



# Examiners' Report Principal Examiner Feedback

January 2019

Pearson Edexcel International Advanced Level  
In Biology (WBI11) Molecules, Diet, Transport and  
Health

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### **Question 1**

Candidates responded very well to all five multiple choice questions and the majority knew that monosaccharides are joined together by a condensation reaction.

### **Question 2**

The multiple choice at the beginning of this question caused few problems.

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

Candidates were generally able to describe the link between cholesterol and heart disease. A good number were also able to distinguish between the two cholesterol types and identify that LDL was the main risk factor or that HDL was not a risk factor. A few higher quality responses referred to the balance or the ratio between HDL and LDL as being important in determining the risk.

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

Candidates in general were able to identify an increase in the risk due to smoking for mp1. Many were also able to relate smoking to an increase in blood pressure or endothelial lining damage for mp2. Only a small number of quality responses generated mp3 by correctly and clearly referring to lining damage contributing to plaque / atheroma / blocking of arteries OR to high blood pressure making the heart work harder, in order to gain full marks.

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

There were plenty of alternatives here for candidates to score the mark and the vast majority did. The most popular responses were references to exercise levels and then BMI, followed by obesity, alcohol intake and family history.

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

The majority of candidates were able to score the mark here with a wide range of alternatives to choose from. Generally, responses included the correct effect. However, in a number of cases candidates referred to people changing their habits in the future, which was not appropriate, as the risk is about the time they entered the data into the risk calculator.

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

Most candidates identified the fact that there were other risk factors which were not included, in order to gain mp1. However, the majority were not able to gain mp2 and clearly state why there would be an underestimation, with only a small number of quality responses able to do so. Very few latched on to the idea of the estimation of cholesterol or blood pressure.

### **Question 3**

There were a wide range of diagrams seen in part a. A number of diagrams showed two mononucleotides joined together by hydrogen bonds between the bases. Although this diagram could have scored mp2, few did, as candidates did not draw the two strands anti-parallel to one another meaning that one of the bases was joined to carbon 4.

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

Few candidates appreciated that there would be nine spaces between 10 base pairs so divided by 10 and not 9.

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

A wide range of responses were seen. Both mark points were equally seen but only the more able candidates looked at the mark allocation or the question carefully and realised that two points must be needed to fully answer the question.

It was pleasing to see that many candidates had been taught that 'compare and contrast' requires candidates to give both similarities and differences, and as matched pairs. There were some good responses that demonstrated good knowledge of RNA structure. The less able candidates tended to write everything that they knew about transcription and translation or else wrote two separate descriptions of the RMAs' structure.

### **Question 4**

A number of candidates responses failed to read the question for part a carefully enough and described the supply of oxygenated blood to all body cells by the aorta. The better responses gained mp1 and/or mp2, with fewer gaining mp3. A number of responses referred to oxygenated blood going to the heart and failed to refer to heart cells/muscle or tissue. In some cases there was no reference to oxygen or oxygenated blood.

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

Was extremely well answered with the vast majority of candidates being able to identify the stage of the cardiac cycle and give a correct reason.

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

Was answered well in general, with the majority of responses gaining all three marks. There were some carelessly drawn arrows which cost some candidates marks; candidates should be encouraged to ensure that all diagrams are carefully drawn.

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

Many candidates were able to indicate the relationship between the increased diameter of the aorta and the increase in blood volume or the high blood pressure for mp1. A reasonable, but small number gained mp2 for expansion or stretching of elastic fibres, but responses often failed to mention that the expansion was due to the elastic fibres, vaguely referring to the aorta walls. A slightly larger number of responses correctly stated that the decrease in diameter was due to recoil. The less able candidates simply described the changes shown in the graph.

### **Question 5**

As with the other maths questions, the one in part ai caused few problems to the more able candidates but were found to be challenging by the less able candidates. There was a consequential error for the relatively high number of candidates who substituted the diameter value into the equation and not that of the radius.

The responses to part aii were disappointing. Those candidates who did score a mark were those who wrote a description and not an explanation and therefore were awarded the additional guidance mark.

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

Many candidates recognised the relationship between cholesterol and permeability, and temperature and permeability. Very few appreciated that a third point was needed for full marks and failed to comment on the non-linear relationship between permeability and cholesterol.

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

Candidates had a good understanding of the effect cholesterol on permeability but surprisingly few candidates could explain why an increase in temperature increased permeability. Quite a few candidates talked about the high temperatures melting the phospholipids.

## **Question 6**

As a result of the way that the diagram in part had been drawn, there were two ways that an estimate could be made, resulting in different ratios. Our mark scheme allowed for this.

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

There were a number of candidates who were able to state that there was no effect on the total membrane phospholipid content. However, many candidates had difficulty making statements about the distribution of phospholipids for mp2. On the smaller number of responses when this mark was gained, it was usually for a simple statement about general phospholipid content change (increase or decrease) in the outer and inner layer. Very few actually referred to the effect on the concentration of phospholipids other than phosphatidylserine.

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

Very few responses referred to an alteration of membrane properties, permeability or fluidity, thus failing to gain mp1, this limited the number who gained full marks on this question. However, there were some very good responses gaining three marks for the other marking points. Most responses were able to refer to thromboplastin as an enzyme or catalyst for mp3 and also to this being responsible for the conversion of prothrombin into thrombin for mp4. The better responses also clearly stated that thromboplastin was released from platelets. However, a common error was to omit the reference to platelets. In a number of responses there was irrelevant discussion of fibrinogen, fibrin and clotting, with candidates simply writing down everything that they had remembered being taught.

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

It was surprising to see that a significant number of candidates failed to state that thrombin was an enzyme for an easy mp1. There were also few responses referring to changes in the active site or to thrombin not being able to bind to fibrinogen because of this. We can only assume that candidates had failed to pick up on the key word 'inhibitor' in the stem of the question. Those who had, commonly talked about inhibition of thrombin production. Most responses picked up on mp4 for less fibrinogen being converted into fibrin, with either mp1 for recognising thrombin was an enzyme or mp2 for describing the lack of a mesh/fibrin/fibres to trap blood cells or platelets. The best responses usually had mp1, mp4 and mp5. It was rare to see maximum marks for this question, but there were a small minority who did.

## **Question 7**

An interesting range of responses were seen for part a. Quite a few candidates suggested that the insects needed to be removed as they would eat the protein, failing to appreciate that the protein would actually still be present! Many of the candidates who recognised that protein would be present in the insects either gave no further information or else made vague references to the investigation not being valid without stating why. We expected to see far more comments about it being unethical to harm the insects than we did.

The multiple choice in part bi was incorrectly answered except by the more able candidates.

The calculation in part bii was one of the few that caused problems to the candidates.

The first of our levels-based questions was part c. We were pleased that candidates had been taught to refer to all sets of data given. However, fewer candidates picked up on the command word as being 'explain' and therefore wrote lengthy, detailed descriptions of the data, capping their mark at 2. Those candidates who did try to explain the data made good attempts at using the information that they had been given in the question and we awarded 4 marks on several occasions.

## **Question 8**

The calculation in 8a caused problems to many candidates. Marks were lost through incorrect rounding or giving answers to too many decimal places.

With part b, only a small proportion of candidates were able to relate the lungs being attached to the chest cavity wall and diaphragm with increasing volume or decreasing pressure. It was only seen in the very best responses, thus limiting many candidates to a maximum of two marks. However, these two marks were gained by a number of candidates who were well informed as to the adaptations of normal lungs to gas exchange. A common error was to fail to relate the large surface area of the alveoli to faster diffusion. Also, a number of responses referred to alveoli as "being thin" or "one cell thick", with no reference to the lining.

However, candidates generally were able to relate maintaining a concentration gradient with good blood flow / good blood supply / ventilation.

Our second levels based question was 8c. Although there were a good number of candidates who only provided descriptions, many were able to accompany at least one of these descriptions with an explanation. There were a smaller, although substantial number of responses providing explanations to go with both graph descriptions. This meant that a number of candidates produced level 2 responses. Few level 3 responses were seen as many candidates talked about the speed at which oxyhaemoglobin dissociated, not appreciating

that the affinity of the haemoglobin for oxygen determined the percentage saturation at the different oxygen tensions.



