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Examiners' Report  
Principal Examiner Feedback

November 2024

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

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## **General Comments**

The high standard of many of the responses in the scripts were very impressive with detailed answers using key scientific terminology. It was quite evident that centres and candidates alike have put in a lot of effort into the preparation for these November examinations. For many candidates, their factual knowledge and understanding and the application of these was excellent. Their mathematical skills were generally good with many students scoring well on these questions in the paper, but some candidates failed to score full marks because they did not read the questions carefully. The responses with lower marks tended to lack depth with poor use of key words. Whilst there was generally good understanding of the various command words used in the paper, some confused the command words, describe, and explain. It is also recommended that candidates more aware of the command words, reliability, accuracy, and validity, particularly within the context of experiments.

### **Question 1**

(a) a significant number of students gained full marks. Some students confused the roles of the cervix and uterus. Another common mistake was progesterone instead of oxytocin for the last response.

(b)(i) the first and the third responses were well answered, condom and pill respectively, but the response for the natural method was often too vague with many mentioning the safe period, and surgical methods without being more precise.

### **Question 2**

(a) this was a well answered question with the majority of students scoring 2 marks

(b)(i) almost all students scored a mark for this question, with protein being the most frequent response.

(b) (ii) some students scored three marks for the correct calculation of 60, but quite a few got the first part of the calculation incorrect, where they confused which number was being divided, so were limited to a maximum of two marks for error carried forward.

(b) (iii) students scored full marks if they calculated the number of slices to be 100.4 or 101 slices, but many rounded the answer to 100 slices which was not enough to meet the RDA requirements.

(b)(iv) many candidates scored full marks for this question, some did not score full marks, because they failed to mention how the meat was prepared before the test was carried out. There was also the occasional student who mentioned the wrong test, for example, the test for protein.

### Question 3

(a)(i) almost all candidates correctly mentioned synapse or synaptic cleft

(a)(ii) most correctly indicated the correct direction.

(a)(iii) a significant number of candidates scored full marks, while some were limited to five marks because they did not mention pre or post synaptic membranes. Some of the candidates who scored poorly mentioned the transmission of impulses across the synapse.

(a)(iv) students struggled to get marks on this one. Most got the concentration gradient idea in some form. Many candidates did not indicate where the neurotransmitters originated from and are diffusing towards.

(b) many candidates two valid side effects.

### Question 4

(a) many candidates scored both marks, but for the first part of the question some mentioned oral rehydration therapy, which is a treatment rather than a prevention. For the second part of the response, 'killing mosquitoes', was far too vague.

(b)(i) many candidates gained both marks. However, for the first part of the question some mentioned a weak or compromised respiratory system or damaged lungs. For the second part, there were some robust marks, for example, on droplet infections, but some candidates were not credited for mentioning build-up of dust.

(c)(i) answered well with the odd students writing the reverse answer so better diet and more exercise which implied they contributed to lifestyle disease.

(c)(ii) most candidates gained at least 1 mark for this question. The most commonly seen response was 22250 for 2 marks with these candidates failing to achieve full marks because they did not use three significant figures for the answer.

(c)(iii) many candidates scored full marks. 2.4 : 1 was a common response and some gaining 2 marks for 2 :1 with correct working out.

(c)(iv) very few candidates linked the idea of living longer and therefore the possibility of having a greater chance getting of dementia and cancer. Many commented on factories and radioactivity which were not credited.

### Question 5

(a)(i) most candidates secured both marks for this question. For the first marking point some mentioned changes to the sequence rather than the base sequence and for the second marking point some commented on changes to gene rather than DNA.

(a)(ii) many students gained full marks, some with very detailed answers. Whilst many candidates mentioned a change in phenotype, some students repeated, 'characteristics', which was in the stem of the question and were not credited for the third marking point.

(b)(i) a significant number of candidates scored both marking points. Some candidates scored a mark for the haemophilia allele is linked to the X chromosome. A few candidates commented on haemophilia not being a sex-linked disease. Very few candidates realised that females could have the haemophilia condition.

(b)(ii) very few candidates got the two genotypes correct. Many candidates assumed the H on the Y chromosome meant there had to be h on the X, indicating dominant and recessive. So many students gave the answer with h on the X as well as H on the Y

(b)(iii) some candidates did a punnet square but did not identify XX as being females. It was rare to see that a student mentioning that girls cannot have the condition because have X

### Question 6

(a)(i) this was a well answered question with most candidates securing full marks. A few candidates had very little knowledge of the structure of blood vessels so scored no mark.

(a)(ii) many students gained 3 or 4 marks. Some students failed to provide a structural feature for the capillary diagram. Once again, a few students scored poorly because they had very little knowledge of the structure on blood vessels.

(b) some candidates correctly identified the structures associated with the various blood pressures. Some, however, identified the highest blood pressure as the artery, whilst others mixed up the capillaries and vein, probably thinking the smallest pressure must be associated with the blood vessel with the smallest diameter. Unfortunately, some students linked the blood pressure to different parts of the heart.

### Question 7

(a) many candidates secured both marks for mentioning that it was the body temperature and therefore the optimum temperature.

(b) candidates needed to highlight that they were changing the pH, so that they were looking at the effect of pH on enzyme activity. pH alone was not credited.

(c) candidates found this question very challenging because many were not aware of the command words, valid and accurate, so tended to write answers about the reliability of the experiment. Some candidates were able to secure marks for mentioning the variables that were kept the same and also for mentioning that the time was different for the different pH values.

(d) only a small number of candidates secured 3 marks. Candidates scoring one or two marks tended to mention the absence of enzymes and the correct total volume of the final suspension. A few candidates commented on keeping all the variables the same, which was not specific enough to score a mark.

(e) very few students scored both marks. Optimum pH was most common answer that was credited with a mark, many suggested that the optimum pH was 2 rather than between pH 2-4.

(f) this was a well answered question with most candidates identifying the correct part of the alimentary canal and also provided a rationale for their decision. A small number of students identified, the small intestine, which was incorrect.

