External Assessment Report 2014

Subject(s)	Biology
Level(s)	Higher

The statistics used in this report have been compiled before the completion of any Post Results Services.

This report provides information on the performance of candidates which it is hoped will be useful to teachers/lecturers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding. It would be helpful to read this report in conjunction with the published assessment and marking instructions for the examination.

Comments on candidate performance

General comments

There was an increase in entries for Higher Biology this year and the **general performance** of candidates in the 2014 examination was good although there was a slight decrease in the pass rate and reduction in the percentages of all grades awarded. The average score for Section A was 20.66 from 30 and for Sections B and C combined the average score was 54.87 from 100.

Literacy levels were good and the improvement in answers to Extended Response questions in Section C was sustained this year. Candidates continue to have difficulty with the use of comparative terms such as lower and higher when describing differences between measurements or observations. There was, as in previous years, evidence of confusion between the need to simply describe results or to provide explanations for them.

Spelling of biological terms was generally good, but concern was raised by markers with the terms ‘glycolysis’ and ‘phototropism’.

Numeracy levels were good, but candidates should continue to be aware of the need to include **units** in answers that involve describing trends in data. The presentation of data was good this year, including good graph scaling and axis labelling. There was, again, a very good response to questions that required calculation. In describing trends in data, candidates should be aware of the crucial importance of **changes** in data trends and the need to quote figures and units when describing these.

As always, certain questions are designed with the specific intent that they challenge candidates and allow the demonstration of knowledge and skills related to Grade A. These questions are listed below.

Section A: Questions 1, 3, 7, 11, 14, 17, 19, 25, 27

Section B: Unit 1 Questions 1(e) [1 mark]; 2(c)(i) [1 mark], 2(c)(ii); 3(b)(ii); 4(a) and 4(d); Unit 2 Questions 5(a) [1 mark], 5(c), 6(a)(i) [1 mark], 6(a)(iii), 6(b)(i), 6(b)(ii) [1 mark], 6(b)(iii); 7(a) [1 mark]; 8(a) [1 mark]; Unit 3 Questions 10(b); 12(b)(i) [1 mark], 12(b)(ii), 12(c), 13(a)(ii) [1 mark], 14(a)(i), 14(a)(ii).

Section C: Some extended response marks, often those with two part explanations, are designed to be more demanding than others.

Areas in which candidates performed well

Section A

Candidates performed especially well in Questions 2, 6 and 8 from Unit 1; Question 13 from Unit 2 and Questions 22, 24, 26, 29 and 30 from Unit 3.

Section B

The following questions were answered well:

- Question 1(a), (b), (c) and (d) — as might be expected with familiar contexts.
- Question 2(b) — most candidates linking chlorophyll with the absorption of red and blue light.
- Question 3(c) — many opting to use the abbreviation ER both for the structure and its vesicles.
- Question 4(c) — excellent response to a question in which mistakes would have been easy to make.
- Question 6(a)(ii) — (data question) selection and processing well combined.
- Question 8(b)(ii) and Question 8(c)(ii) — distinction between 'tolerating' and 'discouraging' was noted by most candidates.
- Question 6(b)(i) — good knowledge in a slightly unfamiliar context.
- Question 9(b)(i) and (ii) — evidence of a well-revised area.
- Question 11(c)(i) and (ii) — the benefits of induction in the control of gene action were noted by most candidates.
- Question 12(e) — (practical setting) simple prediction by extrapolation was dealt with well.
- Question 13(a)(iii) — another well revised-area.
- Question 14(b)(i) and (ii) — though many candidates thought etiolation was a response to intense light.
- Question 14(a) and (b) — excellent responses as expected.

Section C

The extended responses were answered excellently again this year, and the improvements in this section seen in recent years were sustained.

Candidates very strongly favoured Question 1A on Mutations over Question1B on Plant Adaptations, and the average marks for Question 1A was higher. Many candidates sensibly used a systematic approach to dealing with the different mutations and their effects. There was very little evidence of confusion between xerophytes and hydrophytes in answers to 1B, though it was an issue for some candidates.

Candidates favoured Question 2A on Photosynthesis over Question 2B on Plasma membrane and cell wall, and the average mark for Question 2A was higher. Many candidates seemed to have well-prepared answers to questions 2A and 2B and made sensible use of diagrams.

Areas which candidates found demanding

Section A

Candidates had more difficulty with Questions 1, 3 and 7 from Unit 1; Questions 11 and 17, and 20 from Unit 2.

Section B

- Question 1(d) — many candidates did not link the release of energy to the activity levels expected from muscle cells.

- Question 2(c)(i) — candidates often failed to note the point in the data where the trend changed, and so did not quote a figure from the table.
- Question 3(a) — there was difficulty for some candidates who had read it as 'cellul**o**se' rather than 'cellul**a**se', and so classified it as structural.
- Question 4(a) — candidates found the double axis extremely challenging and failed to link the appropriate axis with its own graph line.
- Question 5(a) — the context of the question was difficult for many candidates, and although many appreciated the significance of a common ancestor they could not describe the link between pollinator and flower tube characteristics.
- Question 5(b) — there was evidence that many candidates failed to read the stem of the question.
- Question 6(a)(i) — candidates did not appreciate the need to use units in describing graph trends.
- Question 6(b)(ii) — candidates struggled to follow the explanation through from the link between the presence of the toxin and reduced leaf damage allowing more photosynthesis to the increased yield.
- Question 6(b)(iii) — the multi-step calculation proved very challenging.
- Question 6(b) — the need for explanation was not noted by many candidates who simply described what the adaptations would do to the plants.
- Question 7(a) — the context was difficult for many candidates and they failed to mention **survival** of resistant individuals to breed and pass on their resistance to offspring.
- Question 7(b) — many candidates failed to note that this is a comparative situation and the population of *E. coli* in antibiotic A is high**er** than in antibiotic B at the start.
- Question 8(b)(i) — many candidates thought that the levelling out of the graph at high grazing intensity was evidence in itself.
- Question 10(a)(i) == many candidates did not realise that this is another comparative situation where the larg**er** diameter of cell A compared to B has to be emphasised.
- Question 10(b) — many candidates described the differentiation of xylem in structural terms, suggesting they may have been over-taught this, but failed to emphasise the genetic basis of differentiation in terms of the switching on or off of specific genes.
- Question 11(b) — many candidates offered protein synthesis as an answer, although the question asked about the process by which mRNA is involved in the synthesis of protein.
- Question 13(a)(i) — many candidates did not appreciate the need to emphasise that the experiment would need to be repeated in exactly the same way as well as to include magnesium in the culture solution.
- Question 15(c) — many candidates failed to link the difference they described with the community to which they were referring.

Section C

Question 1A — some candidates were confused between genes, bases and amino acids, and this confusion spoiled what were essentially well understood ideas.

Question 2A — candidates often failed to give enough detail on chloroplast structure, assuming that the names of the stroma and grana were enough. In drawing diagrams of the Calvin cycle, arrowheads are needed to show the reactant and products of individual chemical reactions.

Advice to centres for preparation of future candidates

- As advised in previous reports, it is good practice to ensure that candidates attempting Higher Biology have appropriate prior attainment at SCQF level 5.

- It is worth sharing with candidates the points made in this report and in reports from previous years. The 'Areas candidates found demanding' sections could be especially helpful.

- In instances where candidates have Assessment Arrangements such as scribing and transcribing, it is essential that the papers returned to SQA clearly indicate their origins and that any loose inserts are securely attached to the question paper.

- Candidates should be reminded that the legibility of their writing is important. Legibility is often improved by trying to increase the size of the characters.

- It is highly recommended that candidates are given the opportunity to work with published Marking Instructions from previous years' SQA question papers. This may help, for example, in the pitching of answers to questions involving standard explanations, such as the adaptive radiation of species, the idea of evolution by natural selection, and the impact of gene mutation on protein structure.

- Use of the vocabulary offered in the Arrangements documentation continues to be important, for example the use of the terms 'translation', 'reduction' and 'phototropism'.

- Use of comparative language is expected when appropriate, and the difference between nominative terms such as 'large' and the comparative 'larger' should be emphasised. Candidates should be encouraged to think carefully when using words such as 'always', 'never' or 'none'.

- Candidates should be reminded that references or descriptions of data should include the **units** and should always make changes in data trend clear using actual values from the data itself.

- Practical work continues to be important in Biology, and candidates should continue to be exposed to apparatus and experimental procedures appropriate to their studies. There is a need to emphasise the design of control procedures and how best to describe these in examination responses.

- Choice of extended response questions is important and candidates should be encouraged to spend a few minutes making the best choice for them. Study of Marking Instructions from past years is highly recommended.

Statistical information: update on Courses

Number of resulted entries in 2013	9964

Number of resulted entries in 2014	10197

Statistical information: Performance of candidates

Distribution of Course awards including grade boundaries

Distribution of Course awards	%	Cum. %	Number of candidates	Lowest mark
Maximum Mark 130				
A	25.0%	25.0%	2547	90
B	21.9%	46.9%	2238	76
C	22.2%	69.2%	2267	62
D	10.0%	79.2%	1020	55
No award	20.8%	-	2125	-

General commentary on grade boundaries

- While SQA aims to set examinations and create marking instructions which will allow a competent candidate to score a minimum of 50% of the available marks (the notional C boundary) and a well prepared, very competent candidate to score at least 70% of the available marks (the notional A boundary), it is very challenging to get the standard on target every year, in every subject at every level.

- Each year, SQA therefore holds a grade boundary meeting for each subject at each level where it brings together all the information available (statistical and judgemental). The Principal Assessor and SQA Qualifications Manager meet with the relevant SQA Business Manager and Statistician to discuss the evidence and make decisions. The meetings are chaired by members of the management team at SQA.

- The grade boundaries can be adjusted downwards if there is evidence that the exam is more challenging than usual, allowing the pass rate to be unaffected by this circumstance.

- The grade boundaries can be adjusted upwards if there is evidence that the exam is less challenging than usual, allowing the pass rate to be unaffected by this circumstance.

- Where standards are comparable to previous years, similar grade boundaries are maintained.

- An exam paper at a particular level in a subject in one year tends to have a marginally different set of grade boundaries from exam papers in that subject at that level in other years. This is because the particular questions, and the mix of questions, are different. This is also the case for exams set in centres. If SQA has already altered a boundary in a particular year in, say, Higher Chemistry, this does not mean that centres should necessarily alter boundaries in their prelim exam in Higher Chemistry. The two are not that closely related, as they do not contain identical questions.

- SQA's main aim is to be fair to candidates across all subjects and all levels and maintain comparable standards across the years, even as arrangements evolve and change.