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Edexcel

Examiners' Report
Principal Examiner Feedback

Summer 2024

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

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General Comments

The high standard of many of the responses in the scripts were very impressive and it was quite evident that centres and candidates alike have put in a lot of effort into the preparation for these summer examinations. For many candidates, their factual knowledge and understanding and the application of these was excellent. Mathematical skills were generally good with many students scoring well on the three questions in the paper, all involving a number of steps. The responses with lower marks tended to lack depth with poor use of key scientific terminology. Whilst there was generally good understanding of the various command words used in the paper, some confused the command words, describe and explain.

Question 1

For 1(a)(i), most candidate stated two similarities between the two cells, but a few incorrectly mentioned nucleus and mitochondrion in their answers. Most also gained two marks for 1(a)(ii), but a few were not credited despite stating correct differences, because they did not go on to specify which cell they were alluding to.

Most candidates were able to link the parts of a microscope with their function, though some incorrectly stated that the role of the objective lens was to produce a more focussed image.

It was quite pleasing to see many candidates scored full marks for question 1(b)(ii). There were, however, some issues with the conversion of cm to mm with some either forgetting to multiply by ten or multiplied by one hundred instead. Furthermore, a few multiplied rather than divide by the magnification.

Question 2

In (a(i)) red blood cells and white blood cell correctly identified, but a few labelled the plasma component as cytoplasm and for (a)(ii) some failed to mention the transport function of red blood cells. A small number of candidates mentioned disease in (a)(iii) which was not credited as they had to mention disease caused by a pathogen.

Though many candidates scored both marks for 2(b), it was quite clear that a few students did not have knowledge and understanding of the structure of the three types of blood vessels and how these are related to their functions.

For 2c(ii) many candidates described the correct route taken by blood from the right atrium to the left atrium. Some were a bit vague and omitted pulmonary artery and the pulmonary vein.

Question 3

(a)(i)

Most candidates scored the first marking point, by describing the components of a balanced diet or the need for consuming them in the correct proportions, but very few mentioned that a balanced diet was a requirement to remain healthy.

For (a)(ii) candidates who scored full marks used the data from the table to calculate the difference in energy requirements and then went on to explain that this was due to the difference in muscle mass and metabolic rate. Candidates were not credited for the difference in energy expenditure was due to difference in physical activity.

For question (a)(iii) candidates gained full marks for their explanation that there is blood loss during menstruation and iron was required in the synthesis of haemoglobin. Some answers were superficial, stating that iron was required for blood or blood cells, and they did not gain credit.

Most candidates scored a mark for Vitamin A in question (a)(iv), but unfortunately some named Vitamin C in their answer.

Many students scored full marks for 4.35 mg. Others calculated the iron content of red meat and broccoli correctly, but they did not subtract their total from 12 mg which they could have obtained from the table at the beginning of the question.

For question (b)(i), many candidates gave a correct symptom, the most common being, bleeding gums, but for a few candidates, were a bit vague, and though they mentioned gums they did not go on to say they were bleeding and for (b)(ii) whilst most linked the decrease of scurvy to more vitamin c in the diet, some were less precise by stating that there was better nutrition.

Question 4

For (a)(i) most candidates correctly plotted the graph, but a few did not label the axes or use the unit, minutes, for the time taken. Though the question asked to draw a curve of best fit for (a)(ii) some proceeded to join the plotted points with straight lines. Using the plotted graph, most determined that the optimum pH was 6, but a few had the optimum at pH 2.

For (a)(iv) many scored 2 marks for describing a decrease in time until pH 6 when then increased afterwards. Some scored one mark because while they described a decrease followed by an increase in time but did not state the pH at which it stopped decreasing. Rather than describing the trend, some candidates cited the time taken at various pH values. A few candidates explained rather than describe the data.

In (vi) there were mixed responses, some correctly naming the mouth and small intestine as areas where digestion of starch took place. A number, however, incorrectly named the stomach, while others named the source of amylase, salivary gland and pancreas.

For (a)(v) The majority of candidates could explain the lock and key theory and used the term denaturation. Some did not give enough detail on changing shape of the active site. Many candidates confused pH and temperature discussing increasing kinetic energy and number of collisions.

(b) Though the majority of students described the starch test by naming the correct reagent and colour change, a few described the Benedict's or biuret test.

Question 5

Many candidates named the correct type of joint for (a)(i) but a few simply stated they were synovial joints, and some named the actual joint, for example knee joint.

For (a)(ii) many candidates correctly described the degree of movement afforded by the two types of joints. Credit was not given for more vague answers, such as being able to move in one direction or all directions or more vs limited movement.

In (b)(i) many correctly said that the role of part x was to join one bone to another bone, but a number described the function of a tendon instead. For (b)(ii) many correctly described the role of cartilage to either prevent bones rubbing together or to reduce friction between them.

Question 6

Part (a) answered well with most students scoring full marks. Some answers incorrectly, linked FSH and oestrogen to ovulation.

For Part(b) nearly all candidates scored a mark. IUDs or hormonal treatment, which were not credited.

While some candidates described in-vitro fertilisation accurately, some were unfamiliar with this method. Many failed to name the hormones involved in fertility treatment. Some candidates mentioned fertilisation taking place in the uterus rather than outside the body. Some stated that the zygote was placed in the uterus rather than the embryo.

Most students scored full marks for part(d) It was very well answered and many candidates could state the advantages of breastfeeding. Incorrect answers included milk at the right temperature or containing nutrients rather than the balance of nutrients. Some discussed that it was cheaper than formula milk.

Question 7

Most secured a mark for naming receptor as the correct structure(a)(i) Some candidate named the sensory neurone which was not credited. (a)(ii) was also well answered, but a few incorrectly named relay or sensory neurone.

(b)(i) Whilst most candidates secured a mark for stating that these cells were able to carry out a specific function, fewer described that they had specific structures or adaptations to carry out this specific function. A small number defined differentiation.

Part (b)(ii) answered well and many scored full marks. A few incorrectly drew a sensory neurone and were credited with the labelling marks. Some candidates did not include axon terminals in their drawings. Many correctly described the function of a motor neurone for (b)(iii), but a few did not state that impulses originated from the central nervous system.

For Part C, some candidates followed the correct steps and consequently secured full marks for this calculation. Some used the incorrect formula and therefore got the wrong answer. For some who used the correct formula, there were some issues when converting from seconds to milliseconds with many failing to multiply by one thousand.

Question 8

Many candidates correctly named the correct type of pathogen as bacteria for (a)(i). On the other hand, some named the pathogen that caused cholera, which was not credited, or an incorrect pathogen. Most correctly stated for (a)(ii) that it was transmitted by contaminated food or water. A small number thought that it was sexually transmitted.

(a)(ii) most got this right but a few mentioned that it was sexually transmitted.

Part(b) was well answered with most candidates stating oral rehydration therapy and then going on to describe that solute was dissolved in water, with some realising that the water had to be sterile. Some students were very vague in their description of ORT so were restricted in the number of marks that was achieved. A number of candidates thought that it was treated with monoclonal antibodies and vaccines, both of which were not credited.

Question 9

A number of students scored all five marks. They were clear that the changing blood concentration was detected by the hypothalamus which then led to the role of the pituitary gland and ADH. Some students scored highly on this question whilst others found it more challenging. Some students confused concentration of blood and level of water, most knew it was the pituitary gland that releases ADH, some said into the bloodstream but not all. Some candidates did not use the term concentration or volume of urine.

