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Examiners' Report
Principal Examiner Feedback

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

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Candidates still struggle to deal satisfactorily with questions that require a knowledge and understanding of the practical work aspects of this subject. There are a number of embedded practicals within the specification plus a number of suggested practicals. It is appreciated that not all Centres may have the necessary apparatus to perform certain practicals, nevertheless, it is always possible for candidates to avail themselves of diagrams and read how to use such apparatus. Candidates should also be prepared to read the whole of a question to ensure that they are not repeating themselves. For example, when there is a question asking how a particular investigation should be performed, it is a waste of time to describe factors that should be controlled if there is a part of the question later on that asks that very same thing. Each part of a whole question should not be treated in isolation.

Question 1

the majority of candidates could identify the two types of teeth correctly, though some put a list of two or more which negated any correct answer. Surprisingly few candidates could state that canines tear or rip food. Many said 'chew' or 'bite'.

In answer to part (b) there were many candidates who scored all four marks. The most common mistake was to identify an incorrect pH of the mouth. Some candidates wrote maltase rather than maltose for the sugar produced when amylase breaks down starch.

There were many spellings of the term 'oesophagus' but as long as it was phonetically correct it was accepted. There were a few 'gullets' seen.

Whilst many candidates correctly referenced 'peristalsis' or gave a description of rhythmical waves of contraction, far fewer candidates made reference to the food/bolus being pushed along.

Question 2

Most candidates could complete the box correctly in answer to part (a)(i) though a minority put more than one tick on some or all of the rows. In answer to part (a)(ii) most candidates recognised that the wall or muscles of the uterus contract but very few made any reference to the cervix dilating or widening. There were a variety of hormones listed in answer to part (iv) with FSH being quite widely given.

The diagrams drawn in answer to part (b)(i) were of a variable quality. Whilst many mirrored the position and shape of the parental chromosomes many others did not and a minority did not make it clear whether they were drawing single or double chromosomes. Most candidates were able to answer part (b)(ii) correctly.

Question 3

Many candidates gave an appropriate description of mutation. A common error was to not specify that the mutation occurs in DNA, or to not specify that it was the sequence or order of bases that is changed rather than just a change in bases/DNA.

The majority of candidates identified the possible genotypes of the offspring correctly. Many also identified the gametes correctly. Some candidates did not include the gametes at all. Marks were available from a genetic diagram – drawing a Punnett square helped candidates to show the required gametes and offspring genotypes.

Many candidates identified suitable advantages and disadvantages of a kidney transplant.

Question 4

Most candidates correctly calculated 31% in this very straight forward question. However, some candidates could not count up the correct numbers on which to base their calculation.

Part (b)(ii) was a challenging question with some candidates describing division of cells by mitosis to ensure two chromosomes were present in daughter cells. Where answers were focused to the question, answers were a little vague, with some answers including the gametes fusing so that the zygote inherited an allele from each parent. Some also included that gametes were haploid.

In their answers to part (c)(i) many candidates showed different possible combinations of genotypes of parents which could result in a child with cystic fibrosis. Most candidates did identify that one parent would be heterozygous and the other homozygous recessive, mainly through the use of various letters. It is important for candidates to remember that if the letters have the same form in upper and lower case that these should be easy to distinguish by their size.

Most candidates were able to identify a symptom of cystic fibrosis. The most common answers seen were coughing and the production of a lot or sticky/thick mucus.

Question 5

In answer to part (a) most candidates correctly identified 'muscles'.

Part (b) was challenging for the candidates. Many described the passage of blood through the double circulation but did not focus their answer to the actual question that had been asked.

The majority of candidates named 'hormones' in answer to part (d)(i) though a few named a specific hormone.

The majority of candidates gained the mark for platelets in their answers to part (d)(ii).

Most candidates were able to calculate the number of red blood cells and it was pleasing to see that many showed their working, and where the final answer was incorrect, these candidates could often be awarded some marks for correct stages in the calculation.

Question 6

Answers to part (a) lacked the specific detail required. Most candidates identified that blood flow or oxygen supply was reduced to the heart rather than to the heart muscle. Plaques narrowing the lumen and causing high blood pressure was often seen. This did not gain any credit as it was not relevant to the question asked. Many candidates did gain the final marking point.

Most candidates correctly described the relationship shown on the graph. A common mistake was to state the statins lower blood cholesterol.

Candidates that identified the correct percentage from the graph went on to calculate the correct ratio. Some candidates did not complete the calculation and expressed a ratio of 1: 31/17 which did not gain credit for the ratio. There were many answers where the percentages taken from the graph were incorrect.

There were many vague answers given to describe how the data could be collected. Candidates tended to identify that a sample of people would be required but few identified the need to know how many would be using statins. The idea of measuring the cholesterol level was often seen, but very few candidates realised that this would require a blood sample to be taken.

Most candidates identified that gender and/or age of the sampled people should be taken into account. As many gave both of these, they gained only one mark. Another common answer was controlling diet.

Question 7

The two equations were well known in answers to part (a)(i) and (ii).

Few candidates were able to draw the apparatus that would be used. This is a standard experiment and so it is very disappointing that candidates were not able to reproduce the set-up of the apparatus.

There were some good descriptions given on how this apparatus would be used. A common mistake was to suggest that the person would blow out into the mouthpiece rather than breathing through the mouthpiece. Although candidates generally identified that the limewater would turn cloudy, some did not realise that the time for this to occur should be measured.

Part 7(b) was a challenging question with many candidates giving vague and unfocused answers. Answers often included the idea of ATP being broken down to ADP and P, releasing energy. Some also described the formation of ATP. The idea of energy being released from the breakdown of glucose to form ATP in respiration was rarely seen.

Question 8

Many candidates described the idea of insulin converting glucose to glycogen which is incorrect. Although most candidate did identify that insulin is secreted by the pancreas, they did not link this to being in response to high blood glucose levels. There were some answers which incorrectly suggested that glucose is converted to glucagon.

Most answers included vasodilation and increased the loss due to this process in answer to part (b)(i) However, fewer answers correctly described that vasodilation increased blood flow near the surface of the skin.

Most made reference to vasoconstriction in answer to part (b)(ii)

There were many vague answers given in response to part (b)(iii). The idea that the hypothalamus detects changes in body temperature was rarely seen.

Many candidates identified that enzymes would work slower, and some linked this to a lower metabolism. However, many answers were vague; many candidates went on to describe the slowing down of digestion leading to poor growth.

