Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

Summer 2025

Pearson Edexcel Advanced Subsidiary
In Biology (8BI0) Paper 02 Core Physiology And Ecology.

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Introduction

This paper was representative of previous 8BI0 02 papers with a range of questions on many of the key topic areas within the AS syllabus. It also gave them the opportunity to apply this knowledge and understanding to new situations and novel contexts. There was no evidence of students being short of time. 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 application of facts to novel concepts. 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.

Question 1

Q01(b) This question was not well answered. Candidates often had confusion about oxygen and sodium being polar and large. Few candidates were able to give explanations linking the properties with how they moved into the cells.

Question 2

Q02(a)(i) Most candidates were able to complete the calculation to work out the magnification on the diagram given.

Q02(a)(ii) Candidates lost marks for not giving reasons for the differences between the artery and vein or not providing direct comparisons but rather making individual statements about one or the other. Candidates therefore missed the second part of each marking point eg not stating it was thicker due to the smooth muscle and elastic fibres.

Q02(c)(i) Candidates were able to give a reason, but some did not elaborate enough to gain a mark. Some candidates missed the comparative element of the question so did not state why it is worse to have a blood clot in an artery and focused just on the problems associated with a blood clot.

Q02(c)(ii) Many candidates simply described or listed three risk factors to do with lifestyle but did not go onto explain why they posed a risk. Other candidates repeated back the stem of the question or talked in very general terms like "unhealthy diet" rather than focusing on specific risk factors.

Question 3

Q03(b)(ii) This question was mostly answered well, although several candidates incorrectly had the blood flowing from left to right rather than right to left.

Q03(b)(iii) This question was answered well with most candidates being able to give one or two comparisons. Some candidates did not use comparative statements instead just writing a series of facts about fish circulatory systems then mammal circulatory systems. A significant minority confused gas exchange systems with circulatory systems talking about counter currents in fish.

Question 4

Q04(a) This question was poorly answered by candidates who were not able to state the differences between two types of speciation. Most talked about the difference in speciation methods being a result of reproductive isolation rather than stating how the isolation occurs in the two different scenarios.

Q04(b) The majority of candidates could explain the steps in natural selection well using the correct terminology. Some candidates confused natural selection with speciation. The first two marking points were commonly lost due to not using the given context of the question and instead talking in general terms about the process of natural selection. Candidates must modify their explanations to take into account the context of questions to gain higher markers.

Q04(c) This was the levels-based question. Most candidates scored Level 1 in this as they didn't use the context in their answer or just restated the raw data they had been given. Candidates need to remember to analyse the data by giving the patterns the data is showing not quoting raw data in their answers. For Level 2 candidates needed to state some of the patterns seen in the data referring to the differences between the different behaviours. Level 3 needed candidates to further appreciate the limits within the data and was rarely seen.

Question 5

Q05(a) Most candidates gained this mark with few candidates confusing genus and species.

Q05(b)(i) Many candidates misunderstood the requirement of this question to explain the shape of the curve, instead candidates focused on what different points on the curve meant. A few students appreciated the S curve was a result of cooperative binding but were unable to go further to explain what they meant and how it related to the shape of the curve. Rarely did candidates relate the binding of oxygen to changes to the shape of Hb.

Q05(b)(ii) Most candidates were able to successfully complete this calculation with some trying to incorrectly work out the percentage change instead.

Q05(b)(iii) Many candidates were able to score on this question. Some candidates did not appreciate the significance or explain well the importance of "at the same partial pressure" needed to gain the second marking point.

Q05(c) This question was poorly answered, with many candidates leaving the answer blank. Candidates were frequently comparing vicunas with horses, left over from the last question, rather than the horses with llamas. There was poor use of scientific terms with statements about the animals being saturated with oxygen rather than haemoglobin or a general lack of comparative language. Some candidates tried hard to create ideas instead of sticking to the specification to answer the question.

Q05(d) Most candidates were able to provide a reason why the mouse dissociation curve is to the right of the horse, many using surface area to volume ratio as their answer. Few assumed because the mouse is smaller it therefore has a smaller metabolic rate. Some maintained the train of thought from previous questions and talked about oxygen affinity rather than reasons for the curve being to the right.

Question 6

Q06(a) Many candidates were able to successfully define osmosis, but a few confused it with active transport. Candidates should be encouraged to talk about osmosis in terms of water potential rather than concentration of water.

Q06(b)(i) Most candidates were able to successful calculate the volume of the cylinder. Many candidates didn't realise a ratio was to be given or that the answer should be given to one decimal place. Candidates should also remember ratios should be given where the smallest answer should be expressed as 1. As a result, many candidates put 17.3:3.9 as their final answer.

Q06(b)(ii) Many candidates did not attempt this maths question instead leaving it blank. Those who did often made the mistake of adding all the values up and then taking away the mean. Many candidates also made rounding issues treating 1.1169 as 1.11 instead of 1.12.

Q06(b)(iii) Many candidates relied on GCSE level knowledge to answer this question which led to low marks. Candidates need to be specific about locations of where water is moving to and from as well as being more precise with their scientific language to explain key concepts like osmosis. Some talked generally about energy rather than specifically about kinetic energy. Few students talked about the impact on bonding. Where candidates are asked to analyse the data, they should expect to give a pattern within the data to start their answer before moving to explain it. Candidates were given two data sets in this question so should expect to give two patterns in their answer.

Question 7

Q07(a) Most candidates thought transpiration was the movement of water through the plant rather than the evaporation of water from the leaves. Some who correctly knew what transpiration was missed 'evaporation' from their answers.

Q07(b)(i) Some candidates were able to give excellent answers to this question but most lacked detail. Most candidates identified the increase in transpiration but did not then go on to say about a decrease later in the day. Some realised the link of light during the day with stomata opening and closing and hence transpiration being able to occur, but few were able to link the times of the day with temperature and kinetic energy.

Q07(b)(ii) Most were able to gain some marks on this question, but many lacked detail in their answers or focused on quoting data and restating the question stem resulting in them failing to gain any marks. There was some confusion about soil temperature and air temperature with some candidates failing to distinguish between the two. Lots of candidates were trying to make the data fit what they thought should happen rather than explaining the data presented to them in the question.

Q07(c) Most candidates were familiar with the potometer practical. Some answers lacked detail, for example failing to state the type of potometer being used or just saying repeating, rather than stating a minimum number of repeats. Many candidates failed to take the context of the question into account, so were lacking clarity on exactly what was being measured or were failing to state exactly how to change the light intensity.

Question 8

Q08(a) Many candidates were able to answer this question well but some got confused thinking a larger animal has a larger surface area to volume ratio. While most were able to link structures to improving diffusion rate, few were able to give explanations for this, instead stating the structures were more efficient only.

Q08(b) A poorly answered question. Few were able to say anything about the gas exchange systems instead focusing on which gasses needed to be exchanged. The most commonly seen mark was about exchange surfaces creating large surface area to volume ratios. Most did attempt to directly compare their answers.

Q08(c)(i) Most candidates were able to state the independent variable with a few confusing it with the dependant variable.

Q08(c)(ii) Many candidates left this question blank with many others just quoting the data rather than comparing the data, looking for patterns and providing a critique.

Q08(c)(iii) Many candidates were able to gain a mark on this question for stating how to vary the temperature of the syringe. Where candidates lost marks they had appreciated the temperature needed changing but did not give any methods of how to do this and few considered the need to keep the previous independent variable of gas composition the same for the modified experiment.

Summary Section

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

- ensure that you read the question carefully and ensure the context of the question has been taken into account rather than constructing general fact-based answers
- when stating differences or similarities direct comparative statements must be used
- write in detail and use correct and precise biological terminology
- carefully revise core practical work and methods
- when asked to analyse data do not just restate the raw data rather look for trends and patterns and seek to explain why the patterns have occurred
- make sure you are familiar with the maths skills associated with the specification section and understand and have practiced using formulae and show all stages of working out.

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