OXFORD
INTERNATIONAL
AQA EXAMINATIONS

INTERNATIONAL A-LEVEL BIOLOGY

(9610) Paper BL04

Report on the examination

June 2022

Copyright © 2022 Oxford International AQA Examinations and its licensors. All rights reserved.

REPORT ON EXAMINATION: INTERNATIONAL A-LEVEL BIOLOGY 9610 UNIT BL04 JUNE 2022

Question 1.1

This question was generally well answered, with 50% of students gaining both marks. Most students were able to gain at least 1 mark by correctly stating that mitochondria were involved in the release of energy/ATP production.

Question 1.2

Well prepared students did well on this question, with over 20% getting the maximum 4 marks. Over 50% of students achieved at least 2 marks. Marks were lost when answers focused on the breakdown of acetylcholine and its recycling despite the question asking for the sequence of events in the post-synaptic neurone.

Question 1.3

This question was not well answered and only 2% of students gained 2 marks. The question asked about the importance of the enzyme as opposed to its function, so the breakdown of acetylcholine gained no credit. The second marking point was often lost as it lacked detail in terms of the diffusion of components back across the synapse and their recombination in the synaptic knob.

Question 1.4

Only 10% of students achieved 3 marks. The majority managed to gain MP1 or 2 but very few achieved mp6 as they didn't go on to explain the consequence of over-stimulation. The question asked for suggestions as to why the organophosphates would kill the insects. Those students going down the alternative route of running out of acetylcholine did better since they then linked this to no action potentials and therefore no movement. Too many students simply restated the question by saying 'organophosphates inhibit acetylcholinesterase'.

Question 2.1

Just over 50% of students scored zero for this question, largely because they focused on the type of exercise involved rather than the differences between the fast and slow fibres.

Question 2.2

Over 50% of students achieved at least 1 mark. MP1 was often missing reference to hydrolysis of ATP AND release of energy, with students making only vague statements about breaking down ATP or omitting the release of energy from their answer. MP2 simply needed some reference to movement of the myosin heads.

Copyright © 2022 Oxford International AQA Examinations and its licensors. All rights reserved.

Question 2.3

Just over 56% of students gained both marks for this relatively straightforward calculation. If the instructions were followed, students should have counted 17 or 18 dark fibres and then divided this by the total of 65 fibres but there were a number of calculations that contained neither of these numbers.

Question 2.4

This question was poorly answered with 60% of students achieving zero marks. Too many students wrongly selected sprinters because they believed that fast fibres contained more mitochondria. Those who understood that slow fibres contain more mitochondria usually gained mp1 for identifying marathon runners as having the most slow fibres. Very few students seemed to understand that most respiration will be aerobic in endurance events and so failed to achieve MP2.

Question 2.5

Just under 20% of students achieved 1 mark for this question, usually for MP1. Given that the information above figure 3 stated that exercise and training can change the diameter of fibres, it was unfortunate that more students did not link an increase in diameter of fibres to training. Some students did understand the idea that cyclists and speed skaters have more slow fibres (from figure 3) but they didn't link this fact to the idea that slow fibres may be thicker. The idea that slow fibres contain more capillaries was rarely mentioned. There were some incorrect references to 'making myosin filaments thicker' or to having more of them. There were also many vague references to building muscles due to exercise.

Question 3.1

Despite the scaffolding from figure 4, very few students gave a complete description, so that only just over 1% achieved all 5 marks. Just over 60% did achieve at least 2 marks, usually for MP2 and MP5. MP3 was often not given due to vague references about channel proteins rather than glucose transporter proteins/GLUT4 channel proteins. MP4 was often missing the increased diffusion of glucose into the cell. Although the idea of increased conversion of glucose into glycogen was well known, the fact that this maintained a diffusion gradient for glucose was rarely mentioned.

Question 3.2

Just over 40% of students achieved at least 2 marks. Marks could not be awarded for simply stating 'obesity' rather than an increase in obesity levels and the idea of an increase in carbohydrates in the diet rather than an increase in sugar content. The lack of exercise and increase in obesity were the most commonly awarded marking points, with high blood pressure rarely seen.

Question 3.3

Copyright © 2022 Oxford International AQA Examinations and its licensors. All rights reserved.

This question was well answered, with almost 75% of students gaining 2 marks for correctly identifying a positive correlation between age and incidence of diabetes, with males always having higher numbers.

Question 3.4

Those students who understood that overlapping standard errors indicate no significant difference typically gained both marks. There were some vague references to the 'spread of data' despite the question asking what the error bars indicate about the differences between the incidence of diabetes in males and females. Some students did not refer to the overlap and simply stated that the differences were or were not significant or by stating that the 'results' were significant or not significant so marks could not be awarded. A small number of students were unable to determine which bars were or were not overlapping.

Question 4.1

This question was very well answered with almost 20% of students gaining 6 marks and almost 70% achieving at least 4. There were some incorrect references to DNA being denatured in stage 1 and MP3 was sometimes lost when students simply referred to the addition of primers rather than annealing or attaching. Some students did not gain MP5 as they referred to the production of an 'identical strand' of DNA. Students have clearly been well prepared in the stages of PCR with many correct references to Taq polymerase in stage 3.

Question 4.2

Although 58% of students gained at least 1 mark for some correct calculations, the requirement to give the answer in standard form to 3 significant figures was often missed. The full answer of 4096 was seen in a large number of scripts.

Question 4.3

Although this question was largely AO1, 50% of students did not gain a mark. For those students who did achieve a mark this was mostly for MP2, stating that RNA is converted to DNA. The idea that the viral genetic material is RNA did not seem well known. In addition, there were too many incorrect references to mRNA.

Question 4.4

This question was very poorly answered, with only 16% of students achieving the mark. There were too many vague references to complimentary base pairing without stating that the probe must have a base sequence which is complementary to the target DNA.

Question 4.5

This question was very poorly answered, with only 15% of students achieving the mark. More able students were able to express the idea that more fluorescence means more DNA produced.

Copyright © 2022 Oxford International AQA Examinations and its licensors. All rights reserved.

Question 4.6

This question was poorly answered, with only 8% of students achieving 1 mark. Students struggled with the graphs in figure 7 and those that did identify lower fluorescence in the H1N1 strain were unable to link this to decreased binding of the probe. The idea that the H1N1 strain had mutated and so had different base sequences was rarely recognised despite the question stating that H1N1 was a new strain that emerged in 2009. Students should be encouraged to read the entire question carefully.

Question 4.7

Around 50% of students gained 1 mark, mostly for recognising the need to develop new vaccines. The idea of very little immunity in the population (since it is a new strain) was rarely seen. Similarly, the idea of tracking the progress of an epidemic to allow forward planning was very rarely mentioned.

Question 5.1

Only 19% of students achieved 1 mark. Although the idea of epigenetics changing the function or expression of a gene seemed well known, the idea that the base sequence of DNA remains unchanged was often missing. Statements like ‘a change in gene function without changing the gene’ was very common. The idea that these changes are heritable was very rarely expressed. There were some references to methylation and acetylation, although these did not gain any credit.

Question 5.2

This question was well answered with over 60% of students gaining at least 2 marks. Marks were lost when students referred to endoxifen having the same shape as oestrogen, and binding to the ‘active site’ of the oestrogen receptor.

Question 5.3

Students provided some very confusing answers to this question. The question asked how the RDR enzymes catalyse the production of double stranded RNA using mRNA in the cytoplasm, so references to DNA/RNA polymerases were completely redundant.

Question 5.4

Despite the information provided in figure 10, most students made a good attempt at answering the question with over 60% achieving at least 2 marks. Common errors included binding of the siRNA to an ‘enzyme’ rather than the protein complex clearly labelled in figure 10. Very few students linked the hydrolysis of ATP to the separation of the double stranded siRNA. Large numbers of students successfully achieved MP3, MP4 and MP5 showing a good understanding of the process.

Copyright © 2022 Oxford International AQA Examinations and its licensors. All rights reserved.

Question 6.1

This was a straightforward percentage increase calculation and students performed well, with almost 70% of students achieving 2 marks.

Question 6.2

This was a straightforward magnification calculation and students performed well, with over 50% achieving 2 marks.

Question 6.3

Only 5% of students achieved all 4 marks for this question, but just over 40% did managed to gain at least 2 marks. A large number of students missed MP1 because they simply restated the question saying that ‘ cADPR stimulates the active transport of potassium ions out of guard cells’, and so gained no mark. The idea of increasing the water potential in the guard cells was well understood, as was water leaving the guard cells by osmosis causing a loss of turgidity. Marks were lost by omitting the movement of water down a water potential gradient and by references to stomata losing turgidity. A small number of students thought that making the guard cells turgid would close the stomata.

Question 6.4

Just over 70% of students achieved at least 1 mark on this question, mostly for correctly identifying that the stomatal aperture was wider in the mutated plants. Marks were lost for references to the rate of stomatal closure and for omitting the ‘lack of overlap’ when describing the differences as significant.

Question 6.5

This question was poorly answered with just over 20% of students achieving at least 2 marks. Students failed to read the question as a whole. The photographs in figure 12 should have led the students to the idea of measuring stomatal apertures using a microscope and a graticule, and the graph in figure 13 clearly shows stomatal apertures being measured at different concentrations of ABA. Despite this, many students missed MPs1-4. The idea of carrying out repeats, calculating means and standard errors was also poorly expressed.

Copyright © 2022 Oxford International AQA Examinations and its licensors. All rights reserved.

GET HELP AND SUPPORT

Visit our website for information, guidance, support and resources at **oxfordaqaexams.org.uk**

FAIR ASSESSMENT PROMISE

In line with OxfordAQA's Fair Assessment promise, the assessment design, marking and awarding of this examination focused on performance in the subject, rather than English language ability.

OXFORD INTERNATIONAL AQA EXAMINATIONS
GREAT CLARENDON STREET, OXFORD, OX2 6DP
UNITED KINGDOM

info@oxfordaqaexams.org.uk
oxfordaqaexams.org.uk

Permission to reproduce all copyright material has been applied for. In some cases, efforts to contact copyright-holders may have been unsuccessful and Oxford International AQA Examinations will be happy to rectify any omissions of acknowledgements. If you have any queries please contact the Copyright Team, AQA, Stag Hill House, Guildford, GU2 7XJ.

Copyright © 2022 Oxford International AQA Examinations and its licensors. All rights reserved.