



Examiners' Report

Principal Examiner Feedback

October 2017

Pearson Edexcel International Advanced  
Level Biology (WBI05) Paper 1

Energy, Exercise and Co-Ordination



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## **Introduction**

Students were able to demonstrate their knowledge and understanding by tackling the wide range of questions offered in this paper. It was clear that some students had studied the pre-release article and were able to relate their reading to the questions asked in a meaningful way. However, many students appear to have struggled with aspects of the paper and, in particular, with the scientific article.

Some students attempt to "set the scene" before beginning their actual response, often merely repeating the words in the actual question. This wastes valuable time and gains no credit.

Incorrect interpretation of the wording of some questions was apparent in a number of questions and many students appeared to struggle to apply their knowledge to the unfamiliar scenarios that were presented.

### **Question 1(a)(ii)**

Many students managed to express the idea that by not responding to humans the prairie dogs conserved energy (MP1). However, relatively few students went on to explain why this was important so did not gain a second mark from marking points 2 or 3.

### **Question 1(b)(ii)**

Marking points 1 and 4 were frequently seen. Few students gained marks for marking points 2 or 3. The idea that rats would be badly treated or simple statements that the use of rats would be unethical were not accepted.

### **Question 1(c)**

This question was about the nature of the stimulus and not about the molecular events in neurones or at synapses. Students who provided answers in the relevant context generally gained both marks for marking points 1 and 2. A few students also made reference to the strength or type of stimulus (MP3).

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

This was a straightforward question for most students. However, a number confused keyhole with kneehole and did not gain mark point 1. Marking points 1, 2 and 3 were most frequently seen.

### **Question 3(b)(i)**

Most students made a reasonable attempt at this question. However, they often started by describing the events at the synapse (MP3) and the initiation of an action potential in the post synaptic neurone (MP4). Very few made a clear reference to the role of neurotransmitters transmitting nerve impulses across the synapse because action potentials can't cross the synaptic gap (MP1 and 2).

### **Question 3(b)(ii)**

This question was problematic to many students. Marking point 1 was seen on a number of occasions but marking points 2 and 3 were only seen infrequently. Students need to be able to apply their understanding to make sensible suggestions when answering questions like this one.

### **Question 3(c)**

Some complete answers were seen in which students had engaged with the context of the question. Unfortunately, many students produced answers that were not in the context of the question. As a result, marking point 1, 2 and 5 were only infrequently seen.

### **Question 4(a)(i)**

Students who read the question carefully generally gained both marks. A disappointing number of students calculated the decrease in heart rate rather than the actual heart rate and gained no marks.

### **Question 4(a)(ii)**

Students often gained two or three marks for this question (from MP1, 2 and 3). Marking point 4 was sometimes seen. However, students often suggested that action potentials or nerve impulses spread out from the SAN and this was not accepted for Marking point 4.

### **Question 4(b)**

This question was generally well answered. Students failed to get the mark if they did not refer to the generation of heat. Ideas around keeping warm or increasing temperature were not credited.

### **Question 4(c)(i)**

This question was answered well. Students are generally able to describe straightforward results, presented in graphs and tables, well. However, students do need to read questions carefully, in responding to this question credit needed to describe of muscle changes in the hibernating squirrel.

### **Question 4(c)(ii)**

Many students answered this question well. However, the question asks about structural differences, so descriptions of different appearance or physiology did not gain any credit.

### **Question 4(c)(iii)**

Many students appeared to not understand what was required to answer this question. Several students described hibernating squirrels as not needing to hunt or moving less and so not needing slow twitch fibres. These responses gained no marks. Few students recognised that there would be a reduced oxygen supply and that fast twitch muscles respired anaerobically (MP1 and 2).

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

Students struggled to provide a good description of what is meant by homeostasis. Incomplete descriptions or descriptions limited to temperature were frequently seen. The response needed to describe the regulation of an organisms internal environment. Regulation of an organisms environment was not accepted and answers restricted to maintaining an organisms temperature were ignored.

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

This was a straightforward question for many students. Marking point 1 was sometimes missed if students did not refer to water. Marking point 2 needed reference to both 1-4 and 1-6 glycosidic bonds.

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

Few students produced good responses to this question. Many students simply described the information provided in the table and gained little credit. To gain marks, students needed to use the information in the table. Marking points 1 and 2 were for simple statements about need for increased ATP production and loss of water or sodium by sweating. For ACTH, glycogen and insulin students had to link hormone effect to glucose concentration in the blood. For aldosterone and ADH, students needed to link retention of sodium and water to counter the loss of these substances via sweating.

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

A number of complete responses were seen, with students gaining all four available marks. However, many students produced limited responses that did not engage with the context of the question. Often students simply described transcription factors binding to a specific region of DNA (MP3) and regulating transcription (MP4). Very few students addressed the idea that transcription factors can turn off transcription of some hormones (MP5 and 6).

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

This was a straightforward question and students familiar with the topic generally produced good responses that gained all five available marks.

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

In this question students needed to apply their understanding of the role of phytochromes in the response of plants to light. To gain full marks students need to relate their biological understanding to explain the data provided. Many students made a reasonable attempt at this and scored highly. A number did not refer to phytochrome and did not gain marking point 2. Relatively few students attempted a full explanation of the data often ignoring the effect of a flash of light on flowering.

### **Question 7**

Relatively few students performed well across question 7. This suggests that students did not successfully engage with the pre-released scientific article. Students need to spend a significant amount of time working with the scientific article in order to be able to perform well in this paper.

### **Question 7(a)**

Many students gained one mark, usually for marking points 1 or 2. However, relatively few put relevant ideas together to gain two marks.

### **Question 7(b)**

A disappointing number of students were unable to provide an explanation of the meaning of autoimmune disorder.

### **Question 7(c)**

This question was straightforward and accessible to most students

### **Question 7(d)**

Very few students were able to clearly distinguish between a genetic predisposition and a genetic disorder. For genetic disorder, students needed to make reference to a mutation or faulty allele (MP2). A statement such as 'a genetic disorder only involves genes' was not accepted for marking point 2.

### **Question 7(e)**

Few students did anything more than copy ideas across from the article. For marking point 1 students needed to describe the transfer of pathogens or a named pathogen. For marking point 2 students needed to describe a particular mode of transmission.

### **Question 7(f)**

Although some good responses were seen many students produced incomplete or confused answers. Students tended to put viruses together with bacteria and suggest they caused damage in the same way. Few students successfully linked damage to cells and tissues to the symptoms of an infection.

### **Question 7(g)**

To answer this question students needed to explain the requirement for oxygen during exercise. Many students simply described the role of oxygen as the terminal acceptor of electrons (MP4) in oxidative phosphorylation (MP3), ignoring the reason for an increased oxygen demand (MP1, and 2). Very few students made reference to idea of allowing the electron transport chain to continue to function (MP5) or mentioned oxidation of reduced NAD (MP6).

### **Question 7(h)**

Many students scored well on this question. However, they often gained their marks towards the end of their response. The question is about design of a clinical trial. Many students described phase I, II etc for which no credit was gained. The question is about designing a trial to determine effectiveness of antioxidants. Students were not required to describe how an effective does or side-effects can be identified.

### **Question 7(i)**

The concept behind this question was that enzymes are specific because of their active site while non-enzymatic antioxidants will be less specific.

### **Question 7(j)**

Many students gained marking point 1 but few clearly expressed the idea required for marking point 2. Students should be aware that many factors other than exercise affect immunity (MP1) and recognise that in the studies described the type and extent of activity are not clearly described (MP2).

### **Question 7(k)**

Many students produced responses in terms of the different axis labels. In these responses students suggested the different graph shapes were the result of measuring 'risk of infection' and 'infection rate'. These responses gained no credit. Students needed to recognise the different groups on the x-axis and explain why these changed the shape of the graph.

### **Question 7(l)**

Many students recognised that bone marrow contained stem cells mp1 and some were able to link stem cells to the production of particular blood cells (MP3). Very few students suggested that the stem cells in bone marrow were pluripotent.

## **Paper Summary**

The paper gave students the opportunity to demonstrate their knowledge and understanding; their ability to apply this knowledge to unfamiliar scenarios; and their ability to draw together links between different areas of the specification.

Based on their performance on this paper, students should:

- Look closely at the number of marks allocated to each question and equate this to the number of ideas or points presented.
- Use precise, scientific terminology of an A level standard.
- Read the stem of the question closely before committing an answer to paper.
- Understand that simply repeating the stem is unlikely to gain any credit.
- Show workings in calculation questions to avoid losing marks.
- Understand that the command word 'explain' requires a biological rationale in the answer and not simply a description.
- Show how data has been manipulated where required instead of simply quoting figures from a graph or table.
- Use time management sensibly.
- Have a greater appreciation of the scientific method, in particular the design of experiments.

## **Grade Boundaries**

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<http://qualifications.pearson.com/en/support/support-topics/results-certification/grade-boundaries.html>



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