

Examiners' Report/  
Principal Examiner Feedback

Summer 2013

International GCSE  
Human Biology (4HB0) Paper 02

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## International Human Biology 4HB0 02

Some students experienced problems with questions which required the application of knowledge and understanding as they found it difficult to express themselves in a coherent manner. There was still a lack of understanding of osmosis, this was particularly disappointing as reference has been made about this in the past.

Students must use the mark allocation indicated on the paper to guide them as to how many separate points need to be made in order to answer the question fully. Lack of knowledge and use of appropriate terminology continues to be an issue.

### Question 1(a)

This was usually well answered though a not uncommon error was to simply refer to B as the 'wall'.

### Question 1(b)

Most students gained some marks here but some did not attempt both parts of the question, for example only describing the differences without explaining why they happened.

Many students went into great detail about hormone levels rather than describing differences in the reproductive system itself. Some think that the ovum is released at the start of the cycle and that the uterus lining would therefore be thicker in the first 3 days to prepare for implantation.

Many referred to the uterus wall being lost rather than the lining. There was little use of the term endometrium.

### Question 1(c)

Most students answered this well. There were some unusual descriptions of fertilisation, for example the sperm "fertilises with" the ovum.

There was some confusion between the term ovum and ovary. Several students stated that the sperm fuse with the ovary.

### Question 1(d)

Although many students recognised that fertilisation would not take place they failed to mention that the sperm and the ovum could not meet because of the blockage. Too many stated that the ovum would not be released. Only a minority mentioned the term 'infertile' instead commented about not being able to get pregnant.

In part (ii) the majority made a correct reference to the use of a condom, although some students referred rather vaguely to 'safe sex'. However, only a minority made reference to the condom preventing the mixing of body fluids which is the means of transfer of the infective organism. Many said that the sperm transferred the organism.

### Question 2(a)

The majority of students were able to score two or three marks but common errors included repeating the names of pieces of apparatus already given in the stem of the question and the use of incorrect names for pieces of apparatus.

### **Question 2(b)**

Common errors included suggestions that the pH should be kept the same or that the temperature should be kept the same. Those students who recognised that the volume/mass of the egg white should be kept constant were usually able to give an appropriate reason.

### **Question 2(c)**

The majority of students understood what the expected results of this experiment would be. However, they tended to lose marks by not following the example given to fill in their tables and as a result not specifically stating "not boiled" or "nothing added". Those who didn't get full marks on this question often scored just 2 marks for correctly describing tubes D and E which were the only 2 that didn't require the use of one of these terms.

### **Question 2(d)**

Many students simply quoted the results of the experiment rather than applying the results. A simple reference to the pepsin acting in digesting the protein better in acid conditions was expected. However, many students made reference to 40°C being the optimum temperature for pepsin. It is not possible to conclude that from the results of the experiment.

### **Question 3**

There were some really excellent answers to this question showing a detailed knowledge of control methods. However, a large number of students wrote in detail about the life cycle of *Schistosoma* and the symptoms of the disease gaining them no marks and then very little about methods of control. Many seemed to have confused control methods for Schistosomiasis with those for Malaria, for example, referring to spreading oil on water to suffocate larvae, using Tilapia to eat larvae, references to a protozoan parasite and using insecticide to kill the snails. A number of students thought that the snails bite.

### **Question 4**

The majority of students were able to draw the liquid levels correctly for part (a), although a fair number got this the wrong way round. Some didn't draw any change in liquid levels but instead drew sugar molecules in the distilled water. In part (b) many just regurgitated a standard definition of osmosis. Few went on to explain that it would cause volume changes and, therefore, lead to the change in the levels. Some thought that the sugar was not already dissolved in the water and stated that it would dissolve and then would be able to pass through the membrane. Some students gave very clear answers using the term water potential, others, who used the term concentration, got very muddled. Many described diffusion rather than osmosis and thought that the question was all about sugar diffusing. These students tended to talk about regulation of blood glucose as their answer to part (c).

There were very few really good answers to part (c). Many had just learned the definition of osmosis but couldn't relate this to practical applications. There were lots of vague statements about keeping 'the levels in the blood constant'. Surprisingly few described osmosis as the way water enters cells. A considerable number referred to water re absorption in the kidneys (with a

number demonstrating knowledge of the action of ADH on the permeability of the collecting ducts).

A number of students confused osmosis with diffusion and talked about diffusion of gases in the lungs as their answer to part (c)

### **Question 5(a)**

Many students recognised that a mutation was caused by a change in something. However, many confused gene with allele and very few went on to describe the effect of a mutation in causing the production of a different protein or a different characteristic.

In part (ii) a large number described the effects as preventing the secretion of insulin and the inability to control blood glucose levels, showing a complete lack of understanding of the nature of an endocrine gland. A sizable number suggested that the blockage would prevent the production of pancreatic enzymes rather than their inability to pass to the duodenum.

### **Question 5(b)**

This question was mostly well understood. Students should be reminded of the need to make their upper and lower case letters clearly different as it was often quite difficult to tell them apart. Some thought CF was sex linked but most got the diagram correct. The most common reason for losing a mark in part (b)(i) was forgetting to identify the phenotypes. Most followed the clear instructions to use the letter F but a few used other letters. Most students correctly answered part (b)(ii) with a few losing the second mark by giving the chances of a having a child with cystic fibrosis rather than one that does not have, as the question stated.

### **Question 6(a)**

Most students were able to correctly identify the two types of joint though a common mistake was to describe one or other as a synovial joint and to describe the ball and socket joint as a freely moveable joint.

### **Question 6(b)**

Most students understood which muscle contraction would bring about which movement but were sloppy in their description of it – using the word arm rather than forearm. Very few referred to the triceps being stretched.

### **Question 6(c)**

Those who recognised that this question was about missing cartilage generally had a very good knowledge of its function. A number of students talked about the joint as missing 'a' cartilage rather than just cartilage. A number, however, thought that the problem was that the joint had too much synovial fluid and was swollen and a fair number seemed to think that ligaments were damaged or missing.

## **Grade Boundaries**

Grade boundaries for this, and all other papers, can be found on the website on this link:

<http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx>

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