

Examiners' Report/  
Principal Examiner Feedback

January 2013

International GCSE Human Biology  
(4HB0) Paper 02

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## International Human Biology paper 4HB0 02

A number of candidates found difficulty in expressing themselves with clarity and in using the appropriate biological terminology. Candidates should read the whole of the question including all parts before attempting to answer and in that way would avoid what seemed to be a common error of answering a question with information that was applicable to a part of the question that came later.

### Question 1

In answer to part (a)(i), most candidates appreciated that the oxygen level falls, but few went on to mention that it later rises.

In part (a)(ii) many candidates described the whole process of eutrophication, which were not relevant, rather than focus on the role of bacteria. A common phrase was that 'bacteria feed on the sewage'. Clearly, such comments are biologically incorrect and candidates should be familiar with terms such as 'digest' or 'decompose'. The fact that the bacteria respire aerobically and so deplete the oxygen was well understood. Most candidates only scored one mark in answering part (b). This was because they understood that the number of fish would first of all decrease but, they drew the line before the fall in oxygen levels rather than as a lagging factor.

Part (c) was well answered.

### Question 2

Many candidates struggled with the correct spelling of bronchiole in their answers to part (a) and many gave a hybrid term that could have been taken for bronchi(us).

Although in answer to part (b)(i) candidates had little difficulty in identifying the heart, they found greater difficulty in naming the pulmonary vein.

Part (c) was answered well with most knowing that diffusion accounted for the movement of gas. However, there were many who had not learnt correctly the balanced equation for aerobic respiration and whilst many could include oxygen and water in the correct places, they could not give the correct number of molecules.

Part (d) quite clearly asks for reasons 'apart from having a large surface area' .... , yet many candidates insisted on writing 'large surface area' for their answers. Candidates, in some cases confused a thin wall of the alveolus with a thin cell wall. This is a common mistake and candidates are better advised in these circumstances to refer to a thin epithelium which is a better answer, rather than become involved in using the term 'wall' at all. The standard term of, 'dense network of capillaries' was not often seen. Instead, more vague references referring to blood or blood supply.

Many candidates found difficulty in the spelling of the word 'emphysema' in their answers to part (e). A few candidates selected lung cancer or asthma instead.

### Question 3

Most candidates drew four chromosomes in both cells in answer to part (a)(i) and (ii) though some, failed to show them of different lengths and some candidates only drew the haploid number despite the fact that the question states 'mitosis'.

Parts (a)(ii) and (iii) were well answered.

Although part (b)(ii) asks for a description of the effect of temperature on the *time* taken for cells to divide, a sizeable number referred to an increase in temperature increasing the rate of cell division. Most candidates failed to observe that the decrease in time became less as the temperature rose above 10°C.

### Question 4

In describing the role of the oesophagus, many candidates omitted to mention that the food travelled from the mouth, simply saying it went to the stomach. Many made reference to the movement of food by peristalsis. The answers to part (c) were usually good but, many confused the emulsification role of bile with digestion.

The commonest mistake in the answers to part (d) was to ascribe the role of digestion of carbohydrate to the enzyme maltase rather than amylase or carbohydrase.

Very few mentioned the role of the duodenum in passing the food onto the ileum in their answers to part (e). Many thought that the duodenum had a role in absorption of digested products. There was often a lack of an explicit statement to the effect that the duodenum received pancreatic juice/enzymes and received bile from the gall bladder/liver. Comments were often descriptions of what these secretions did.

### Question 5

Parts (a) and (b) were usually well answered, though many candidates thought that malaria is a disease caused by poorly constructed pit latrines. Although in their answers to part (c) candidates only had to draw information from the passage in order to secure the marks; many gave long descriptions including irrelevant material that had not been mentioned in the passage. The best answers referred to the safe securing of the pit latrine in order that cement was not cracked because this would provide an ideal location for hookworm larvae. Many candidates were confused over the size of the hole despite it being clear from the passage that it needed to be wide enough to avoid splashing. Instead, many candidates focused on the depth of the hole.

Again, answers to part (d) often made reference to the bacteria 'feeding' on the sewage rather than decomposing or breaking down of the sewage. Few made any reference to the activated sludge method.

## Question 6

The quality of graphs in part (a) was variable. Graph plotting will be required of candidates and they need to familiarise themselves with the correct techniques. Candidates should arm themselves with a sharp pencil and a rubber and draw lines with the help of a ruler. Often the axes did not have units or were not fully labelled. Candidates need to use most of the graph paper and not cramp their graphs into a third or less. Candidates should not extrapolate their lines beyond the plotted points either deliberately or accidentally, the use of a ruler would help to avoid the latter. In describing the pattern, most candidates failed to refer to the fact that the decrease in time was not uniform. Candidates must scrutinise results with a much more critical eye.

Answers to (b)(ii) usually managed to describe the digestion of the protein jelly by the enzyme though very few mentioned the increased number of collisions that would result from an increase in enzyme concentration. However, fewer then went onto to say that this would result in the paste becoming more liquid as the products of the protein digestion would be soluble amino acids.

The answers to part (c) were poor and, in many cases, ill considered. The investigation is into the effect of enzyme concentration on the rate of flow so, to suggest as did many candidates that the enzyme concentration should be kept constant, is ludicrous. The commonest correct answer was pH. However, many candidates referred to the 'amount of enzyme'. Reference in this context should have been to the same *volume*. The term amount should not be used in any reference to a quantity.

The concept of reliability was not well understood. When candidates suggested that the experiment should be repeated they only wanted to use the additional data to compare or to discard anomalous results. Very few candidates appreciated that in comparing results the test of reliability was to see if the results were identical or very similar, in that way the results could then be said to be reliable.

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