

Examiners' Report/  
Principal Examiner Feedback

Summer 2012

International GCSE  
Biology (4BI0) Paper 2B

Edexcel Level 1/Level 2 Certificate  
Biology (KBI0) Paper 2B

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## **4BIO & K BIO (2B) Examiners' Report – Summer 2012**

It was highly unusual to find an item that had not been attempted which indicated that candidates found all the items accessible.

### **Question 1**

The comprehension was about diet in children and tested understanding of vitamins, balanced diet and energy balance. In part (a), most appreciated that spending time outdoors allows sunlight to make vitamin D and so reduce the chance of getting rickets. Those who thought sunlight contains vitamin D were not credited. Part (b) was more challenging, but about 60% appreciated that children are still growing which is why a vitamin D deficiency would cause a problem, particularly with bone development. Those who did not read the question carefully wrote about the time children spend indoors or commented on the amount of cod liver oil they take. Most candidates were able to list three other components of a balanced diet in part (c). In part (d), a pleasing number of candidates appreciated the energy balance implications of eating foods rich in carbohydrates and fats and not using the calories due to hypoactivity. Then, in part (e), many were aware of the health risks of a high fat diet in causing obesity, cardiovascular disease and diabetes. Part (f) required candidates to write about a practical procedure listed in the specification. Those who had carried out the practical were able to recall many of the points allowed in the mark scheme. However, it was clear that some candidates had no idea what was required to find out the energy value of a food sample.

### **Question 2**

This question was synoptic and tested understanding of how viruses cause disease and how the body defends itself. The question was well answered by most candidates. Naming the acid as nucleic acid posed difficulty and wrong answers such as lactic or amino were often seen. Another common error was to name lymphocytes rather than antibodies as the proteins produced to help destroy pathogens.

### **Question 3**

This question explored events in the body of a female linked to reproduction. The correct answer in part (a) (i) was 15 days but it was not uncommon to find the incorrect answer of 14 days. These candidates most probably failed to see the temperature of 36.9 on day 28 in the table. Days 14 or 15 were accepted in part (ii) and most gained candidates credit. A pleasing number understood the term 'accurately' in part (iii) and mentioned that a thermometer needed to be digital or clinical and that it needed to be placed in a part of the body that most closely reflected the true body temperature. In part (b) (i) and (ii), only the least able candidates failed to name oestrogen and progesterone correctly. Occasionally these hormones were listed in the wrong order, and sometimes FSH and LH were incorrectly named. A surprising number of candidates seem unaware that hormones travel in the blood to their target. As such, answers to part (iii) were disappointing. The examiners believe this might be another example of students

not reading the question carefully because the term 'oviduct' was often chosen, presumably candidates thinking that the question was asking how the 'egg' travels from the ovary to the uterus. Candidates did very well in part (iv) with almost 70% gaining two marks.

#### **Question 4**

This question examined knowledge and understanding of genetic modification and cloning. Many candidates were able to recall the names of the enzymes involved in parts (a) (i) and (ii), though the examiners noted that the spelling of restriction and ligase was often incorrect. Candidates were still credited but are encouraged to try to spell biological terms correctly. Less than half the candidates were able to recall the name of a vector in part (iii) as a plasmid or a virus. Those who wrote 'bacteria' alone were given no credit. In part (b), the examiners only gave credit for answers that showed that the gene being transferred came from a different species, not animal or organism. Part (c) posed problems for many candidates. Many failed to produce answers that discussed the transgenic sheep in the question. Listing the sequence of events involved in cloning failed to gain credit as did general responses discussing the benefits of transgenic techniques or cloning. The examiners rewarded candidates who understood that the advantages of reproducing the transgenic sheep by cloning are that there would be lots of genetically identical sheep producing lots of the factor IX and that there would be no need to repeat the GM procedure. In part (d), most appreciated the role of platelets in blood clotting and that loss of blood is prevented, as is entry of pathogens.

#### **Question 5**

This question explored aspects of the human heart and was answered well by most candidates. An anomalous result is one that does not fit the pattern and in part (a) (i) the answer the examiners rewarded was student 8. This was the only student who did not show an increase in heart rate having been frightened. Part (ii) posed little difficulty with most candidates appreciating that the heart rate increases when frightened and almost 50% read the question carefully to offer adrenaline release as the explanation. Answers to part (iii) showed that only the best candidates understand that for results to be reliable they must be repeated and show a similar pattern. Many answers referred to the concept of validity and gained no credit. Part (b) discriminated well and also showed that many candidates fail to read questions carefully. For example, the correct answer to 'the chamber that pumps blood to the lungs' was the letter A, but D was often chosen. The examiners believe these candidates chose the vessel not the chamber. A similar error occurred with 'the blood vessel containing blood at the highest pressure'. Many chose the letter H instead of the letter E.

### **Question 6**

This question examined understanding of the nitrogen cycle and energy transfer. In part (a), the better candidates understood that nitrification involves nitrifying bacteria converting ammonium into nitrite or nitrite into nitrate. However, many candidates did not understand what the term nitrification means and believed it to be a catch all term for all the processes in the nitrogen cycle. These candidates wrote about nitrifying bacteria, nitrogen fixing bacteria and denitrifying bacteria and duly lost credit. Many candidates failed to read part (c) carefully and wrote about movement and heat loss in their answer. The examiners were looking for answers that showed an understanding of the reasons energy is not transferred from the producer trophic level to the primary consumer trophic level.

### **Question 7**

This question was well answered with 41% of candidates gaining full marks. This demonstrated that candidates have a good understanding of the consequences of cigarette smoking on the human lungs. Again, some candidates failed to read the question carefully and wrote about the biological consequences to the human cardiovascular system. The examiners rewarded answers that discussed emphysema, bronchitis and cancer.

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