Version 1.0

General Certificate of Education (A-level)
June 2012

Human Biology HBIO2

(Specification 2405)

Unit 2: Humans - their origins and adaptations

Report on the Examination

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General Comments

Overall students seemed to find the paper accessible with no evidence of any general misinterpretation of questions. There were some very impressive answers on tougher questions, such as 6(c). There was clear evidence of students displaying a good understanding of the unit content covered on the exam paper. There were, however, some obvious gaps in knowledge as evidenced in students not scoring well on easier AO1 recall questions. Generally, questions involving interpretation of data presented graphically or in tables were well answered but calculations caused problems for many students. Less able students often failed to gain credit due to the use of imprecise or inappropriate scientific terminology, the inability to understand certain command words and missing key words in the stem of questions.

Question 1

(a) In this part some students thought they only needed to place one tick in each row/column, otherwise, they scored well on what is a basic AO1 question.

(b) This part was again, a basic AO1 question, where most students should score well, but only forty two percent of students gained a mark. Those who failed to score normally made incorrect assumptions, such as ATP can diffuse anywhere in the body/to where it is needed, and that ATP does not have to be broken down to release energy and that it will never run out.

Question 2

(a)&(b) These parts were generally well answered by most students with the majority scoring full marks.

(c) This part was generally well answered by most students and the mark scheme allowed for a range of responses. Of the seventeen percent who failed to score the most common error was to only refer to tissue rather than cells.

Question 3

Some students seemed to ignore the instruction that they could use each type of evidence once, more than once, or not at all. Some clearly did not understand the meaning of the words, but this was generally well answered by most with eighty two percent scoring four or more marks. The most common confusion was with students thinking that chimpanzee babies and human babies both being breastfed by their mothers is biochemical evidence.

Question 4

(a) This is a fairly common AO1 question, and for one mark is accessible. Those who failed to score seemed to confuse homologous chromosomes with sister chromatids.

(b) This part was generally well done by most students; the statistics show they either knew how to work this out or not, with only six percent scoring one mark.

(c)(i) There was a surprising number of students who seemed to confuse the idea of DNA damage with enzyme damage, stating temperature and pH as their two responses. Other students who failed to score gave answers that were too vague, e.g. smoking.

(c)(ii) This was generally well answered by most students, with seventy four percent gaining the mark. Those who failed to score tended to name a type of cell that they thought could be damaged to produce a tumour cell, e.g. skin cell, rather than a gene.

Question 5

(a) There was a lot of poor Quality of Written Communication, e.g. lives/feeds 'off' host. Sixty percent of students failed to gain mark point one as a result, with most picking up mark point two. There were occasional general answers about parasites that did not relate to this question.

(b)(i) Students got the idea of mark point one, after which most answers became vague, e.g. for mark point three students stating that the immune system does not attack red blood cells rather than using the term white blood cells or antibodies. General ideas about parasites also came up on this question, including ideas about cuticles and living in the gut where the immune system does not function. Only twenty one percent of the cohort scored two marks.

(b)(ii) In this part, the question was not addressed by the students' responses, i.e. candidates did not give an explanation of how *Plasmodium* is more likely to complete its life cycle, rather how it is likely to survive, as a result only eleven percent of students scored two marks. Some did not address the idea of 'more likely' either, and therefore the idea of 'more' was missing in their answers. Some did not seem to understand that the blood consists of more than just red blood cells.

Question 6

(a)(i) This is a common AO1 question and was generally well answered by the majority of students.

(a)(ii) This part was also generally well done by the majority. In theory, the mark scheme for part (b) made this an easy three mark question; however, only thirty four percent scored three. Confusion arose when students tried to include messenger RNA and transfer RNA in their answers. These may have been A2 students resitting this paper, as this level of knowledge is not required as AS level. There was also some confusion between what polynucleotides and polypeptides are and also where they are located.

(c) It appears, that this was the toughest question on the paper; only two percent of the cohort scored three marks and sixty percent failed to score at all. Some did not understand that *Acetabularia* is unicellular, and as a result discussed repair of cells by mitosis, others could not apply the idea of DNA to RNA to protein to this question.

Question 7

(a)(i) This was well answered by the majority, with eighty five percent of the cohort scoring the mark. Students occasionally answered just potassium dating or argon dating. There was poor spelling of the word stratigraphy.

(a)(ii) The majority of students explained the method of how carbon dating could be used but did not explain why it could be used, as such only twenty six percent score the mark.

(b) This was well answered, as it was very open question with any suitable piece of evidence being accepted.

(c) This was also generally well answered. It was a very open question with any suitable piece of evidence being accepted. Some students gave evidence just that these

humans used stone tools e.g. they had opposable thumbs, and but not evidence that they used stone tools to prepare food.

(d) Some students just repeated the stem with slight expansion, i.e. they hunted animals and gathered berries, this was not accepted.

Question 8

(a) Sixty seven percent of students knew how to calculate cardiac output. There were occasional responses that did not include multiplication and several guesses that were a long way off the mark.

(b) Forty percent of the students did not know how to work out 68% of 25 dm^3, and so were unable to score on this question.

(c) This was a reasonably difficult data-handling question, on which half of students scored well. Those who failed to score either misinterpreted the graph, or gave responses alluding to the fact they thought an 11% difference was not a significant change. These may have been A2 students, as statistical significance only appears in the A2 course of study.

(d) This was an easy question for students to score two marks and sixty six percent did score two marks. Students failed on mark point four for referring to signals/messages and not impulses and failed on mark point five for just stating an impulse/impulses rather than more impulses, go to the heart/SAN.

Question 9

(a) Although this a common AO1 question that was answered badly by half of the students. The idea of preservation was missing.

(b) Thirty nine percent of the students seemed to ignore the idea of studying DNA as stated in the stem and only discussed amino acids and proteins. There were several generic answers and many students using terms, often irrelevant, in their answers in the hope that they would score marks.

(c) This was quite well answered with over half of the students scoring one or two marks; errors came in with basic understanding, e.g. students thinking vitamin D is contained within sunlight. Several students discussed the idea of light skin having the advantage of camouflage in the snow; this was not accepted.

(d) Students scored well on this question. There were quite a few generic answers, but in this case, they could still score marks.

Question 10

(a) Mark point one was quite well answered. Some stated that a tumour is made of fast growing/dividing cells; this was not accepted as the same could be said of the skin, but this is not a tumour. Only thirteen percent of students scored mark point two.

(b) This part produced a range of responses and a good spread across the mark range, the majority scoring on mark points two to six but not many gaining mark point one, only seven percent failed to score any marks at all. Terminology was well applied in this question.

(c) Students were easily gaining mark point one with their responses, however students still seem to not understand the difference between tumours and cancer, and so only

six percent scored mark point two. This was also the case on the January 2012 HBIO4 paper.

(d)(i) Students clearly understood what is meant by 'wild' but not 'population.' Common erroneous responses included that a population is a group of similar species. Only seven percent of students scored two marks on this question.

(d)(ii) Seventy four percent of students scored well on this question. Those who only scored one mark normally responded with several suggested advantages but no explanations. The question clearly asks for one advantage to be suggested and explained.

(d)(iii) Students gave fairly vague, general answers or only gave one idea that was not expanded on in any way so only scored one mark. Twenty percent of the cohort scored two marks.

(e) This part was well answered by many students; again the mark scheme was quite open with any suitable advantage/disadvantage being accepted. A good spread of marks was seen, with only five percent failing to score any marks. Errors arose when students thought that the fungus would be injected, and some students continue to incorrectly believe that fungi are a type of bacteria. Most did evaluate successfully, although some only discussed advantages or disadvantages.

Mark Ranges and Award of Grades

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