LEVEL 3 EXTENDED CERTIFICATE

APPLIED SCIENCE

ASC4: The Human Body
Report on the Examination

1777
January 2019

Version: 1.0

Further copies of this Report are available from aqa.org.uk

General

The paper gave students the opportunity to apply their knowledge and understanding across all six topics of the unit. It was clear, as with last June's exam, that while some students were able to attain very high marks, some aspects of the paper proved to be challenging for the majority of students. Having said this, the overall performance has improved since the exams in January and June of 2018.

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 (there were only a very additional sheets). It was also clear that students had sufficient time to complete the paper as all questions were attempted by the vast majority of students.

Question 1

01.1 47% of all students correctly named the type of joint in the hand as a gliding joint. Common incorrect answers seen were hinge, pivot and condyloid.

01.2 The vast majority of students correctly labelled a bone of the axial skeleton, with 82% gaining a mark here. Most often students labelled the skull or ribs. When students indicated an incorrect answer, it was often for labelling the clavicle or the pelvis.

01.3 70% of all students correctly named the type of joint that only moves in one plane as a hinge joint. Ball and socket, pivot and condyloid were also seen.

01.4 99% of all students gained full or partial credit in this question with 86% gaining maximum credit. The small proportion of students that did give incorrect answers often selected glucose absorption or creatine phosphate production.

01.5 41% of all students gained three marks in this calculation question: this is a significant improvement from the previous exam. Some students calculated the final value as a percentage of the original value and then subtracted this from 100%, giving 31.1 which was awarded full marks as an alternative mathematical procedure.

A further 23% of all students gained two marks based on compensation marking. Often, they incorrectly read the graph or miscalculated the value of the decrease, but then used this value correctly divided by their original value to give a percentage.

16% of all students gained a single mark, most commonly for calculating the 450 decrease only.

01.6 62% of all students gained credit in this question. Phonetic spelling was allowed.

01.7 This question was well attempted with 30% of all students gaining full marks, a further 48% gaining two marks and 20% gaining one mark.

The most commonly described marking points were 2 and 4: the later peak in females and the more rapid decline in females. Many students also gave marking point 3 for the idea that the mass is always higher in males, but a small number gave marking point 1 for the rapid increase initially.

01.8 60% of students correctly described the lower mass of calcium in females causing bones to be weaker. The converse answer for males was also seen and credited. 'Brittle' was not allowed unless qualified here as brittle refers to deformation of a material under stress and some materials are brittle yet very strong.

Question 2

02.1 This question differentiated between students well. 90% of students gained full or partial credit in this question. The most commonly seen marking points were marking points 1, 3, 4 and 7, although all marking points were seen in students' answers.

Some incorrect answers were about the effect of fast-twitch muscle fibres on a person for marking point 3, eg 'they can run fast for short periods of time'.

02.2 96% of students gained at least one mark in this question, often for giving the idea that the number of muscle fibres decreases with increasing age. 19% of students gained two marks as they went on to state that there is variation in the data at any particular age or that the number of muscle fibres is relatively constant through your early 20s.

A small number of students described particular data points or wrote about anomalies in the data, which is incorrect.

02.3 58% of all students gained credit for giving the idea of less active. There was great variety in how they described this.

02.4 This question differentiated between students well, with 32% gaining credit. Those who gave an incorrect answer often referred to haemoglobin or iron.

Question 3

03.1 71% of all students correctly calculated the percentage in this question.

03.2 20% of all students gained full marks in this question for describing the higher protein requirement for girls aged 1–3 due to the faster rate of growth. A further 45% gained one mark, often for the higher protein requirements in girls aged 1–3. But they often gave answers that were too vague for the second marking point or they stated the girls aged 14–18 have stopped growing all together.

03.3 69% of all students correctly selected 'rickets' as the disease caused by a lack of vitamin D. The most commonly selected incorrect answer was scurvy, although both other incorrect answers were selected by some.

03.4 33% of students achieved any credit for this question. Students often gave answers that were either too vague or that were incorrect to gain credit in this question, such as fish, meat, vegetables.

Students would be well advised to generally avoid groups of foods and instead learn 3 or 4 distinctive foods for each vitamin and mineral listed in the specification. For example, dairy as a food was not given here as not all dairy has high vitamin D unless it is fortified. 'Fish' was also not credited as it is only 'Fatty fish' that has high levels of vitamin D.

It seemed that some students had mixed up vitamin C and vitamin D and gave oranges and lemons as their answer. Vitamin D supplement was not credited as the question asked for two 'foods'.

03.5 This question differentiated well with 21% of all students gaining two marks and a further 46% gaining one mark. As in previous years, students should avoid vague 'catch-all' symptoms such as sick and dizzy unless these are distinctive symptoms for a particular disease, disorder or deficiency.

Some students wrote of heart attacks and strokes, but these were not credited as they are not symptoms of hypertension but rather the possible consequences. As always correct biology is credited so ideas related to vision problems or blood in urine were credited when they were occasionally seen.

Of the points on the mark scheme, marking points 1, 2, 5 and 6 were most commonly given by students.

03.6 77% of all students gained credit in this question. Some students referred to the production or creation of energy which was not allowed.

03.7 This question differentiated between students well and 56% of all students gained full credit. A further 34% gained partial credit. Of the marking points on the mark scheme, points 1 and 2 were seen most frequently. A significant minority of students gave the idea of thin cell membranes, but this is incorrect and was not credited.

Question 4

04.1 This question differentiated between students well and 57% of all students gained three marks with a further 26% gaining two marks and 13% gaining one mark. There was no distinct pattern in the results except that a number of students wrote automatic instead of autonomic for the second box and this was not credited.

04.2 57% of all students correctly described the somatic nervous system as that which controls voluntary actions. Those that did not gain credit often gave involuntary actions as their answer.

04.3 This question differentiated well with 56% of all students gaining both marks and a further 18% gaining one mark. Incorrect answers seen often referred to effects of stimulating the parasympathetic nervous system.

Of the marking points on the mark scheme, points 1, 2 and 3 were most commonly given although all other possible correct answers were seen. Again, correct biology is awarded, and the following answers were credited when they were seen: decreased salivation and decreased urination.

04.4 This question differentiated well and 43% of all students gained three marks with a further 15% gaining two and 23% gaining one mark. Many students correctly gave the name of A as the neurotransmitter or vesicle.

Those that did not gain credit for B and / or C often simply stated ‘presynaptic’ and ‘postsynaptic’ which was insufficient. ‘Receptors’ was not credited for C as there are no receptors drawn or visible in the figure. A very small number of students gave ‘nerve’ instead of ‘neurone’ and this is incorrect.

04.5 This question differentiated well with 28% of all students gaining two marks and 27% gaining one mark. Some students described the neurotransmitter moving to neurone Y, but this was insufficient at this level and the method of transport, diffusion, needed to be given.

Choice of words to describe the neurotransmitter binding to the receptor is important as ‘goes to’ or ‘receptor detects’ falls short of the idea of binding / attaching. All three possible marking points were seen regularly.

04.6 This question differentiated between students well. 40% of all students gained full or partial credit. Of the marking points on the mark scheme, points 2, 4 and 5 were most commonly seen in students' answers.

04.7 49% of students correctly gave the change in membrane potential shown in the graph.

04.8 69% of all students correctly selected the 'sodium only' option. The two incorrect options were given in equal number by the students.

Question 5

05.1 90% of all students correctly selected 'Fe^{2+}' as the ion found in haemoglobin. All three incorrect options were selected by some students with Ca^{2+} being slightly more popular.

05.2 82% of all students correctly selected '4' as the number of molecules of oxygen carried by one molecule of haemoglobin. The most commonly selected incorrect answer was '2'.

05.3 80% of all students correctly identified a pulse oximeter as a non-invasive way to measure oxygen saturation. Incorrect answers referred to 'oxygen meter' or were invasive methods, such as blood test.

Phonetic spelling was credited but there was great variation in the spelling and students would be supported by practicing the spelling of some key terms such as this.

05.4 49% of all students correctly identified a sphygmomanometer as the equipment used to measure blood pressure. Again, phonetic spelling was credited but many students could not spell this accurately enough to clearly indicate they knew what the equipment was. As with question **05.3** students would be supported by practicing the spelling of terms such as this.

05.5 84% of all students correctly recognised that the man's oxygen saturation was too low or that he may have had a lung disease. Specified diseases were credited if they would give rise to the lower oxygen saturation reading.

Some students simply stated that the man's lungs were unhealthy or that he has a lung problem, and this was insufficient to gain credit.

05.6 76% of all students gained two marks for this question. 22% gained one mark and this was often for giving an expected value, but the explanation was missing or insufficient.

05.7 This question differentiated between students well. 46% of all students gained full or partial credit. 4% of students were able to achieve all three marks.

Most commonly, students accurately expressed the changing pH in the muscle and the reasons for this (marking points 1 and 2). But for the third point they either missed this idea out or they gave a partially formed idea, eg 'the affinity to oxygen decreases' or 'so oxygen is released to the tissues'.

05.8 This question differentiated well with 82% gaining full or partial credit, of which 5% gained the full three marks. The marking point that was most commonly missed out was marking point 2.

Use of statistics

Statistics used in this report may be taken from incomplete processing data. However, this data still gives a true account on how students have performed for each question.

Mark Ranges and Award of Grades

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

Converting Marks into UMS marks

Convert raw marks into Uniform Mark Scale (UMS) marks by using the link below.
UMS conversion calculator