

Examiners' Report/
Principal Examiner Feedback

Summer 2012

International GCSE
Human Biology (4HB0) Paper 02

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4HB0 02 Examiners' Report – Summer 2012

This was the third paper of the new International GCSE Human Biology Specification and it maintained a good transition from the old O level papers of the past. There was no evidence that there was insufficient time for candidates to answer the questions. One area of concern was the generally poor response of questions that related to experimental technique. It should be noted that this type of question is permitted and that candidates should be given plenty of opportunity to carry out experiments related to the statements in the specification. They should also be expected to apply their knowledge of experimental techniques to unseen situations.

Question 1

This question was based on the nervous system and allowed candidates to demonstrate their knowledge and understanding of neurone structure and functions.

(a) (i) Most candidates gained two or three marks, usually for myelin sheath and cell body/cytoplasm. Few gained the mark for the node of Ranvier with many putting axon instead.

(ii) Most knew motor nerve, but a few put sensory.

(iii) Most had the arrow going in the correct direction.

(iv) Most got sensory and relay, but some put motor despite being asked for two apart from motor.

(b) The majority of candidates scored two marks here, although some gave examples of parts of the reflex arc rather than its functions.

Question 2

This question centred on microorganisms, diseases and how they are spread. It was based on food poisoning.

(a) (i) This question discriminated well. Many candidates gained one or two marks, usually for the idea of reproduction and the fact that it takes time for bacteria/food to pass along the gut. Only a very few candidates appreciated that initially only small numbers of bacteria would be taken in.

(ii) This part was answered reasonably well, with many candidates knowing that the gut would be affected, in particular that not as much water would be reabsorbed.

(b) (i) Most gained the two marks here, although some did not mention that there would be less bacteria transferred to the food.

(ii) This question was not answered well, with many candidates wrongly stating that the bacteria would be killed. There were a few candidates, however, that did make appropriate references to enzymes working less efficiently or more slowly.

(iii) A significant number of candidates did not appear to understand this question and talked about differences in temperature in different parts of the fridge.

However, some candidates did gain one mark for reference to the meat containing bacteria. A few gained the two marks for realising that blood/liquid might drip on to other food if the meat was stored higher.

It should be noted that references to germs were not accepted in any part of the question. Candidates are reminded to use proper biological terms.

Question 3

This question was based around growth of microorganisms. It afforded the candidates the opportunity to demonstrate and apply their knowledge of experimental techniques.

(a) (i) This was a well-answered question with the majority of candidates gaining the two marks. Most gained them by referring to multiplying and by binary fission. Few candidates gained marks through the idea that colonies start by a single bacterium.

(ii) Many candidates gained the two marks here, although some did not make reference to the fact that the experiment would be affected.

(iii) Most had the idea to spread or distribute the milk evenly.

(iv) Many candidates got the idea of stopping other bacteria from entering, although some answers were very vague, e.g. talked about things or air entering. Some gained the mark by referring to the fact that it would keep the lids on. A significant number said that it would stop the bacteria from escaping but this did not gain credit, as it is not one of the key reasons for having lids.

(v) The question was not answered very well. Many candidates did not make reference to colonies and thus did not gain the mark.

(b) (i) Most, but not all candidates, correctly counted the colonies and thus gained the three marks.

(ii) Only the very best candidates gained the three marks here. Some gained one mark for the correct calculation of the average. Carry forward errors from the previous part were credited. A significant number left this answer blank, suggesting that candidates are not familiar with calculations.

(ii) Few candidates appeared to understand the question clearly. Some gained one mark for referring to the fact that the colonies could not be counted. However, very few gained the second marking point. The idea that each colony derives from one bacterium did not appear to be understood.

Question 4

This question was centred around the heart and related problems, particularly those caused by poor lifestyle.

(a) Most candidates knew that the function of the coronary artery is to supply heart muscle with food and oxygen. Some did not gain the mark as they did not refer to the muscle of the heart.

(b) (i) Almost all candidates gained the mark here for an appropriate answer, such as cholesterol, lipid or fat.

(ii) The vast majority of candidates answered this question well and gained two marks. Some, however, were not specific enough about factors such as diet. It was apparent that a few candidates did not understand the term risk factor as they talked about consequences, such as heart attacks.

(iii) This question was answered well with many candidates gaining three marks. The most common answers related to a lack of oxygen getting to the heart muscle resulting in a heart attack.

Question 5

This question was based on enzymes. It tested the candidates' knowledge and understanding of experiments based on factors that affect the rate of reactions.

(a) (i) A few candidates answered this question very well, but the majority did not appear to understand it. This highlights the fact that some candidates do not appear to have much experience of carrying out such experiments. Such candidates talked about repeating the experiment or physiological differences of enzymes in different parts of the gut instead of realising there were not many points around the optimum and thus it could be higher than pH 3.2.

(ii) This was answered very well with the majority of candidates correctly stating the stomach with an appropriate reason such as acidic.

(b) This question was answered well by most candidates. Many gained the three marks by stating that the enzyme would be denatured and then went on to state the effect of this on altering the shape of the active site such that the substrate could not bind. The less able candidates usually managed to gain one mark by mentioning denaturation.

Question 6

This question tested the candidates' knowledge and understanding of genetics. It was based on blood groups and their inheritance.

(a) (i) Most candidates gained the mark for correctly stating both blood groups. The most common incorrect answer was to have the child with an allele coding for blood group B.

(ii) The explanation for this part was often succinct and correct, gaining the three marks. At other times explanations were long-winded and confused. Many candidates appreciated that the child had to be homozygous (or words to that effect), but then simply stated 'so the father who is AB cannot be the parent' without further explanation.

(b) This part was answered well with many candidates gaining the four marks. Some lost the final mark as they did not make it clear which offspring genotype related to the phenotype blood group O,

(c) This question was answered fairly well, with many candidates gaining the two marks. Candidates expressed the idea of rejection in many ways and were given credit for this. Some candidates mentioned agglutination but were not specific enough to gain the rejection mark as well and only got the one mark. Marking points 3 and 4 were rarely seen with candidates not thinking through to the specific problems that rejection or agglutination might cause. This did not preclude candidates from gaining full marks though.

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