



External Assessment Report 2010

Subject	Biology
Level	Higher

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

Candidates performed well in Higher Biology this year although, for many, the paper proved more challenging than last year. This is reflected in a slightly reduced pass rate in the examination as a whole and also in the proportion of candidates gaining A and upper A grades.

Compared with last year, an increase in numbers of candidates encountering difficulties with the question paper was noted by markers and examiners. This perhaps suggests an increase in entries from candidates for whom Intermediate 2 might have been a more appropriate level — this is possibly reflected in the overall slight increase in entries for Higher Biology this year.

Section A (Objective Test — 30 marks)

Candidates responded well to Section A and the average score was 19 from 30. This average is lower than has been seen in recent papers. Candidates, as in last years' paper, performed less well in questions from Unit *D031 Control and Regulation* compared with the other two Units. Knowledge and Understanding questions were again done better than Problem Solving, which proved challenging to candidates perhaps due to the high requirement for graph reading in this year's paper.

Section B (Short Answer — 80 marks)

Candidates performed well in Section B, although not as strongly as was recorded in 2009.

Knowledge and Understanding responses generally showed a good basic grasp of the biological ideas involved in photosynthesis, DNA replication, cellular defence, inheritance, osmoregulation, annual plant growth, mineral deficiencies in plants, and factors affecting population numbers. Difficulty was noted with the linking of the action of respiratory enzymes to active transport, the vocabulary required to describe the role of hydrogen in photosynthesis, the role of vitamin D in humans, and in articulating the reasons for the monitoring of wild populations.

Problem Solving responses showed some strengths and revealed some difficulties. Numerical calculations, the presentation of data, concluding and predicting were well done but many candidates failed to use values from the source graph to describe the trends in data. Candidates also had problems with the identification of variables and, in particular, with the description of a control and in describing its purpose.

Section C (Extended Response — 20 marks)

This year, the responses in Section C were poorer than in recent years.

In Question 1, the option of Question 1A (effects of IAA and GA on plant growth and development) was much less popular than Question 1B (temperature regulation). In Question 1A, candidate responses related to GA and germination, and were generally stronger than answers related to the effects of IAA. In Question 1B, weaknesses were

shown in explanations which required the understanding of the roles of radiation, evaporation and insulation in heat loss.

In Question 2, the option of Question 2A (evolution of new species) was very much more popular than Question 2B (transpiration), although Question 2B was significantly higher-scoring, possibly due to the descriptive nature of the responses required. In Question 2A, many candidates had difficulty in describing the roles of mutation and natural selection in speciation and significant confusion was noted in many answers

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 A grade. In Section A, Questions 3, 5, 6, 14, 18, 21, 23, 24 and 28 were set with this broad intention. In Section B, Questions 1 (b)(ii) and (iii), 2 (b), 2 (c)(ii) and (iv), 3 (b)(i) and (ii), 4 (b), 5 (b)(iv), 6 (a)(iii) and (iv), 10 (a)(ii), 10 (d), 11 (a)(iv), 12 (a) and (b), 14 (a)(i) are examples of questions in this category.

In Section C, as always, certain extended response marks, often those with two part explanations, are designed to be more demanding than others.

Areas in which candidates performed well

Candidate performed well in the following questions:

Unit D029

- ◆ Questions A3 and B1 (a) — Cell structure in relation to function.
- ◆ Questions A4, B2 (a) and (c)(iii) — photosynthesis.
- ◆ Questions A5, A7 and B3 (a)(i) — energy release.
- ◆ Questions A8, A9, B4 (a)(i)(ii) and (iv) — synthesis and release of proteins.
- ◆ Question B5 — cellular response in defence.

Unit D030

- ◆ Questions A12, B7 (b) and (c), and B8 (a) — variation.
- ◆ Question A16 — selection and speciation.
- ◆ Questions A19, A20, B6 (b) and (c), and B9 (b) — adaptation.

Unit D031

- ◆ Questions A22, B10 (e) and B11 — control of growth.
- ◆ Questions A25, A26 and A29 — physiological homeostasis.
- ◆ Questions A30 and B14 (a)(ii) — population dynamics.

Areas which candidates found demanding

Candidates found the following questions particularly demanding.

Unit D029

- ◆ Questions A2, B1 (b)(ii) and (iii) — cell structure in relation to function.
- ◆ Questions B2 (b) and (c)(ii) — photosynthesis.
- ◆ Question B3 (b)(i) — energy release.
- ◆ Question B4 (b) — synthesis and release of proteins.
- ◆ Question B5 (b)(iv) — cellular response in defence.

Unit D030

- ◆ Questions A14 and B7 (a) — variation.
- ◆ Question C2A — selection and speciation.
- ◆ Questions A18, B6 (a)(i), (iii) and (iv), and C2B — adaptation.

Unit D031

- ◆ Questions A23, B8 (b), B10 (a)(i) and (c), B12 and C1A (i) — control of growth.
- ◆ Question C1B — physiological homeostasis.
- ◆ Questions A28, B14 (b) — population dynamics.

Advice to centres for preparation of future candidates

In general, candidates for the 2010 examination were well prepared although there was some evidence of over presentation.

In Knowledge and Understanding, more subtle concepts continue to require emphasis. In this paper, these would include the relationship between enzymes, respiration and energy-requiring processes (Question B1 (b)(iii)), the roles of mutation and natural selection in the evolution of new species (Question C2A), and the reasons for the monitoring of wild populations and the regulation of temperature in mammals where roles of physical process such as radiation, evaporation and insulation require emphasis (Question C1B). Language and vocabulary continue to be important. A good example of this being the need to use the term 'reduction' when describing the role of hydrogen in carbon fixation (Question B2 (c)(ii)). Candidates should be encouraged to use Arrangements language, for example, the description of the role of vitamin D in humans (Question B8 (b)) which allows more direct access to marks.

In Problem Solving, the scaling and labelling of graph axes continue to require emphasis especially in the need for completely enclosed scales using zero points as appropriate (Question B10 (b)). In describing trends in data, candidates should be aware that the use of values from the graph is mandatory and that the use of bolds in the question is intended to emphasise this (Question B6 (a)(i)).

It is always worth stressing to candidates that information and evidence needed to answer Problem Solving questions can be given in written stem material (Question B1 and B10) as well as in other forms such as graph, charts and tables. Practice in the identification of variables is recommended (Question B10 (a)(i)), especially where these are of a purely

biological nature. The identification and purposes of control needs to be carefully exemplified at a level appropriate to Higher (Question 10 (a)(ii)).

In Extended Response questions, choice continues to be very important and candidates should allocate a little time to making an appropriate choice. Candidates should be aware that full explanations should be offered where possible since some of the marks allocated may require more than one point to be made.

Statistical information: update on Courses

Number of resulted entries in 2009	9104
Number of resulted entries in 2010	9291

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	20.0%	20.0%	1858	89
B	22.0%	42.0%	2041	73
C	27.1%	69.1%	2518	57
D	12.2%	81.3%	1134	49
No award	18.7%	100.0%	1740	—

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, therefore, SQA 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 Head of Service 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.