



LEVEL 3 EXTENDED CERTIFICATE **APPLIED SCIENCE**

ASC4: The Human Body
Report on the Examination

1775
June 2019

Version: 1.0

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General

Numeracy difficulties were evident in a significant number of scripts, with many students unable to calculate percentage decrease. A large number of students made some effort to show working, but their working often lacked structure and clarity.

Students should be encouraged not to repeat or restate the question as this gains no credit.

Question 1

- 1.1 Approximately three quarters of students gained full or partial credit in this question and most commonly students correctly linked part A with the frontal lobe.
- 1.2 Approximately half of all students correctly gave the role of part C, although both possible incorrect answers were seen.
- 1.3 Approximately 60% of students correctly described how the doctor would know by the symptoms the patient was exhibiting and many students gave examples, such as if their vision was affected the doctor would know it was the occipital lobe. A significant number of students also identified the use of MRI, fMRI or a CT scan. Any other methods not covered by the specification were awarded credit if they were correct.
- 1.4 Students were asked to explain how the neurone in the diagram ensures a fast speed of conduction, and therefore answers relating to temperature were ignored. Many students correctly identified the presence of myelin and approximately a quarter of all students went on to explain that therefore the impulse could jump / move from node to node. In some answers, students described the impulse jumping from myelin to myelin which was not credited. A significant number of students correctly used the term saltatory conduction and this was credited for the second marking point.
- 1.5 Approximately 40% of students correctly labelled this diagram and gained full marks. Of the three, it was more common to see the vesicle incorrectly labelled.
- 1.6 Many students could explain the role of acetylcholinesterase as breaking down acetylcholine. Some students weren't clear enough in their explanation that the products of this breakdown are then absorbed back into the presynaptic neurone, or that they were re-uptaken.
- 1.7 Most students correctly identified Alzheimer's and other correct examples were credited.

Question 2

- 2.1 63% gained full or partial credit in this question. Incorrect answers seen included:
- lipase
 - glycogen
 - glucose
 - amino acids
 - fats.
- 2.2 Just over half of all students could correctly name the type of reaction as hydrolysis. Incorrect answers seen included condensation and endothermic.
- 2.3 Students struggled with this question and only around 5% gained full credit in this question. Many students gave answers which related to the role of bile instead and some seemed to think that gastrin itself produces acid/enzymes instead of stimulating their release.
- 2.4 Most students gained at least one mark in this question and most commonly this was for identifying the decrease in lipase activity. Some students also went on to describe the more constant pattern of lipase activity and occasionally students recognised that the orlistat keeps lipase activity lower than that of people taking a placebo.
- A significant minority mixed the graph lines up and gave answers that were the converse, such as orlistat increasing lipase activity.
- 2.5 Only just over 10% of all students gained full credit in this question, with many students seemingly not understanding how to calculate percentage change. Most commonly, students calculated the value for 0.5 hours as a percentage of the original.
- 2.6 This question was an AO2 application question as students are not expected to know about the action of orlistat. Instead, they needed to use the information in Figure 4 and their knowledge of digestion to appreciate that fats and oils are too large to be absorbed in the small intestine and would therefore be egested if the action of lipase is reduced. Approximately 13% of students did this and gained full marks, with roughly 32% gaining partial marks.
- 2.7 Most students correctly gave one or two ways to prevent vitamin D deficiency. Common incorrect answers referred to taking calcium supplements or eating more citrus fruits or leafy green vegetables.

Question 3

- 3.1 Approximately two thirds of students correctly labelled the actin and myosin filaments. A significant minority of students wrote the words above different sections but did not add label lines. To gain credit students must clearly identify which part of a diagram they are identifying by ensuring the end of a label line touches the part they are selecting.

Some students labelled a section with a bracket, but if this included the overlap area then it could not gain credit as it was unclear which filaments the student intended.

- 3.2 A lack of clarity in describing the change in position meant some students failed to gain credit in this question. If describing the filaments as getting closer together, it must be clear in which direction or plane they are getting closer. The best answers described this as the filaments sliding over each other or overlapping more.
- 3.3 A significant number of students described ATP in attaching the myosin head to the actin instead of, or as well as, breaking the bond or detaching the myosin head. The second marking point was for the idea of ATP being used to re-cock the myosin head and this was not seen as often. A significant number of students gained the fallback mark for the idea of ATP being used for the powerstroke, but this is insufficiently detailed to gain 2 marks.
- 3.4 Approximately 10% gained full marks in this question and demonstrated a good understanding. A misconception seen on a fairly regular basis was to describe the calcium ions binding to tropomyosin to cause a shape change, instead of the calcium ions binding to troponin causing a shape change in tropomyosin.
- A number of students failed to gain marking point 1 as they simply wrote about calcium instead of calcium ions. A small number of students wrote about sodium ions which did not prevent them from gaining marking points 2 and 3.
- 3.5 This question was generally well answered with virtually all students gaining full or partial credit.

Question 4

- 4.1 Most students correctly gave one function of the skeleton although a very small number did repeat one of the functions already given in the question. Most commonly students gained the mark from identifying blood cell production.
- 4.2 More students correctly identified A than they did B. For B, a significant minority named it as cartilage which was given in the diagram, or tendon.
- 4.3 Approximately 45% gained credit for the range of motion in this type of joint. Circumduction was a common correct answer.

Question 5

- 5.1 This question was generally well answered with the vast majority of students gaining one or two marks.
- 5.2 Most students gained one mark for recognising that supplement 'A' gave a greater increase in muscle strength than creatine. A smaller number of students also identified the increases for creatine as very small. Marking points 3, 4 and 5 were rarely seen.
- Students are not expected to know about statistical tests but if they gave this idea it was credited.
- 5.3 Students struggled with this question and some simply stated that creatine supplements make ATP without making it clear that is the phosphate that is donated to do so.

- 5.4 Many students correctly identified dopamine as the neurotransmitter that is linked to Parkinson's disease. Other incorrect answers seen included acetylcholine and serotonin.
- 5.5 Most students who gained credit in this question did so for the idea that the creatine phosphate will lead to an increase in ATP or energy available.

Question 6

- 6.1 The majority of students correctly identified the child's oxygen saturation as too low or below the normal range. As the fact that the child has cystic fibrosis was given in the question, no credit was given for concluding that the child has cystic fibrosis.
- 6.2 The vast majority of students attempted answers that related to the first three marking points and not the alternative route, with marking point 1 being that most frequently awarded. For marking point 2 students needed to make it clear that there was a reduction of air or oxygen into the lungs.
- 6.3 Approximately 6% of all students gained credit in this question for knowing that oxygen does not dissolve well.
- 6.4 The vast majority of students correctly answered this question.
- 6.5 Many students simply described the shape of the dissociation curve and how the affinity changes at different points on the curve, without explaining why this happens. This was a challenging question set at distinction level and as such only a small percentage gained full credit. Marking points 1 and 3 were most commonly given.
- 6.6 This question was aimed at the most able students and only 5% gained both marks. Marking point 2 was most commonly given and many appreciated carbon dioxide was involved, but did not make it clear that the carbon dioxide is produced during respiration.

Mark Ranges and Award of Grades

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