

Examiners' Report

Principal Examiner Feedback

Summer 2022

Pearson Edexcel GCE

In AS Biology (8BI0_01)

Paper 1: Core Cellular Biology and Microbiology

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Summer 2022
Publications Code 8BI0_01_pef_20220818*
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Introduction

This paper was fairly typical of previous 8BIO1 papers with a range of questions on some frequently tested topics and some less frequently covered spec points. The paper performed as expected with most mark points being awarded, despite the low number of candidates that sat this paper.

Candidates tended to score well in the more straightforward recall questions and simple maths questions but struggled with the practical-based questions and the two- or three-step maths questions.

Question 1

Magnification calculations are a relatively frequent occurrence and candidates have clearly been prepped on how to do them. In the calculation in part (a) we did expect candidates to choose a sensible value in which to express their answer. We felt that this should be to the nearest whole number.

The question in part (b) was based on core practical 2 and was not so well done. Many candidates could not accurately name the graticule and stage micrometer and many could not remember which piece of equipment was used to make the measurement and which was used for calibration. The more able candidates gave some very detailed accounts of how to calibrate the graticule which unfortunately went beyond the requirements of this question.

Question 2

The two multiple choice questions in (a) and the calculation in (b) did not cause too many candidates a problem. The practical-based question scored poorly and it was rare for candidates to score more than one mark (mark point 4). Mark point one should have been fairly straightforward to achieve but a common mistake was to repeat the stem of the question and state that the melting point was measured. Barely any candidates picked up on the fact that there were two independent variables to stated that 'fatty acids of different lengths and saturation should be used'.

Question 3

This question used a slightly different context for assessing spec point 2.3 but the majority of candidates attempted it. The multiple choice in (a) and the calculation in (b) did not cause too many problems and completing the diagram in part (c) was attempted by most, although the need for a scale diagram was missed by many. Part (d) was a challenging question, targeted at the more able candidates. Mark point 1 should have been very accessible but few candidates could tell us that crossing over occurs between the chromatids. We saw attempts at mark point 2 but rarely the third mark point.

Question 4

Candidates are familiar with questions on the phospholipid bilayer but a relatively high proportion of responses just described the arrangement of phospholipids, not explaining why they are arranged specifically, as required by the question.

In (b) we saw the expected confusion between magnification and resolution. Candidates made good attempts at the calculation and our mark scheme allowed for quite a range of answers to allow for the varying places that measurements could be taken from on our photograph.

Part (c) was well-answered with a high proportion of candidates realising that the question was really testing them on the functions of the various organelles. Most read the question and used the mark allocation to explain three differences, but a number of candidates wrote about more to maximise their chances of scoring highly.

Question 5

Candidates who looked carefully and thought about their response before ticking a box did well on the multiple choice in (a). The wrong distractor most frequently selected was D, not surprisingly.

In part (b)(i), many candidates identified that the differences in temperature was due to the high specific heat capacity of water but only the more able candidates could explain this in terms of H bonds and energy requirements. Few candidates seemed to be aware of the significance of these small temperature changes to aquatic organisms so part (ii) was poorly answered. Similarly in part (c), candidates identified that the work relied on the incompressible nature of water for movement but could not take their response much further.

Question 6

The question in part (a) was barely higher than a GCSE question but very few candidates told us that the cells in a tissue were similar. Their descriptions of an organ were better.

The range of diagrams seen in response to (b)(i) were vast, ranging from a cross with no labels to fully labelled diagrams of a whole cell in metaphase. Diagrams were carelessly labelled with label lines not even touching the diagram itself. Candidates had no problems in describing the events in metaphase however.

Despite all our clues in part (b), very few candidates could interpret the data in (c)(i). The more able candidates suggested the effect that colchicine was having on the spindle fibres and realised that the cells would be unable to move into anaphase as they were stuck in metaphase.

Part (d) was loosely based on core practical 3. Some candidates tried to apply their experience of this practical to the question and picked up the staining mark and

the counting mark. Others wrote everything they knew about a root tip squash preparation and picked up the staining mark as well.

Question 7

Questions on protein structure have asked on more than one occasion in the past and those candidates who had been prepared for this exam using past papers knew the story that we were after in part (a), with the first three mark points being the most frequently awarded.

'Compare and contrast' was a new command word to this spec and caused candidates problems in earlier series. However, it was apparent that centres have taken on board the meaning of this command word and have trained their candidates well. We saw some high-scoring responses to this question, with actual comparisons and not two descriptions, which was common in the past. In part (ii) many candidates realised that we were testing them on the degenerate nature of the genetic code and could use this term and explain its meaning, gaining at least two marks on this question. A few candidates referred to the degenerative nature of DNA or the bases so could not be awarded the second point.

Question 8

The two multiple choice questions in (a) did not cause many candidates a problem. There were some good responses to part (b) with candidates picking out the idea of using sugar solutions of the same concentration, although a few 'amounts' crept into some answers. A number of candidates also realised that the mouth needed cleansing between tastings. Our third mark point was rarely awarded; candidates did not pick up on the fact that the data in the table had been expressed as relative to sucrose.

In (c)(i) we saw all sorts of expressions for the ratio. A relatively high number of candidates still do not appreciate that one of the values in a ratio must be a 1. Part (ii) was the first of our two levels-based questions on this paper. Candidates are getting better at structuring their answer and many candidates talked about the information in the table and in the graph. The less able candidates wrote about the sugar content or sweetness of individual fruits but the more able candidate tried to make generalisations and links between the two sources of data, which was what we required for the higher-level marks

Question 9

Candidates do find remembering the details of spermatogenesis and oogenesis very difficult so these two multiple choice questions in (a) did not score as highly as some of the others.

Responses to part (b) surprised us as the question was not particularly complicated but candidates clearly had not considered the role of centrioles in the zygote and did not equate their knowledge of cell organelles with this role.

Our second levels-based question was very easy for candidates to structure their answer to and we saw lots of responses where candidates worked their way down our list of factors in turn. The weaker candidates tended not to link the factor in with why fertility could be affected and only the more able, well-schooled candidates used the information in the diagrams in their answer.

Paper Summary

The following advise is offered to help fully-prepare candidates for future exams:

• read the whole question carefully, including the introduction, to help relate your answer to the context asked. Quite often, early parts of the question will be designed to give you clues to latter components which might appear more obscure due to an unfamiliar context

• use all of the information provided in the question to help you with your answer, e.g. graphs and tables of data including the labelling; this especially important in the levels-based questions

• when asked to explain your answer make sure you have effectively included terms such as because, so, therefore, as a result, in your response

• 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 and the units makes sense in the context of the question

• be specific in your vocabulary avoiding vague terms such as amount and use something measurable such as volume or mass

- diagrams should be drawn accurately to represent exactly what is being drawn and the label lines should just be touching the structures that they are pointing to

- all questions should be attempted and leaving blanks avoided

• 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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