



Examiners' Report
Principal Examiner Feedback

Summer 2019

Pearson Edexcel International GCSE
in Human Biology (4HB1) Paper 02R

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International GCSE Human Biology Summer 2019 Paper 02R

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 were able to easily identify most parts of the eye. The one part that caused problems was part E, the eyelid, many candidates pointed to the eyelash instead.

The ray diagram to show the focussing of the spot on the retina caused difficulties for the majority of the candidates. Very few remembered that the light is refracted at both the cornea and by the lens. Many candidates failed to place the dot on the retina which meant they lost a mark.

Most candidates could identify two or three defects correctly, though some referred to cataracts and others had odd names for long and short sightedness.

Question 2

Candidates were generally familiar with the ball and socket joint and the parts of the bone including the cartilage. The function of the cartilage was well known. In part (c) the importance of diet for the development of bone and muscle was

very well known with a large number of candidates scoring full marks. A minority failed to relate the importance of protein in the diet to the development of muscles.

Question 3

Candidates coped very well with the percentage calculation. However, they found it difficult to provide correct conclusions from the data. Whilst some noted that overall smoking reduced the birth mass of babies very few were able to explain clearly and concisely that there were fewer babies born in the higher birth mass categories.

Candidates were able to describe the reasons for the low birth mass as a result of smoking with detailed accounts of carbon monoxide and its strong association with haemoglobin. However, where they failed to be clear was in stating that this led to a reduced oxygen supply to the fetus which in turn led to a lower rate of respiration in the fetus. However, better candidates described that aspect very well and then went onto describe the effect on mitosis and growth.

Question 4

Candidates found it difficult to estimate the proportions of the body attributable to the head and legs with only a minority answering both parts correctly. Although part (b) refers to proportions of the body many candidates failed to couch their answers in terms of proportions, instead they simply referred to the head becoming smaller and the legs longer.

Part (c) was particularly challenging to candidates with only a minority even making the point that it was for purposes of comparison.

Question 5

The process of active transport was well known by candidates with many scoring full marks.

It was clear that very few candidates had performed the potato osmosis experiment and found great difficulty in describing the experimental techniques. Marks were usually scored as a result of correct references to the pieces of potato being cut to the same size and for putting them in different

concentrations of solution. However, very few made reference to weighing the potato before the investigation and then drying and re-weighing at the end.

Candidates were usually able to correctly calculate the percentage change in mass but were unable to give much of an account as to why it is necessary to use percentage change rather than absolute changes. Of the reasons given the commonest was that the starting mass for each of the pieces of potato would have been different.

Very few candidates scored any marks in their answers to part (c)(iii). It would be usual to plot the results as a graph and where the line intersects the X axis would be the point of incipient plasmolysis and therefore the concentration of the cell contents. This is a standard osmosis experiment and a standard way of expressing the results.

Question 6

This question covered work that is new to this specification and it proved to be a particular challenge to candidates. They found it difficult to give two differences in answer to part (a) with hardly anyone discussing differences between the processing involved in the two forms of memory. The relevant area of the brain was well known but again, candidates found it difficult to state two symptoms other than memory loss. In fact many candidates simply gave different forms of memory loss as their answers. In answer to part (d) some candidates were able to state that the synapse was blocked but then did not proceed to give any details as to the effect that this would have on synaptic transmission. Very few candidates made any reference to the death of neurones occurring.

Part (d) was very poorly answered with hardly any candidates scoring any marks. Most thought that the answer involved the inhibition of the enzyme that cause the conversion of APP into beta-amyloid. In reality, the Examiners were looking for an account that included a reference to the inhibition of acetylcholinesterase which would prevent the breakdown of acetylcholine. The clue was in the fact that the question is all about synaptic transmission.

Part (f) was answered very well as candidates were able to easily select the correct information from the passage.

Question 7

It was unusual for candidates to score maximum marks with their answers to part (a) there being no pattern to the incorrect answers. The answers to part (b)(i) often made reference to oestrogen rather than progesterone and often, where the latter was mentioned candidates failed to say that its levels increased. The answers to part (b)(ii) were often confused. Candidates did not seem to appreciate that there would be no ovum available for fertilisation during those days and those that did, often failed to make any reference to the sperm and its viability for any possible subsequent fertilisation.

Part (c)(i) caused difficulties for candidates. They seemed unable to draw on what they should know about the digestion of lipids in the alimentary tract and apply that information to this situation. Even if they did appreciate that it would be digested they failed to explain the impact that this would have on contraception.

In answer to part (c)(ii) most candidates understood that the pill did not need to be taken during the time of menstruation.

Question 8

Whilst Alkaptonuria is not part of the specification it was used to set the context to test for topics that form part of the specification. This does seem to cause problems for candidates. Part (a)(i) was usually well answered though many candidates did not mention the term 'deamination' and a significant number decided to describe protein digestion. Very few candidates made any mention of the amino acids being used to synthesise other amino acids.

Part (a)(ii) was poorly answered. Candidates were given pointers with references in the stem of the question to cartilage damage and heart valve damage yet, in many cases, seemed unable to transfer knowledge gained in other parts of the specification into answering these questions.

Part (b)(i) caused real problems. This type of question is not normally asked in this format. Candidates were expected to use the pedigree to justify their answers but should know what to look for in a sex-linked condition. Part (b)(ii) also caused issues. Many candidates determined that the chance of having a male is one half and some went onto to state that the chance of the offspring having the condition was a quarter. However, they failed to multiply those two

fractions to get the overall probability. In fact in many cases they added the two together.

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