AQA

APPLIED GENERAL
APPLIED SCIENCE

1775/ ASC4 The Human Body
Report on the Examination

1775
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General

The mean mark in this series was slightly higher than in June 2022 series and January 2022 series.

In this report, the performance of students in this series is summarised in a way that is as helpful as possible to teachers preparing future cohorts.

This paper gave students the opportunity to apply their knowledge and understanding across all five key areas within this unit. It was clear, as with last series' exam, that the best students had managed to prepare well for this examination and were able to attain high marks. However, there were a number of aspects of the paper which proved to be very challenging for some, including explaining the effect of a drug on the symptoms of a disorder, articulating the range of motion in one type of joint, and explaining the stages involved in the contraction of a muscle.

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, as there were very few additional pages to mark. It was also evident that students had sufficient time to complete the paper. All questions were attempted by the vast majority of students.

Question 1

1.1   Over four fifths of all students correctly selected the form in which nerve impulses travel along neurones. The most common, incorrect distractor was 'chemical signal'.

1.2   In this question students were asked to identify different parts of a neurone. Nearly half of all students gained full credit and a further fifth gained two marks. Of the incorrect answers seen, a common incorrect response was to identify the myelin sheath as the Node of Ranvier.

1.3   In this scaffolded question, students were required to identify different branches in the organisation of the nervous system. Nearly 50% of all students gained full marks and a further 20% gained three marks; 17% two marks and 8% gained one mark. Identifying the 'somatic nervous system' appeared to be the most difficult for students to remember. Phonetic spelling is allowed as a general marking principle, but some of the spellings of sympathetic and parasympathetic were too far away from phonetic to gain credit, e.g., 'synthetic'.

1.4   Over 80% of students correctly identified the fourth lobe that was not shown on the labelled diagram.   Those students who did not gain credit often named other parts of the brain such as brain stem or cerebellum.

1.5   Approximately 60% of all students could correctly describe the function of the occipital lobe. Some students simply wrote 'vision' which is too vague to gain credit given the function of the eye.

1.6   Nearly three quarters of all students correctly identified the brain stem as the part of the brain that controls breathing rate and heart rate. Incorrect answers included the cerebellum and any of the four lobes.

1.7   This was a high level demand question. It required students to interpret the image and describe two symptoms that would be observed in the person, linked to their expected knowledge about the roles of the different lobes of the brain. A significant minority of students only answered in terms of what the functions were, giving answers such as 'reasoning' or 'movement', which does not answer the question asked and were insufficient. Students needed to make clear that there would be issues or problems with these areas, e.g., problems with memory or inability to problem solve.

The distribution of marks for those students who did gain credit was evenly spread and the question discriminated well. Approximately 30% gained full credit, 25% gaining two marks and a further 25% gaining one mark.

1.8   Three quarters of all students gained credit for selecting the correct answer about the function of acetylcholine in the nervous system.

1.9   Some good answers were seen in this question with a quarter of all students correctly explaining how the increase in drug X would reduce the symptoms of Alzheimer's. A further 50% gained one mark, and often this was for recognising that drug X would result in less acetylcholinesterase production.

Question 2

2.1   Over three quarters of all students gained full credit for labelling the oesophagus, pancreas and gall bladder. Of the third of students who gained one or two marks, the most commonly seen incorrect answers were for labelling the gall bladder as the liver or mixing up the pancreas and gall bladder.

2.2   This question discriminated well, with just over 10% gaining full marks, one quarter gaining two marks and a further quarter gaining one mark. Approximately one third of students did not gain credit.   Some excellent answers were seen, fully describing the role of bile and lipase, including the breakdown of fats to fatty acids and glycerol by breaking down the ester bonds.

A significant minority of students failed to gain credit for recognising bile as the emulsifier of fats, because they went on to describe this process as 'breaking down' fats. Some students conflated the two chemicals stating that 'bile and lipase emulsify and break down fats', and credit was not able to be awarded.

A further issue seen in a small, but significant, number of responses was giving the role of lipase as breaking down fats to fatty acids, but glycerol was omitted.

2.3   The vast majority of students gained at least one mark in this question, and over three quarters gained two or three marks.   The most common, correct response was for giving milk, cheese or dairy for calcium.   A wide range of possible answers for vitamin C were seen, and where students failed to gain credit, it was often because their answers lacked precision, e.g., 'green vegetables'.   Similarly a significant minority of students did not gain credit for vitamin D as they stated 'meat' or 'fish' without specifying that this would be **red** meat or **oily** fish.

2.4   Broadly one third of all students gained full marks and a further third gained one mark for giving the consequences of high blood pressure. The most commonly seen correct answers were for heart attack or heart disease and stroke, although aneurysms and kidney disease were also seen.

2.5   The vast majority of students correctly identified processed meat as a food to be reduced in a person with high blood pressure.

2.6   Most students identified a sphygmomanometer as the equipment used to measure blood pressure.

Question 3

3.1   Almost all students gained some credit in this question, with over three quarters gaining full marks. Most commonly, marks were awarded for support, protection or blood cell production, although ossification and resorption were occasionally seen. Some answers were too vague to gain credit, such as 'structure'.

3.2   In this question students were asked to describe two features of a synovial joint that allow movement, but a small minority simply stated the parts of a synovial joint which was insufficient to answer the question, e.g., ligaments, cartilage and synovial fluid.

       Of the credit worthy answers, the ideas of cartilage as a shock absorber and synovial fluid reducing friction were most commonly seen.

3.3   Only approximately 30% of students gained credit for the movement in a gliding joint. A full range of incorrect answers were seen, such as movement in all directions, rotation and flexion / extension.

3.4   Almost one third of all students gained full credit for explaining what happens when calcium ions are released, and very good and detailed answers were seen. In a very small minority of answers students incorrectly referred to 'active sites', possibly indicating some confusion with enzymes.

       Just over one third of all students did not gain any credit in this question and sometimes this was because they described the sliding filament theory.

3.5   This question discriminated well, with over one third of students gaining one mark and a further quarter gaining two marks. Around a tenth of students gained full credit. The most commonly missed marking point was the second, for the myosin heads changing shape.   A small minority of students were too imprecise in their answers to convey the idea of myosin filaments sliding over the actin filaments.

3.6   Most students gained full or partial credit in this question, with an even distribution between one and two marks. In this question students needed to link relevant features of slow-twitch muscle fibres to the long-distance runner to give reasons why there is a higher proportion, and the full range of possible marking points were seen. The most commonly seen correct answers were for the idea of being slow to fatigue, using aerobic respiration and having many mitochondria.

A small minority of students wrote about the features of the runner instead of the slow-twitch fibres.

3.7   Just under half of all students gained credit in this question for describing how creatine phosphate transfers energy to muscle fibres.   The most commonly seen, one mark answer, was for students recognising that ATP was produced without the specific detail of the creatine phosphate providing the phosphate for this to happen.

3.8   Two thirds of all students did not gain credit in this question, but those students that did gain credit were evenly distributed between one and two marks.

Question 4

4.1   Approximately 90% of all students correctly selected the oxygen saturation in the normal range.

4.2   Half of all students gained full credit for two correct readings and a further third gained one mark, often for the reading for method 2. A common incorrect reading for method 1 was '125'.

4.3   A number of students did not know how to correctly calculate percentage increase or understand significant figures. Commonly students calculated the increase as 39, but then divided this by 95 instead of 56.

4.4   100% of students attempted an answer, with only 4% not gaining credit. Over half of all students gained two marks and a further quarter gained full marks.

A significant number of students used all the information in the question to correctly identify that method 1 achieved oxygen saturation in the normal range but method 2 did not, and all marking points were seen in student answers.

In a small number of cases students discussed the risks of forcing air into the lungs compared to continuous flow but this did not gain credit.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.