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Examiners' Report

Principal Examiner Feedback

January 2018

Pearson Edexcel International Advanced  
Level In Biology (WBI01) Paper 01 Lifestyle,  
Transport, Genes and Health

edexcel 

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## **Introduction**

This paper tested the knowledge and understanding of the two AS topics: 'Lifestyle, health and risk' and 'Genes and health', together with elements of How Science Works. The range of questions provided plenty of opportunity for students to demonstrate their grasp of these AS topics. Overall, students coped extremely well with this paper, finding most of the questions straightforward to tackle; there were very few examples of questions not being attempted at all, with all questions achieving the full spread of marks.

It was good to see how well many students could recall several areas of the specification in a good level of detail, including the core practical for measuring vitamin C concentration. It was also very pleasing to see few students losing marks for poor quality of written communication (QWC) with answers often set out in a logical style with good expression of clarity.

Some students let themselves down by not reading the questions carefully enough, or by providing a response without the detail required at this level.

It was also noted that several students simply wrote everything they knew about a given topic, therefore wasting time. It is suggested that students look carefully at the maximum number of marks available for each question and structure their answers accordingly.

Many students have clearly made good use of past papers and mark schemes, but it is important for students to understand the scientific principles covered in the specification so they can apply them to new contexts and not write a rehearsed answer to a question that has been asked in the past.

### **Question 1(a)(i)**

The majority of students gained this mark.

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

The majority of students gained this mark.

### **Question 1(b)(i)**

A variety of calculations were seen here. Over half of students gained 2 marks.

### **Question 1(b)(i)**

The majority of students gained this mark.

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

Many students gained 2 marks. However mp1 was often lost for simply referring to "pumping blood" and for mp2 there was a tendency to talk about SA/V ratios or large distances, without relating this to limitations of diffusion.

### **Question 2(a)**

This question proved to be a good discriminator across the ability range.

The majority of students stated that ventilation and blood flow helped to maintain a concentration gradient. Fewer related this to the alveoli.

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

Many excellent responses were seen for this question. Responses addressing all five marking points were frequently observed. Some students failed to express their ideas clearly. This often resulted in them not being awarded marking point 2 or 7.

This was a QWC question with an emphasis on logical sequence. The QWC penalty was rarely used. This has been a common question on past papers and it was clear that students had learnt the sequence of events and hence most gained mps up to mp6. Fewer were able to go on to describe the consequence of thicker mucus on gas exchange and many talked about cilia and bacteria and infections instead.

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

This question asked students to compare somatic with germ line gene therapy. It was poorly answered with very few scoring 2 or 3 marks. This seemed to be due to the lack of ability to compare, so students made a correct statement about one type but not the other and hence could not be awarded the mark. A lot of answers talked about the legality, ethics and cost of the therapies which were not creditworthy responses. The most commonly awarded mark was mp4 for reference to therapy being temporary or permanent.

### **Question 3(a)(i)**

This question was well answered.

### **Question 3(a)(ii)**

This question was well answered.

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

Few students scored full marks here-most commonly mp1 and 2 for correctly identifying the trend between cholesterol levels and incidence of CVD and systolic blood pressure and incidence of CVD. There was a general appreciation of the fact that CVD was highest above 21.2kPa, but not that it increased the most here. Similarly a large number of students simply quoted data from the table rather than choosing two relevant figures to manipulate and link to mp1 or 2 to support their statements.

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

This question proved to be a good discriminator across the ability range. Students that recognised the question was asking how atherosclerosis might lead to coronary heart disease often gave complete responses that gained four marks. Unfortunately, a disappointing number of students simply described the process of atherosclerosis and made no attempt to link this to a named CVD and hence could not access marking points 6 or 7. There was a mistaken reference to endothelial and artery walls from several students. Many also referred to "narrowing of blood vessels" only rather than arteries.

### **Question 3(b)(iii)**

Students were asked to name two treatments for CVD and a risk for each. The majority gained full marks. A small number incorrectly referred to surgical procedures.

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

A pleasing number gained all 3 marks here. However some then went on to describe the whole process of translation or misread the question and described the sequence of events occurring from primary to tertiary structure and therefore wasted valuable time.

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

Most students gained both marks for this calculation.

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

A pleasing number of students gained full marks and were able to describe the blood clotting process in detail.

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

This question was a good discriminator across the ability range with most correctly gaining mp1 for a description of primary structure. Fewer related this to solubility or the fact that albumin is globular and so did not gain marking points 4 or 5. Some simply referred to shape rather than 3D shape and so lost mp4.

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

Most students answered correctly.

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

Few students were able to work out this calculation on membrane thickness correctly. Historically such questions are not well answered which suggests that this is an area which students should concentrate on with reference to past papers and mark schemes.

### **Question 5(b)(i)(ii)and (iii)**

This question asked about a variety of transport mechanisms but was presented in the context of a table with named substance and relative concentrations of each inside and outside of the cells.

It was highly pleasing to see that students could use this data well and relate it to their knowledge base. Scores of a maximum 2/2/2 were very common. More able students were also able to talk about the role of carrier proteins in detail in part (ii) of the question.

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

Well answered though some incorrectly talked about a sequence of amino acids in DNA, or said this coded for an organisms phenotype rather than linking it to the formation of a certain protein.

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

Many students answered correctly.

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

Many students answered correctly.

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

Students were give information about a genetic disorder, SMA, in the stem of the question and then asked to draw suitable genetic diagrams. This proved to be an excellent discriminator across the range of abilities. A very low number recognised that there were two possible crosses here and hence were limited to gaining 3 marks only. Some students drew a correct Punnet square but then stated the probability as a ratio and hence lost mp5.

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

Many students answered correctly. Only a small number incorrectly stated amniocentesis.

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

Few gained both marks. Many stated that vitamin C itself was polar without reference to hydroxyl groups.

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

This question showed a line graph of vitamin C intake and relative risk of CVD in both genders. Many were able to access 2 or 3 marks most commonly marking points 1, 2 and 3.

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

This question was a QWC with an emphasis on clarity of expression. It was based on the vitamin C core practical, a question which has appeared several times on past papers. Many students were able to score all 5 marks with answers of a high standard. Common errors included stating that DCPIP was blue-black, preparing a solution rather than an extract and measuring the time taken for a colour change to occur in the titration.

### **Question 8(a)**

Many students gained full marks. However, some mentioned amylose and/or amylopectin, hence were referring to starch and subsequently lost marks.

### **Question 8(b)**

Marking point 2 was not awarded for the suggestion that glycogen is easily hydrolysed. To gain the mark students need to refer to the idea that glycogen can be rapidly hydrolysed, 'easily' was not accepted as being equivalent to 'rapidly'. To gain marking point 3 students need to make it clear that it was energy could be released quickly-not easily or in large amounts. Many students gained marking point one for stating that glycogen was branched.

Many good responses were seen for this question. However, responses addressing all three marking points were not frequently observed. Some students failed to express their ideas clearly. This often resulted in them not being awarded marking point 2 or 3.

### **Question 8(c)(i)**

A pleasing number of students gained both marks and were able to correctly identify the correlation in data and describe a change in rate at higher concentrations. A noticeable error for marking point two was that the rate slowed down which we did not accept. Many were able to carry out a correct manipulation of data from the graph.

### **Question 8(c)(ii)**

This was a higher level question in terms of cognitive demand and very few students scored more than two marks. Many identified that the substrate was limiting at higher concentrations and that increasing enzyme concentration increases the number of active sites. There was reference to more collisions occurring, but the mark was only awarded in the context of rate.

Marking point 2 was not awarded for the suggestion that glycogen is easily hydrolysed. To gain the mark students need to refer to the idea that glycogen can be rapidly hydrolysed, 'easily' was not accepted as being equivalent to 'rapidly'. To gain marking point 3 students need to make it clear that it was the storage of large quantities of energy or glucose in a small space. Simple statements that 'glycogen is compact' were not sufficient to gain the mark.

## Paper Summary

Based on their performance on this paper, students are offered the following advice:

- Read the whole question carefully, including the introduction, to help relate your answer to the context asked. You should read the question through carefully at least once and then write down your knowledge and understanding in a way that answers the question.
- Read your answers back carefully – do they answer the question, have you made at least as many clear points as marks are available.
- When asked to distinguish between two things make sure your answer is comparative and mentions both things being compared.
- When asked to describe data, either graphs or tables, look first for the main trends i.e. the overall changes and describe these. You need then to make a judgment about the usefulness of any mathematical manipulation of the data and this should only be carried out if it adds value to your written description.
- Do not be afraid to include a sketch diagram or graph if it will help add clarity to your answer.
- When describing the measurement or control of variables, be specific about what is to be measured e.g. volume or mass and avoid vague terms such as amount.
- Pay particular attention to the use of technical names and terms, a logical sequence and organisation of your answer in QWC labelled extended writing questions.
- Use past papers and mark schemes to ensure understanding of questions involving magnification calculations.
- Pay particular attention to the number of marks available for each question and structure answers accordingly.

## Grade Boundaries

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

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