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June 2011

International GCSE Human Biology (4HB0) Paper 01

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June 2011
Publications Code UG028235

International GCSE Human Biology 4HB0 01 Report - Summer 2011

General

This was the first sitting for the new International GCSE Human Biology specification. It was felt to be of a similar standard to equivalent papers such as the legacy O level Human Biology and International GCSE Biology. The candidates' performance seemed to be high when compared, for example, to that seen in previous International GCSE Biology series. The paper discriminated well and the full range of marks was seen for each part of each question, although the mean mark was fairly high. Centres are to be congratulated for preparing their candidates well for this paper.

Comments on individual questions

Question 1

The multiple choice questions were answered well, with many candidates scoring eight marks or more. The questions that were answered less well were (g) where some candidates were unable to calculate how much carbohydrate was eaten, forgetting to divide 84 by 2, and (j) where not all candidates realised that all four gases are greenhouse gases.

Question 2

This question tested the candidates' knowledge and understanding of food testing.

(a) Most candidates were able to select the correct chemicals from the list given that should be used for starch, glucose, lipid and protein. The few candidates who did not gain full marks tended to wrongly put limewater to test for lipid.

(b) Most candidates gained marks for selecting the correct colour if the food group was present. Not all gained the marks for selecting the correct colour if the food group was absent. A common wrong answer was white. (c) Most knew that if the temperature increases, the rate of photosynthesis increases.

(d) Most candidates correctly identified two from carbon, hydrogen and oxygen. The former two were most commonly given. A few candidates clearly did not understand what is meant by an element.

Question 3

This question tested the candidates' knowledge of the structure and function of the human eye.

(a) Almost all candidates correctly identified A, the iris.

(c) The large majority of candidates gain the mark for correctly identifying the lens and cornea. However, a few candidates incorrectly put the A, the iris as one of their choices and unfortunately lost the mark.

(d) On the whole this was answered well. The vast majority of candidates who got it wrong placed the line too close to the fovea.

Question 4

This question focused on reproduction, particularly that of the female. Generally, it was answered well.

(a) Most candidates gained full marks here. A common theme within the incorrect answers related to male secondary characteristics, e.g. "deepening of voice" and "facial hair". This suggests that those candidates may have confused male and female secondary sexual characteristics or misread the question.

(b) (i) This was not done very successfully on the whole as a significant number of candidates failed to appropriately mark the progesterone line as persistently high. A common mistake was to draw the line high from day 0 of the menstrual cycle. Many responses were left blank for this item and so I assume the candidates were not confident of how to tackle the question or simply missed reading it.

(ii) The vast majority of candidates correctly answered this as LH or luteinising hormone. The most common wrong answer was FSH.

(c) This question was answered well by the vast majority of candidates with many achieving full marks and very few candidates scoring zero. Those that were incorrect mainly used the correct terms but inappropriately (i.e. in the wrong spaces). In addition, meiosis was written instead of mitosis. Only correct spellings of mitosis were accepted.

Question 5

This question tested the candidates' knowledge and understanding of the respiratory system.

(a) Most candidates scored the two marks. The most common mistake was to name B as bronchiole instead of bronchus.

(b) Most candidates were able to gain full marks here with common responses being two marks from reference to both external and internal intercostals muscles and one mark from ribs moving up and out. Weaker candidates confused the contraction /relaxation of the intercostals muscles or referred to 'stretching' of muscles.

(c) This was answered well with most candidates gaining the two marks. Occasionally candidates mixed up the definitions for tidal volume and for vital capacity.

(d) Most candidates gained the mark for spirometer. Some incorrectly put respirometer and others simply left the answer blank.

Question 6

This question was about the structure and function of the human digestive system. It also tested the candidates' knowledge and understanding of the chemical digestion of good groups and also of the importance of dietary fibre.

(a) Almost all candidates gained a mark for identifying the stomach on the diagram. The majority also gained a mark for identifying proteins as being the food group that was first digested in the stomach. The most common wrong answer was carbohydrates.

(b) Many candidates gained the three marks here. Common wrong answers were peptides instead of amino acids as the end product of protein digestion and also maltase instead of amylase as the enzyme involved in breaking down starch to maltose.

(c) The vast majority of candidates correctly identified potatoes and rice. Some candidates wrongly substituted chocolate for one of these answers. A few

candidates put more than two ticks, thus losing a mark despite having identified the two correct answers.
(d) This question was largely done well with most candidates able to recall lack of fibre leads to constipation/bowel cancer. Some candidates were keen to use scientific words such as 'peristalsis' or 'bolus' but these terms were at times used incorrectly. A few candidates scored no marks as they concentrated on the idea that water retention was caused by fibre.

Question 7
This question tested the candidates' knowledge and understanding of the structure and function of the skeletal system.
(a) Most candidates gained the two marks for the correct identification of the humerus and the scapula, although some incorrectly had shoulder bone for the latter.
(b) Most candidates correctly completed the table to show which parts belonged to the axial skeleton and which belonged to the appendicular skeleton. Some candidates were confused as to which were which despite having an example of each already filled in the box for them.
(c) Most candidates achieved one mark for this question, but not many gained the two marks. There were many in depth descriptions of the movements that can be achieved with the shoulder, but this alone only gained one mark. The second mark, awarded for appreciating that the shoulder is a site of muscle attachment was very rarely attained.

Question 8
This question was about food chains. It also tested candidates' knowledge of eutrophication. It was generally answered well.
(a) Most candidates attained full marks in part (i). Weaker candidates sent their arrows in the wrong direction or gave a circular diagram that did not emphasise sheep in the middle or effective arrows. Almost all candidates were able to name sheep as the primary consumer, although one or two put humans. In part (iii) many candidates made lists of reasons for the energy loss, but very few linked the two together. They would state that energy was lost in excretion and movement, but not link it to respiration. Not all digested not linked to energy lost in faeces. To gain the two marks, the information had to be linked to give a clear explanation.
(b) Most candidates answered this question well with full reference to at least four of the marking points. 'Eutrophication' was a prevalent answer and the majority of candidates referred to 'oxygen depletion'. Where responses were poor candidates described 'poisoning' of the water but did not detail how this happened.

Question 9

This question was about cystic fibrosis. It tested the candidates' knowledge and understanding of recessive alleles as well as the link between cystic fibrosis and difficulties in exercising. It also tested the candidates' ability to interpret data.

(a) A range of answers was seen here. Most able candidates referred to 'characteristics not expressed in the presence of a dominant allele'. Several answers referred to 'only seen in the homozygous state'. Weaker candidates referred to the representation of a recessive allele by small letters but did not explain what a recessive allele actually meant.

(b) Most candidates were able to give some interpretations of the graph and gain at least one mark. The strongest responses were seen where the candidates gave a straightforward account of the trend for all three age groups. Few candidates included comments on quantitative data or the current death rate for under 1 year olds to gain the 4th mark. The weaker candidates gave general comments about the inheritance of cystic fibrosis or the improvement of medication but did not interpret the readings on the graph. These candidates did not score on this question.

(c) Most candidates scored a mark on the first part for saying antibiotics or giving an example such as penicillin. The second part of this question was answered well with the majority of candidates relating the presence of thicker mucus to reduced levels of oxygen into the body and therefore reduced aerobic respiration.

Question 10

This question tested candidates' knowledge and understanding of movement of substances, enzymes and also their ability to interpret information given in a diagram.

(a) Almost all candidates gained the two marks here for linking the different process of transport to their definitions.

(b) In part (i) most candidates were able to draw a bell-shaped curve to gain two marks. However, a significant number only gained the first mark for showing that activity increased with temperature, but then draw a plateau instead of a decrease. In part (ii) most candidates showed a good understanding of how enzymes work and were able to relate this to the effect of pH. A few slipped into giving answers that referred to increasing temperature. A significant number of candidates gave examples of enzymes that work in the stomach in acidic conditions or those that work in neutral conditions. They however omitted to state how changing the pH would change their activity. In part (iii) most candidates gained at least one mark here. However, many candidates believe that the release of energy when ATP breaks down to ADP was part of respiration itself, rather than the energy from respiration being used to make ATP. Thus marks were lost where learners described the breakdown of ATP instead of the production of ATP.

Question 11

This question was centred on viruses. It tested candidates' knowledge of virus structure and their mode of reproduction. It also tested candidates' knowledge and understanding of vaccination as well as their data interpretation skills.

(a) Most candidates gained the two marks here for the identification of different parts of a virus and for stating that they reproduced within living cells.

(b) In part (i) most candidates gained the two marks here for correctly identifying an increase in the number of vaccines, followed by some further detail. The most commonly identified detail was a decrease in 2008 from 2007. In part (ii) most candidates gained at least one mark, usually for the idea of antibody production. Only a relatively few candidates made reference to the fact that the vaccine would contain dead viruses or antigens. In part (iii) many candidates missed the fact the antigens on the surface of virus change, but some correctly referred to mutation. Some candidates made reference to the fact there are different strains of flu, but without any amplification. A significant number of candidates gained no marks as they referred to memory cells and the fact that they only last a year.

Question 12

This question was about various aspects of homeostasis. Candidates were required to show their knowledge and understanding about mechanisms for temperature control and for the control of fluid in the blood. It also tested their ability to plan an investigation.

(a) The first part of this question was well answered by many candidates. Those that lost a mark were either able to correctly appreciate the process of evaporation but not describe the loss of heat as a consequence or vice versa. Both marks were awarded frequently to candidates as many were well answered. More specifically many candidates correctly referred to 'latent heat'. The second part of the question was also answered well, apart from where learners referred to 'air being trapped' instead of 'no layer of insulation'.

(b) Most candidates demonstrated a good understanding of ADH. Many extended the question to explain how and why it is released, then went on to explain its action in the kidney.

(c) A textbook definition that incorporated both points on the mark scheme was given by most candidates, with many gaining the two marks. Examples were also correctly used in many cases but were not awarded marks as this was not what the question was asking for. Those that were incorrect talked solely about the control of temperate or water.

(d) This question elicited a range of responses. The weaker candidates just referred to drinking more water and losing heat without describing an experiment at all. The better candidates gave reasonable ideas for an experiment although ways of measuring sweat was not always fully explored.

Question 13

This question was based on the circulatory system. It tested candidates' knowledge and understanding of the difference between arteries and veins, their application of knowledge regarding blood groups and blood transfusion and also their knowledge and understanding of the structure and function of tissue fluid.

(a) Most candidates gained one mark for the idea that blood flowed at higher pressure in arteries. Not so many candidates gave the reason why – that arteries came from the heart.

(b) This question gave rise to a range of responses. Some candidates were clearly confused by the use of antigen and antibody and also by which antigens appear in which blood groups. Often blood group A was said to contain anti A antigens! The better candidates however gave very clear and accurate answers that gained all 5 marks. Marks were lost by candidates who referred to genotype and phenotype of the blood groups and also to blood groups being recessive or dominant.

(c) Candidates were generally familiar of the role of tissue fluid, although some missed the marking point for the fact that tissue fluid surrounds cells, although it was implied in their answers. Most candidates were able to gain the full four marks.

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