Examiners' Report
Principal Examiner Feedback

January 2023

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

General points that arose from this series are ones that have been reported to Centres on previous occasions. Firstly, many candidates are not showing their workings for calculations. Whilst this is not material where a candidate simply writes down a correct final figure, it does become significant when that final answer is incorrect and none of the intermediate stages are shown. No marks can be awarded.

Secondly, many candidates fail to apply knowledge correctly in answering certain questions. They simply repeat facts without applying those facts o the question. The best example of this point is question 3(b)(i). The simple correct answers were that the sample contained starch and protein but did not contain reducing sugars. Many candidates described the results of the tests if a positive or negative result was obtained. This is not answering the question.

The third issue is demonstrated by question 6(a)(ii). The use of the term 'amount' is not acceptable when a candidate should be referring to 'mass' or 'volume'.

Question 1

In answer to part (a)(i) it was pleasing to note that very few candidates used more than one line from box to box though there were a sizeable number of incorrect connections, but no pattern emerged of incorrect responses. Some candidates could not describe the cause of cataracts with respect to the lens and a common incomplete answer to part (b)(ii) was to state just 'surgery' without any reference to the lens. The calculation proved to be straightforward, and the vast majority of candidates could identify vitamin A.

Question 2

Most candidates gave the idea of movement/motility in response to question (a)(i).

Candidates tended to score well in answer to part (a)(iii), with references to haploid cells and diploid cells resulting from fertilisation common. Not too many made any reference to genetic variation, but there were references to variation in offspring/zygote. Part (b)(i) was generally well answered; where it wasn't the egg and or sperm were XX XX/XY XY instead of X X/ X Y.

In answer to part (b)(ii) weaker responses referred to sperm penetrating the egg by force or due to the shape of its head. There were quite a few references to acrosome and enzymes and fewer references to digesting the egg cell membrane. Quite a few references to fusion of nuclei that was in the stem of the question and weren't required. Overall, it seemed candidates did well on this question.

Question 3

Candidates did seem to struggle a little with part (a)(II). Some didn't use the term emulsify and rather described the process using vague terms like 'fat molecules are broken down to smaller molecules/droplets/pieces. Not many referred to bile's role in neutralising stomach acid. Few references to increasing surface area. Misconception that bile breaks fats/lipids down to fatty acids and glycerol was quite common.

In answer to part (b)(i) the most common incorrect answer was not identifying either 'reducing' sugars or a negative result for reducing sugars. In answering 3(b)(i) candidates often scored at least two marks here (amylase and starch breakdown). Weakest responses suggested that saliva already contains glucose. It was nice to see some candidates recognising that salivary amylase breaks down starch into maltose. The answers to part(c) were varied and often incomplete. There were many references to peristalsis and muscle contraction pushing food. Few candidates used the term bolus. Fewer candidates made any reference to the fibre adding bulk or to it stimulating the muscles to contract. Quite a few references to constipation and preventing colon cancer which does not answer the question even though it may have been correct. Quite a few extraneous references to chemical digestion by enzymes, etc.

Question 4

Part (a)(i) was generally well answered though a common incorrect answer was cell membrane. Most candidates scored 2 marks with their answers to part (a)(ii). Weaker responses multiplied 55 by 1000. There were many vague references to 'more pollution' in answers to part (b)(i). Few candidates referred to waste/rubbish/sewage. Higher populations in towns was a common response. In response to part (b)(ii) Very few candidates referenced flies landing on faeces. Many referred to the transmission of bacteria from flies to food when landing on food and also human consumption of this food leading to infection. Weakest responses confused flies with mosquitoes and infection via bite/blood.

In answering part (c)(i) candidates struggled to reach MP1 because they weren't able to interpret the question correctly. Very few references were made to more /high levels of typhoid in particular parts of the world. Candidates did occasionally state that more raw/untreated sewage/poor hygiene could lead to typhoid, but they didn't really hit MP4 very often at all. The map in the stem of the question seems to have been ignored in the answers.

In their responses to part (c)(ii) many candidates referenced mutation and many then related this mutation to antibiotic resistance/survival/reproduction of resistant bacteria for 3 marks. Few referenced the potential of more serious infection but there were quite a few references to new antibiotics needed to treat infection.

Question 5

Quite a few candidates failed to give a range of ages, instead suggesting one young and one old person be used in their answers to part (a)(i). The other problem here was the hearing test suggested, with many candidates referring to a range of frequencies rather than high frequencies (specified in the stem of the question). Not too many gave a suitable control either.

Many candidates referred to damage to eardrums or bones of the ear for no credit. Very few referenced exposure to loud noises over a long period of time. Didn't see any references to genetic cause. Not many scored here.

Candidates struggled to answer part (b)(i). There were few references to the ossicles and cochlea. Most candidates seemed aware that the fluid interrupted the transfer of vibrations. but did not expand upon their answers to discuss generation of impulses. Not many scored 3 marks.

In answering part (b)(ii) many candidates scored at least one mark here. References to increased bacterial growth or bacteria/pathogens becoming trapped were fairly common. Not too many referenced warmth or moisture, with vague references to 'optimum conditions'.

The role of the semi-circular canals in the maintenance of balanced was not well understood. There were references to fluid, but a coherent account of the process was usually lacking. There were few references to the cerebellum.

Question 6

Most candidates scored both marks for the simple calculation.

Answers to part (a)(ii) were generally weak. Overwhelmingly the most seen incorrect answer was using 'amount' instead of volume; and volume of live' yogurt; other common incorrect answers were pH and temperature indicating that candidates had not read the question very carefully.

Answers to part (a)(iii) usually yielded one mark for a correct reference to using other temperatures. It was very rare that a correct range of temperatures was included in the answer.

Many candidates scored one mark for a correct reference to killing of bacteria/pathogens. Fewer scored a second mark. There were quite a few references to denaturing enzymes without referencing killing the bacteria used in the starter culture.

Candidates answered part (b) very well, with many referring to enzymes being denatured and their active site changing shape. Not many candidates referred to inhibition of bacterial growth, and weaker candidates just said that pH 4.4 isn't the optimum pH for the bacteria without any further explanation.

Many candidates correctly identified that the beads can be reused. Fewer referenced increased surface area. Quite a few candidates said the process was cheaper for no credit. Not too many referenced temperature stability.

The answers to part (c)(ii) were rather poor, but there were references to short diffusion distances quite often. Some candidates referenced mitochondria in epithelial cells and ATP production for active transport for no credit. Few candidates mentioned the capillary system maintaining a diffusion gradient.

Question 7

Definitions of mutation were good. Fewer referenced change in amino acid sequence, rather change in the shape of an acid. There were few references to mRNA codons. Many of candidates repeated different phenotype that was in the stem of the question. The best responses referred to different protein function or shape, but there weren't too many worded in this way.

Answers to part (b)(i) were good. The only mark point that wasn't really common from candidates was increased life expectancy with a transplant. Lots of 2 marks awarded.

In answer to part (b)(ii) the only issue was some candidates calculating a percentage change. Most scored 2 marks.

Answers to part (b)(iii) tended to score at least one mark, with many scoring two. The least common answer was two recipients from one donor. The biggest issue was candidates writing multiple answers on one line even though they'd been given two lines with numbers to write on. Quite a few references to the success rate of kidney transplants for no credit.

Lots of 1:3 - misunderstanding ratios in answering part (c)(i).

Part (c)(ii) provided a range of answers. Many candidates seemed to understand the genotypes of the parents but didn't identify them as person A or B and so missed the first two marking points. This is particularly disappointing as a question earlier on in the paper set out a Punnett square correctly. There were also correct phenotypes given for offspring, but candidates often forgot to put in a ratio or use the terms heterozygous or homozygous recessive, so marks were lost. The weakest responses used X and Y or different letters for the genotype (like AB and aB