External Assessment Report 2012

Subject(s)	**Biology**
Level(s)	**Higher (Revised)**

The statistics used in this report are pre-appeal.

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 question papers and marking instructions for the examination.

Comments on candidate performance

General comments

This was the first examination of the Revised Arrangements for Higher Biology. There has been significant change to the content of the revised Higher although the Problem Solving skills remain similar to those in the unrevised Higher. Uptake of the revised Higher Biology was low with two centres presenting candidates for the exam. There was excellent performance from some candidates who were well prepared and knowledgeable in the Revised Arrangements. However, there were a number of candidates whose performance was poor in both Knowledge and Understanding and in Problem Solving skills.

Literacy levels of candidates who sat the revised examination were as good as those who sat the unrevised examination. However, general numeracy levels seemed less strong when applied to calculations, for example percentage change.

Note

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 3, 7, 8, 15, 16, 21, 24, 26 and 29

Section B

Unit 1

Question 1 (a)(ii)(1), (a)(iv), (b)(ii)(1)
Question 2 (c)(ii)(1)
Question 3 (a)(ii)(1), (b)(ii)(1), (c)(iii)

Unit 2

Question 4 (e), (f)(1)
Question 5 (d)(i)
Question 6 (a)(1), (b)(i)(1)
Question 7 (a)(1), (b), (c)(1)
Question 8 (a)(iii), (b)

Unit 3

Questions 9 (a)(i)(1), (a)(ii), (b)(iii), (d)(iii), (e)(1)
Question 10 (a), (d)(i), (d)(ii)
Question 11 (b)

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 5 and 9 from Unit 1; Questions 13, 17 and 20 from Unit 2; and Questions 22 and 30 from Unit 3.

Section B

The following questions were answered well. Candidates clearly understood the questions and were able to make appropriate responses.

Question 1 (a)
Question 2 (c) (i)
Question 3 (a) (i)
Question 5 (a)
Question 6 (b) (i)
Question 7 (a)
Question 8 (a) (i) and (ii)
Question 9 (c) and (d)
Question 10 (c)
Question 11 (a)

Section C

Candidates favoured Question 1A on stem cells over Question 1B on evolution, and the average marks attained for 1A was significantly better that for 1B.

Candidates strongly favoured Question 2B on parasitism and mutualism over Question 2A on the capture of light energy, and the average marks for the 2B option was higher than that for 2A. Many candidates seemed to have prepared answers to Question 2B.

Areas which candidates found demanding

Section A

Candidates had more difficulty with Questions 1, 3, 8 and 10 from Unit 1; Questions 11, 16 and 19 from Unit 2; and Question 29 from Unit 3.

Section B

Question 1 (b) (ii): Very few candidates were able to give a complete answer, most simply saying that the enzyme unwound the double helix.

Question 1 (a) (iv): There was significant and unexpected difficulty with this question; many candidates simply referred to the carrying of genetic code but failed to distinguish this from the role of DNA by mentioning ‘nucleus’ or ‘ribosomes’.

Question 1 (b) (ii) Many candidates did not extract the information from the question stem and emphasise that human cells are eukaryotic.

Question 2 (c): Candidates had difficulty with the use of the term ‘role’ and could not relate different primers to the differences between two complementary DNA strands.

Question 3 (c) (iii): Many candidates used overt references to ‘God’ in responses rather than focus on the human debates involved.

Question 4: This question was poorly done compared to the only very slightly different version which appeared in the unrevised examination. Candidates had difficulty with the identification of the dependent variable — a new skill, not required in the unrevised context.

Question 5 (b): Many candidates thought that giving the carbon number of molecules would be sufficient to identify the compound from which they came. The Revised Arrangements specifically state that carbon counting is not required.

Question 5 (d) (i): Candidates did not know that the high energy electrons, shown in the diagram, provide energy to pump hydrogen ions across the inner mitochondrial membrane.

Question 7 (c): Candidates did not relate the efficiency of complete, double circulation with the capacity for high metabolic rates.

Question 10 (a): Few candidates were able to use the information about natural self-pollinators to attempt a response to this item.

Question 10 (d) (ii): Most candidates failed to appreciate the significance of the production of unpredictable varieties to breeders of crops such as maize.

Question 11 (c): Few candidates were able to relate the length of the parental care period to the development of complex social behaviours.

Question 12 (a): A definition of naturalised species, such as that outlined in the Arrangements, was not given by many candidates.

Section C

Question 1B: Candidates found the concepts of biological species and their individual populations to be demanding. Correct terminology is essential to show understanding. There was little evidence of candidates grasping the difficult concept of genetic drift.

Question 2A: Although candidates had some difficulty scoring marks in this question, they clearly realised the literal meaning of the phrase ‘light dependent’ although this is not overtly used in the Revised Arrangements.

Advice to centres for preparation of future candidates

General

As always, it is good practice to ensure that candidates attempting Higher Biology have appropriate prior attainment.

It is essential to realise the very significant differences between the Revised and Unrevised Arrangements for Higher Biology. Although certain topics appear in both sets of Arrangements, the vocabulary, contexts and emphases are often different. The additional detail given in the descriptions of Problem Solving skills should be noted.

It is worth sharing the points made in this report with candidates. The 'Areas candidates found demanding' section could be especially helpful.

It is highly recommended that candidates are given the opportunity to work with any published marking instructions from previous years' exams and those from the specimen paper. This may help in the pitching of answers to questions involving, for example, variables in experiments and ethical issues in medical science as well as tackling questions involving detailed explanations.

Use of the vocabulary offered in the Arrangements documentation is crucial. For example, the use of the names of respiratory intermediates, the terms 'species' and 'population' when describing evolutionary change, and the vocabulary used to describe 'introduced' and 'naturalised' species.

Practical work continues to be very important in Biology and candidates should continue to be exposed to apparatus and experimental procedures appropriate to their studies. The classification of variables is crucial.

Choice of extended response questions is important. Study of marking instructions from past years is highly recommended.

Statistical information: update on Courses

Number of resulted entries in 2011	-

Number of resulted entries in 2012	33

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	9.1%	9.1%	3	85
B	12.1%	21.2%	4	70
C	30.3%	51.5%	10	56
D	9.1%	60.6%	3	49
No award	39.4%	100.0%	13	-

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.