5

5(a) and 5(c) were well answered in most cases with students displaying a good level of factual recall and application of knowledge. In 5(b), students failed to make the link between a bacterium being a parasite and gave generic pre-learned features of other parasites that *Salmonella enteritidis* does not have, such as hooks and suckers for attachment and well developed reproductive organs.

Question 6

In 6(a), students who failed to score two marks attempted to explain rather than describe. In 6(b), almost all students failed to interpret the question correctly, with the majority scoring zero. They interpreted the question as why do *Homo sapiens* have an adolescent period, assuming it could have been shown, rather than why it is only shown for them in the data. 6(c) was also misinterpreted and, therefore, answered incorrectly. Many students looked at it from the viewpoint of children using facial expressions rather than being able to interpret them. Some students further misinterpreted the question by changing the five-year-old children in the question to babies.

Question 7

Question 7 appeared to give many examples of students not reading and answering the question set. In 7(a), many seemed to write about the negative impact of farming generally, rather than why it caused deforestation.   Part 7(b) produced a number of responses that considered methodology, rather than using the data as the question asked. In 7(c), quite a few wrote about characteristics of monocultures, rather than their impact on biodiversity, and again, wrote pre-learned generic answers that did not specifically relate to this question.

Question 8

Students found 8(a)(i) to be very accessible and displayed good interpretation of the data. They were, however, unable to follow up their descriptions with reasons in 8(a)(ii), making a lot of assumptions about the athlete and non-athlete lifestyle, giving reasons that did not match their descriptions and very basic answers such as 'the heart muscle is stronger.' In 8(b)(i), students failed to suggest more than one energy source and thought running out of ATP for the last 30 seconds of the race would be fine. For parts of 8(b), students failed to interpret the data correctly, making the assumptions that maximum rate of ATP production was total ATP production and that respiration of triglycerides only starts to supply ATP after 10 000 seconds

Question 9

In 9(a), the way students described the differences let them down. Many stated the tumour decreased in size, which they did not, whichever the treatment. Not many students referred to standard deviation in their responses. 9(b)(i) was well answered with just under three-quarters gaining the mark. In 9(b)(ii), several students again described that TA reduces the mass of tumours, rather than reducing growth. Some failed to evaluate, instead just suggesting that it should or should not be used.

Question 10

10(a) was well answered by most. In 10(a)(i), some only stated potassium or argon dating rather than potassium-argon dating, in 10(a)(ii), some students failed to give evidence that could be used to distinguish between the fossil skeleton, either just naming a part and not stating how it could distinguish or naming something that would not be found on a fossil skeleton. The quality of written communication in 10(b) was particularly poor. 10(b)(i) was only answered correctly by a third of students, this was down to both a lack of knowledge and incorrect use of basic terminology. The underlying theme of 10(b)(ii) has been asked on previous papers, answers given tended to be very generalised and not related to this question. The range of acceptable responses on the mark scheme should have meant all students achieved. Students were suggesting that mutations will always cause advantageous characteristics and only these individuals survive and all others die. They were also stating that alleles (not individuals) have a selective advantage and that alleles are more likely to survive. As a result, just over a fifth of students scored over four marks. In 10(b)(iii), the majority of students misinterpreted interbreeding as 'inbreeding' and, as such, less than two per cent of students scored two marks. Most students found 10(c) and 10(d) to be an accessible end to the paper. The concepts in 10(c) have often been tested before. Students failed to score through not explaining the benefit. The most common misconception was that vitamin D is either absorbed or comes from, or is made by, sunlight.

Mark Ranges and Award of Grades

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