

Examiners' Report/  
Principal Examiner Feedback

January 2013

International GCSE Human Biology  
(4HB0)  
Paper 01

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# International Human Biology paper 4HB0 01

## General

This was the fourth paper of the International GCSE qualification in Human Biology. It was felt candidates found it slightly more demanding than that sat in January 2012, mainly due to the more applied nature of the planning question. However, the questions did relate to the specification well. The candidates' performance seemed to be a little lower than that of the June 2012 paper. The paper discriminated well and the full range of marks was seen for each part of each question. Centres are to be congratulated for preparing their candidates well for this paper, taking on board comments from previous reports. .

## Question 1

The multiple-choice questions gave candidates a gentle start to the paper. Most scored well, although (i) the genetic question and (j) parts of the eye that refract light caused some candidates problems.

## Question 2

This question was about the testing of foods - methods, safety features and conclusions from result. It was generally answered well.

- (a) Most candidates knew Benedict's.
- (b) Most candidates could name the measuring cylinder and could draw the line/meniscus correctly. However, a few candidates missed drawing the line for some reason.
- (c) The majority of candidates named at least one safety feature, usually the wearing of goggles. Fewer gave another suitable precaution relating to the safe heating of Benedict's
- (d) Most candidates recognised that glucose was present in food Y, but not present in food X, although some gave the answers the wrong way round and others thought that neither food contained glucose.

## Question 3

This question centred on food chains, relationships between different organisms and energy flow. It was generally answered well.

- (a) Almost all candidates were able to draw lines correctly from the producers to the primary consumers from the information present. A few lost a mark because the arrows on the lines were the wrong way round or missing. Candidates should note that the direction of arrows towards the organism(s) that are doing the eating are an important feature of completing food chains and food webs.
- (b) Almost all candidates scored the mark here for naming either animal X or animal Y.
- (c) Most candidates gained two marks here, usually for saying that the number would increase because there was more food. Credit was given for candidates who explained that the number would decrease as the humans had lost one of their sources of food.

(d) Most candidates gained the two marks here, usually for respiration and either excretion or egestion.

#### Question 4

This question was all about teeth - the different types and their functions. It also tested the candidates' knowledge and understanding of tooth decay. It was generally answered well.

(a) Most candidates correctly gave 8 for the number of premolars, but some gave 4, presumably not realizing that there would be the same number in both the lower and upper jaws.

(b) The vast majority knew that molars were for grinding or chewing food, but a significant number mixed up the function of incisors with that of canines and talked about the role of incisors being to hold or tear food, rather than for biting or cutting.

(c) Most candidates scored at least two marks for mentioning acid and enamel. Some got confused between starch and sugars and some did not mention bacteria as having a role.

#### Question 5

This question tested the candidates' knowledge and understanding of different types of blood cells. It was generally answered well, although there was sometimes confusion about the role of different types of white blood cells.

(a) Most candidates gained at least one mark for saying that energy requirements for males rise with age. Some also gained the second mark, but some just quoted the data instead of drawing conclusions.

(b) Most candidates gained at least the two marks here, usually by referring to poorer growth or to Kwashiorkor or a description of the symptoms, such as a swollen stomach. .

#### Question 6

This question tested candidates' knowledge and understanding of bones and muscles, including the antagonistic action of muscles to raise or lower limbs. It was generally answered well.

(a) The majority of candidates scored at least two marks for naming the bones of the arm and shoulder, although a few got radius and ulna the wrong way round.

(b) There was a mixed response to this question about the type of joint - synovial. Some candidates gave hinge or ball and socket, neither of which was suitable for both the shoulder and elbow joints.

(c) Almost all candidates were able to name biceps and triceps - and to get them the right way round. However, in the second part of the question, some did get the contraction and relaxation the wrong way round. Some candidates gained marks for mentioning that the biceps and triceps worked antagonistically and also for showing that they understood the meaning of the term.

## Question 7

This question was based around the structure and function of the ear and eye. It also tested the candidates' knowledge and understanding of the nervous system transport and tested the candidates' knowledge of diffusion and osmosis. .

- (a) Most candidates gained at least two or three marks, usually for the eardrum, stapes and cochlea. Only the better candidates selected pinna, despite it being shown in the diagram.
- (b) Many candidates gained one or two marks here. If a mark was lost, it was usually for not mentioning suspensory ligaments. Some candidates mentioned ciliary muscles and suspensory ligaments, but unfortunately had the contraction the wrong way round.
- (c) This was a question where candidates tended to talk about the whole of the nervous pathway, instead of just that from the brain to the legs, as asked in the question. The majority scored two marks here, usually for mentioning impulses and motor neurons. Not many talked about neurotransmitters or synapses.
- (d) This part of the question was answered well with the large majority of candidates gaining three or four marks. It was clear that the effect of adrenalin was known well.

## Question 8

This question tested the candidates' knowledge and understanding of the respiratory system, including their ability to apply that knowledge in an experimental situation. It was clear that most candidates had some knowledge, but some did not give or know enough specific detail.

- (a) The first part was not particularly answered well and under half the candidates did not gain the mark. Many did not mention the idea of the maximum volume and others incorrectly thought that it was the difference between volumes breathed in and out.
- (b) This question had a mixed response. Many candidates gained a mark for the idea of blowing into the tube. However, it appeared that some were confused about what would happen to the water level. There was evidence that those candidates who had carried out this method knew that the water level would fall and that the difference in level in the calibrated plastic bottle gave the vital capacity. .
- (c) The majority of candidates gained the first two marks here, but some did not circle a value in the table and others circled more than one value.
- (d) Many candidates gained full marks here, but some lost a mark as they did not mention vital capacity. Few mentioned that the muscles associated with the lungs would be stronger. .

### Question 9

This question centred on food containing energy. It allowed candidates to demonstrate their knowledge about food types and how the diet of a woman should change if she was pregnant. It also tested candidates' ability to plan an experiment.

- (a) Most candidates correctly identified minerals and fibre. .
- (b) Most candidates gained at least one mark here and many gained two, usually for mentioning more protein should be eaten for the growth of the fetus.
- (c) This question discriminated well; with only the better candidates gaining four or five marks. Some were confused by the question, despite this CORMS-type of question being a regular feature in the papers. Those who were able to give a suitable method tended to forget about fair-testing.

### Question 10

This question was about the kidney and excretion. It tested the candidates' knowledge and understanding of the structure and function of different parts of the kidney and also their ability to apply their knowledge to a new situation. . .

- (a) Almost all candidates gained at least two marks for identifying the Bowman's capsule and the collecting duct. There was, however, some confusion about naming the proximal or first convoluted tubule. In the second part, most candidates gained at least two marks, usually for mentioning ultrafiltration under high pressure. Some did not give enough detail about what was and what was not filtered in order to gain the third mark.
- (b) About half the candidates gained two marks in the first part. Rarely was one some candidates did not appear to have any idea how to calculate percentages, although this type of question has been asked in the past. Most gained the two marks in the second part for knowing that urea was a waste product and thus excreted and that glucose was needed by the body. Some added that it was required for respiration. The third part was badly answered, with not many candidates realizing that sodium and glucose are reabsorbed by active transport. Many wrongly believe that movement is by diffusion.
- (c) Many candidates applied their knowledge well in this question and used the information given well. Usually two marks were gained, for realizing that there would be decreased permeability of the kidney tubules, meaning that less water would be reabsorbed. A third mark could have easily been obtained if they had added 'into the blood'. However, not many said this.

### Question 11

This question tested the candidates' knowledge and understanding of homeostasis. It was answered fairly well by most candidates. .

- (a) Most candidates gained the two marks here, usually for the idea that blood it diverted to the skin and more heat is lost to the environment. Fewer appeared to know that the arterioles would dilate, despite the inclusion of a diagram in the question.

(b) Many candidates gained two marks here. A variety of answers were seen including the idea that hairs would lie flat thus not trapping an insulating layer of air and sweat evaporates taking away with it latent heat from the body. Unfortunately, a few candidates gained no marks as they talked about vasoconstriction, despite being asked not to in the question.

(c) Many candidates gained the two marks for a correct definition of homeostasis. Some lost marks as they referred to a particular method, instead of giving a general definition of the term. The second part of the question was answered well, with many candidates gaining the full three marks, usually for saying that insulin would be released from the pancreas if blood glucose rose. A few candidates scored no marks as they did not refer to blood glucose as asked in the question.

## Question 12

This final question tested candidates' knowledge and understanding of genetics, including their ability to apply their knowledge to sickle cell trait and protection against malaria. It discriminated well, providing the whole range of marks for each part of the question.

- (a) Just over half of the candidates were able to give a definition of an allele. Some candidates appeared confused about the relationship between alleles, genes and chromosomes.
- (b) Many candidates gained one mark here, for answering half of the question. They used the information in the text well to say that two faulty alleles are required. However, only the better candidates went on to say that if the allele was dominant then only one would be required for a person to have the disease.
- (c) Many candidates carried out the cross well and gained the full four marks. Some did not fully answer the question and give the final percentage or proportion and thus lost a mark. Others appeared to think wrongly that the condition was sex-linked.
- (d) The majority of candidates did not really answer the question asked and just repeated the question in their answer. The very best candidates scored the full three marks, with answers that were very clearly explained. Some candidates appeared to have some understanding, but did not relate their answers clearly enough to the inheritance of alleles.



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