Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

Summer 2025

Pearson Edexcel Advanced Subsidiary
In Biology (8BI0) Paper 01 Core Cellular Biology and Microbiology.

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Introduction

This paper was representative of previous 8BI0 01 papers with a range of questions on many of the key topic areas. The paper performed well, and the candidates achieved higher marks than previously scored. Candidates scored well on the questions that demanded basic factual recall and simple maths questions but struggled with the specific details relating to the practical-based questions and the multi-stepped maths questions. The analysis and levels-based questions where interpretation of the information was required tended to score poorly, often with candidates simply restating the information provided in the question stem, rather than drawing together the specific details of the question with the subject knowledge from the specification.

Question1

Q1ai) Most candidates correctly drew the -OH and -H on C1, but fewer were able to correctly label the remaining molecule. Common errors included two hydroxyl groups on carbons and additional groups drawn onto the O within the ring.

Q1b) The better candidates scored here, as they understood that if the molecule was made up of three monosaccharides it would involve the loss of two water molecules as a result of condensation reactions joining them together.

Question 2

Q2ai) Most candidates were able to correctly identify the complementary base pairs, but these were often attributed to the incorrect base pairs as shown on the diagram. A number of candidates simply gave the letters of the bases (A, T, G, C) instead of naming them.

Q2aii) Most candidates correctly identified the bonds labelled D and E. A few candidates identified bond F correctly; some came close by describing it as a glycosidic, rather than N-glycosidic bond

Q2b) Many candidates were able to correctly describe semi-conservative replication as forming new molecules, each with one old and one new strand. Some candidates lost the mark for stating that it was half the original strand and half the new strand, which could also describe dispersive replication. It seems that there is some confusion about what is a strand of DNA and what is a DNA molecule.

Question 3

Q3aiii) Many candidates described the high resolution of an electron microscope, but fewer were able to provide the reason why. Several answers identified the higher resolution but had the electrons having a longer wavelength.

Q3aiv) most candidates correctly identified a correct double membraned organelle.

Q3bi) Candidates described mitosis and the creation of two daughter cells or the need to share mitochondria, but did not explain why more mitochondria are necessary.

Q3bii) This question was not answered well. Some candidates identified the replication of DNA, but invariably they went on to describe the different stages of mitosis rather than the division of the mitochondrion.

Question 4

Q4a) Some students produced some accurate biological drawings – an improvement on last year; however, many shaded in the nuclei or did not draw the cell walls of the cells surrounding the main cells which negated mp1, and some did not follow the instruction that the drawing needed to be x2.

Q4b) In the first of the levels-based questions most candidates achieved at least level one. A significant number achieved a mark in level three. The better responses included specific details of the range of potassium ion concentrations (at least 5), had clear control variables, described how the width of the stomata would be measured and what would be done with the data collected. Some students did not appreciate that they were asked to measure the effect of potassium ion concentration on width of stomata and described using onion cells, instead of leaf cells, or collecting stomata and testing the effect of potassium on them. Students also lost marks by giving a range of concentrations, but with no suggestion as to the units, and for describing a control variable as the amount of water/ amount of light, rather than volume of water/light intensity.

Question 5

Q5a) Most candidates identified the fact that water was a polar molecule, with the better answers describing it as dipolar. References to the formation of hydrogen bonds were frequently made, although some answers did not have them forming between the water molecules. Some candidates just described the different properties of water, including its specific heat capacity and latent heat of vaporisation, instead of its role in creating surface tension.

Q5bi) Many candidates gained one mark here by describing the distribution of weight over a larger area. The better answers described the lower downwards forces meaning that the H bonds were not broken (between the water molecules). Some students incorrectly described the mosquitoes as being less dense than the water, whilst others simply referred to the mosquito not breaking the surface tension without providing the reason why.

Q5bii) Most candidates gained mp2 by describing the disruption of H bonds between water molecules, but they often didn't link it to the reduction in surface tension resulting in the sinking of eggs. Incorrect answers referred to kerosene being less dense than water which was why the eggs sank.

Q5ci) The requirement of giving the answer to one decimal place resulted in there being two possible responses, depending on where the measurements were taken. Many candidates achieved 2 marks by calculating the decrease in surface tension correctly and presenting their answer correctly (standard form and 1 decimal place). A few students performed the correct calculation, but did not present their answer correctly. Incorrect responses included students dividing their change in surface tension by the incorrect change in temperature, or by having their change in surface tension out by a factor of 10 by not reading the scale correctly.

Q5cii) Overall this question was answered well, although a number of candidates only described the energy unqualified increasing, which would be the case with heat energy if the temperature increased; the conversion of heat energy to kinetic energy should be specified to illustrate the increase in molecular movement.

Question 6

Q6bi) This question was not answered well. Candidates tended to describe the range of germinating seeds rather than the range of temperatures, which did not address the question asked. Surprisingly few identified that the range of temperatures used was the same for both species A and species B. The better responses illustrated the fact that the range of temperatures needed to be extended above and below the current range.

Q6bii) Few candidates identified the need to devise an investigation that focused on the range of temperatures around the optimum temperature from the previous investigation. Most candidates described the control measures and repeats, but generally the level of detail included was too brief. Some candidates clearly had not read the question correctly and simply focused on analysing whether the conclusion was valid.

Q6c) Many candidates gained at least one mark on this calculation, but few gained two marks as they did not present their answer to one decimal place. Some candidates interpreted the information given, to describe the calculation, incorrectly, as they attempted to use $_{t}$ and $_{t+10}$ as additional numerical values in the calculation.

Question 7

Q7b) Many responses either indicated that viruses were non-living or that they hid/replicated inside cells, but fewer went on to provide the reason why this made them hard to treat. Only a few answers referred to their high antigenic variability, again with a limited number of responses linking it to the impact on the effect of medication.

Q7ci) The majority of candidates achieved at least one mark here. The most commonly seen answer highlighted that the highest number of cases occurred in 2014, but it was often accompanied with the converse conclusion of the cases being low before 2014 instead of identifying another conclusion that could be drawn.

Q7cii) This question was answered well by the vast majority of candidates.

Q7ciii) This type of question frequently occurs and it is standard practice when presenting the ratio of one quantity to another to report it in the form x : 1, with x being found by dividing the first quantity by the second. All too frequently candidates simply rewrote the numerical data provided in the question with no manipulation.

Q7d) In the second of the levels-based questions most of the mark points were achieved, although rarely within the same answer. Candidates were required to analyse the information provided to discuss measures that could be used to reduce the risk of Ebola outbreaks. Most candidates focused on the ways to reduce transmission between people and animals, with detail about quarantining/PPE and sanitation. The better answers included some level of discussion about the other aspects of possible methods of disease spread, as well as highlighting some of the issues in being able to implement these preventative measures. It was surprising that a number of candidates described the use of antibiotics to treat the infection, given the fact that Ebola is a viral infection.

Question 8

Q8a) The vast majority of responses correctly drew the amine and carboxylic acid groups on the correct sides of the central carbon, but a few did have them the other way round, as well as including the H attached to the central carbon. A few candidates failed to score as a result of drawing incorrect structures.

Q8c) Many candidates identified the fact that the active site of an enzyme is not complementary to the shapes of all substrates, but fewer went on to describe that because the conversion was not a single step process the shape of the intermediates was changed.

Q8di) Very few responses gained full marks here. Incorrect answers simply described the effect of competitive/non-competitive inhibition in generalised terms, whilst others talked about isoleucine production being inhibited. Candidates need to be more specific in their descriptions of inhibition; they are expected to detail the effect of inhibitors binding to (allosteric) sites causing a conformational change of the enzyme as a whole and the subsequent change in the shape of the active site, rather than unqualified changes in the active site.

Q8dii) Most candidates gained mp1 with a line that increase in a sloping fashion, but fewer gained mp2 with the line staying flat (overall), and only a small number gained mp3.

Paper Summary

Based on their performance on this paper, students are offered the following advice:

- read the whole question carefully, including the introduction, to help relate your answer to the context asked. In particular, make sure you are answering the question asked, rather than restating the information provided as an answer;
- use information provided in the question to help you with your answer, e.g. graphs and tables of data including the labelling;
- 'explain' questions require your answer to have the reason for the process/pattern included. Using the word 'because…' will help you to provide a sufficiently detailed response;
- aim to adapt your description of practical procedures to consider the specific context that has been provided to you in the question;
- set out calculations carefully showing each stage of your working in case a mistake is made at the final step and check that the magnitude of the answer makes sense in the context of the question;
- be specific in your vocabulary, avoiding vague terms such as amount, and use something measurable with an appropriate scientific quantitative value;
- diagrams should be drawn accurately to represent exactly what is being drawn and the rules governing biological drawings should be followed;
- all questions should be attempted and leaving blanks avoided. Careful reading of the information should reduce the chance of questions being missed;
- look at the appendix 6 and 7 of the specification to familiarise yourself with the command words and the examples of the mathematical calculations you are expected to be able to perform at AS level.

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