



Examiners' Report
Principal Examiner Feedback

Summer 2019

Pearson Edexcel International GCSE
in Human Biology (4HB1) Paper 01

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International GCSE Human Biology Summer 2019 Paper 01

Report

This was the first paper of the new specification and one or two general points emerged. Firstly, candidates should be aware that there are far more 'explain' questions rather than straightforward 'describe' questions. This means that in any answer, whilst it may be prudent to set down the relevant detail, more is required if they are to achieve full marks. Candidates should familiarise themselves with the command word details which are to be found within the specification so they are aware of what is expected. Secondly, at least ten percent of the marks are being awarded for mathematical questions so candidates need to be familiar with common mathematical manipulations. Thirdly, questions will be set on practical elements of the specification and so even if Centres do not carry out particular piece of practical work their candidates should be aware of how the work would be carried out in a laboratory situation.

Question 1

Candidates could usually identify the structures and knew the roles of ligaments. They usually correctly completed the equation for aerobic respiration though some did use chemical symbols rather than words. Most candidates were able to draw in the biceps and triceps correctly though a small minority did place the biceps muscle on the wrong bone.

Question 2

Although the majority of candidates were able to complete the diagram satisfactorily, a number of candidates drew a circle around the bacteria outside of the white blood cell. In part (a)(ii) some candidates incorrectly stated that leucocytes were the cells that engulf bacteria. In answer to part (b) many candidates secured all three marks but there was no pattern of incorrect responses.

Question 3

In answer to part (b) most candidates correctly plotted the points and drew a line of best fit. However, a minority joined the points dot to dot. Far too many candidates extrapolated the line of best fit beyond the plotted points. Although they were not penalised for this it is not good practice and candidates should be encouraged not to do it. There were many candidates who were unable to identify the anomalous result which was surprising in view of the fact that it was so obvious and of those who did correctly identify it, some were unable to give a simple explanation as to why it was an anomalous result.

Part (b)(iv) proved to be very accessible to most candidates.

In answering part (c) many candidates made the mistake of saying that someone with the condition would not be able to see the object. This is incorrect. The point is that the image would be blurred because it would be focussed in front of the retina. A number of candidates thought that it would be focussed behind the retina.

Question 4

The answers to part (a)(ii) often mentioned that cooking would kill the bacteria rather than making reference to the thermophiles being at their optimum temperature which would cause maximum growth. The answers to (b)(i) were often confused. Many candidates omitted to state that it would be necessary to measure the diameter of the clear zone, though many did understand the relationship between the size of the clear zone and the effectiveness of the antibiotic.

The answers to (b)(ii) were usually very poor. It was clear that very few candidates had performed any experimental work using aseptic techniques and where they attempted relevant descriptions, had little concept of the type of apparatus used for the investigation. Even if it is not possible to conduct practical work, candidates should have a theoretical knowledge of the techniques and apparatus involved in such investigations.

Question 5

Candidates were usually able to correctly calculate the mean height and to draw appropriate conclusions from the data. It was pleasing to note that many candidates could suggest appropriate ways to improve the investigation, though many did still state simply that the investigation should be repeated. Most candidates were able to correctly calculate the BMI though a not uncommon mistake was to forget to square the height figure in the calculation. Most candidates correctly stated that this person was obese and could list health problems that could accrue to the student. Some however, failed to mention that the student was obese.

Question 6

In answer to part (a)(i) candidates generally were able to correctly identify the trend. However, part (ii) caused problems. Most candidates were unable to move beyond a comparison with non-smokers with very few making any reference to other pieces of information that would have helped to form a conclusion. In answer to part (b) most candidates recognised that the mucus would remain in the airways but far fewer recognised that this could lead to increased incident of lung infection. The closest some candidates got to this point was to comment on the non-removal of bacteria by the cilia.

The calculation in part (c) proved to be challenging to many candidates with the calculation of the surface area proving to be the most difficult.

In answer to part (c)(ii) many candidates referred to surface area rather than the surface area to volume ratio despite the fact that it was included in the table in the previous question. Some candidates thought that the surface area of the alveoli was increased in a person suffering from emphysema. Many candidates described the effect on gaseous exchange though described this in terms of oxygen uptake rather than gaseous exchange. Candidates usually appreciated that less oxygen would reach the cells having an impact on respiration but often, there was no explicit statement that it reduced respiration.

Question 7

The areas of the brain were not well known. Many candidates put all three label lines in the same area of the brain. Most knew the name of the motor neurone but found difficulty, in many cases, in expressing themselves when describing a difference between a motor and sensory neurone.

The transmission of an impulse across a synapse is still not well understood. Although many candidates discussed the release of neurotransmitter or acetylcholine they failed to mention that it then diffuses across the synaptic gap. Very few candidates mentioned that the neurotransmitter attaches itself to receptors on the post-synaptic membrane to stimulate an impulse at that point.

Understanding of the role of stem cells needs further development. Although many candidates mentioned the fact that they are undifferentiated cells they failed to mention that in this process they would differentiate into nerve cells that could then be administered to the brain to take over the role of the affected cells.

Question 8

The whole of this question proved to be the most challenging on the paper. Whilst many candidates could give an adequate explanation of the transmission of *P. vivax* there were many who thought that *P. vivax* was the vector itself. There were many who thought that transmission was effected by coughing or the mixing of blood or through sexual intercourse.

Candidates failed to answer the question as set in part (b)(i). Instead of making a comparison as demanded by the question many simply repeated the figures that were given in the table. Candidates were given a prompt by being asked to use calculations: many chose to ignore this request.

Part (c) also caused problems. Many candidates scored one mark with a correct reference to the body forming antibodies or becoming immune. However, they failed to extend the argument which required references to the fact that this immunity would lead to the death of the causative organism and therefore, prevent transmission.

Although many candidates wrote down relevant points in answer to part (d), many failed to assign the points to either sexual or asexual reproduction. Instead, they left the examiner to decide to which type of reproduction they were referring, which of course the examiners are unable to do.

Question 9

In answer to part (a)(ii) many candidates only gave one genotype and others gave the blood groups ie A or AO rather than $I^A I^A$ and $I^A I^O$.

Candidates struggled to answer part (b)(i) correctly. They failed to appreciate that enzymes could digest/remove the antigens from the surface of blood cells and where they did mention it they failed to give any detail about those enzymes which meant that candidates did not access the full range of marks. Few could give any relevant examples of the advantages of using this method of producing blood group O.

The genetics question was very straight forward but candidates robbed themselves of a mark because they failed to either indicate the genotypes of the parents or failed to put in the lines from the gametes to indicate which gamete had contributed to the genotype of which offspring. Those candidates using a punnet square did not have to worry about the latter point and this is a preferable way to illustrate the possible outcomes of fertilisation.

The determination of the probability was answered correctly by many candidates.

