
LEVEL 3

APPLIED SCIENCE

1775/ASC4 The Human Body
Report on the Examination

1775/ASC4
June 2023

Version: 1.0

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General

The paper gave students the opportunity to apply their knowledge and understanding across all six topics in this unit. It was clear that while some students were able to attain high marks, some aspects of the paper proved to be challenging for the majority of students.

Presentation was generally good with handwriting being legible and it was clear that the space provided for answering questions was sufficient for the vast majority of students, with only a limited number of students needing to use the additional paper at the end of the question booklet. It was also clear that students had sufficient time to complete the paper as all questions were attempted by the vast majority of students.

It is important that students read command words carefully as this guides them in how to respond to the question. For example, in question 1.6, the vast majority of students answered this explanation question in the style of 'Give' or 'State', and thus did not gain credit.

Question 1

- 1.1. The majority of students scored full or partial credit for linking the nutrient in food to its role in the body. Those students who did not score marks made a full range of linking errors, but the most common correct 1 mark response was for linking carbohydrate to its role in respiration to provide energy.
- 1.2. Over three quarters of students correctly identified scurvy as the disorder caused by vitamin C deficiency. Those students who did not gain the mark often selected 'rickets' as their answer.
- 1.3. The vast majority of students gained 1 or more marks for identifying the nutrients the child in the question was deficient in, with just over one third gaining full marks. All three incorrect options were chosen by some students.
- 1.4. This question discriminated well, and around 60% of students gained both marks for giving two ways in which the small intestine ensures efficient absorption. The most commonly seen correct answers were for the large surface area, the presence of villi and the presence of microvilli.

Some students wrote that the small intestine was thin, but this is insufficient, and students needed to make clear that it is the **wall** of the small intestine that is thin to gain credit.

- 1.5. Just over 45% of students gained marks in this calculation question and about 20% gained full marks. There were a further 20% that gained 2 marks. Here there was a magnitude error due to lack of multiplication by 100 when calculating the amount of each milk that needed to be drunk, thus giving them an answer of 17.6.
- 1.6. Students seemed to find this question difficult and only around 20% gained credit. Students need to take note of the command word used in the question. In this case we asked students to **explain** one advantage and one disadvantage, not simply give an advantage and a disadvantage. Therefore, answers that were simple comparisons such as 'it has less sugar' or 'it has a higher fat content' were insufficient to gain credit due to a lack of an explanation.

Those students who did gain marks often did so for explaining the advantage of having less sugar or more calcium and / or for explaining the disadvantage of a higher fat content.

Question 2

- 2.1. Nearly 90% of students correctly labelled the frontal lobe of the brain. Although the vast majority of labelling was clear, students should be clear that label lines need to touch the part they are indicating for the avoidance of any doubt.
- 2.2. Around 70% of students correctly labelled the cerebellum.
- 2.3. This question discriminated well, with around one third of students gaining 2 marks and a further third gaining 1 mark. It was clear in some students' answers, that they were describing effects of lobe damage rather than damage to the brain stem. The most commonly seen correct answers were for a change in heart rate, a change in breathing rate or lack of consciousness.
- 2.4. Over 90% of students correctly selected the role of the occipital lobe.
- 2.5. Over half of all students gained 2 marks in this question for stating the role of the somatic nervous system and giving an example, such as movement or a specific example of movement. A further 15% gained one mark, often for a correct example without precisely describing the role as control of voluntary actions.

A significant minority described the somatic nervous system as controlling involuntary actions and gave examples of reflex actions.

- 2.6. Over two thirds of students gained full or partial credit in this question. Most of the possible correct answers on the mark scheme were seen, but the most common correct answers were:
- increasing heart rate
 - dilating pupils
 - increasing breathing rate
 - decreasing digestion.

Some students gave converse answers which would be correct for the parasympathetic nervous system.

Question 3

- 3.1. Only 15% of students correctly named the type of joint between the ulna and radius. Common incorrect answers were hinge and ball and socket. A significant minority of students gave an answer of 'synovial joint', but this was insufficient to gain credit.
- 3.2. Nearly two thirds of students described the role of the ligaments as holding the bones together or holding the ulna and radius together in the joint. Some students referred to the ligaments as holding the joint in place which was insufficient. A relatively common misconception seen was that the ligaments hold the muscle to the bone.

- 3.3. Over half of all students gained 2 marks for naming the two processes involved in healing bone. A further 20% correctly gave one of the processes. A range of spellings were seen for reabsorption and ossification but as long as these were spelt phonetically, credit was given.
- 3.4. Nearly 90% of students gained 1 or 2 marks for their explanation. Some students simply referred to friction on the exposed bone, but this was insufficient to gain the second marking point.
- 3.5. Nearly three quarters of students correctly described synovial fluid as a lubricant or a shock absorber.

Question 4

- 4.1. Around 80% of students correctly gave one symptom a person might have on a low carbohydrate diet. Commonly this was for the idea of tiredness / fatigue. Constipation and bad breath were also seen occasionally. Some students incorrectly linked low carbohydrates to lack of strength which was not credited.
- 4.2. Only 17% of students gave a fully correct calculation and ratio in this question and a further third gained 1 compensation mark for correctly deriving 1:8 for the first part of the ratio. Commonly students simply multiplied each number by 100 instead of dividing the values by the lowest value of 0.98.
- 4.3. The majority of students gained full or partial credit in this question. Most commonly this was for the idea that the body mass would decrease too quickly or that the diet would result in loss of muscle strength. Some students simply wrote 'people would lose weight' but without further qualification about the amount or speed of loss, this was insufficient to be a disadvantage of a diet.
- 4.4. Students found this question challenging and only just over 6% of students gained credit.
- 4.5. This question discriminated well with approximately 30% of students gaining 1 mark, and a further 30% gaining 2 marks. The most commonly stated correct answers were the idea of respiring anaerobically, quick fatigue, and not having many mitochondria.

Question 5

- 5.1. This question discriminated very well with approximately 25% of students gaining 1 mark, 20% gaining 2 marks, and a further 20% gaining 3 marks. The most commonly seen marking point was for vesicles, although some students gave this answer as neurotransmitters, which was not credit worthy on its own.
- 5.2. This question discriminated well, but only around 30% of students gained any marks, with 10% gaining 3 or 4 marks. The most commonly confused marking points were the idea that the vesicles move to the presynaptic membrane and fuse with it causing the release of the neurotransmitter. Some students thought the calcium ions fuse with the membrane, and some thought the neurotransmitter did.

- 5.3. Around half of the students gained full marks in this question and could give correct disorders linked to a lack of each neurotransmitter. The most commonly seen confusion was between acetylcholine and dopamine and the links to Alzheimer's and Parkinson's.
- 5.4. This question discriminated well and around 40% of students gained partial marks, often for stating that the neurotransmitter would not be broken down or for saying that there was an increase in acetylcholine. However, only a very small percentage (around 3%) could develop their suggestion and link the increased neurotransmitter to the idea of continuing to stimulate the postsynaptic receptors.

Question 6

- 6.1. Just over half of the students gained full or partial credit in this question with many describing the presence of haem groups or iron ions for 1 mark. Around a fifth of students gained both marks. The idea of haemoglobin being four protein or polypeptide chains was missed by most students.
- 6.2. Around two thirds of students gained at least partial credit in this question and if only 1 mark was gained this was often for drawing their line to the right of the existing curve. Some students drew their line to the left and considerable numbers finished their line much higher or lower than the existing curve.

Around 8% of students did not attempt this question.

- 6.3. This question discriminated well, so although only 15% of students gained marks, it was the more able students who could demonstrate their knowledge here. A significant number of students wrote about the affinity changing, which did not gain credit.
- 6.4. Almost two thirds of students gained credit in this question. The most commonly seen incorrect answer was 'sphygmomanometer' and vague answers such as 'the finger clip machine'.
- 6.5. This question discriminated well with around two thirds of students gaining 1 or more marks and 30% gaining 2 or 3 marks. Some excellent explanations were seen, often using the ideas of increased EPO and its effect on the number of red blood cells. The most common correct idea was for the lower partial pressure of oxygen at higher altitude.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the [Results Statistics](#) page of the AQA Website.