



External Assessment Report 2015

Subject(s)	Biotechnology
Level(s)	Higher

The statistics used in this report are prior to the outcome of any Post Results Services requests.

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 is the final year of the Higher Biotechnology Course. Not surprisingly therefore, the number of entries was lower than in the last two years. It should be noted that the cohort of candidates is very unusual with such small numbers of entries. Candidate performance was generally good, though slightly poorer than in previous years.

The average mark for Section A was slightly lower, and overall the percentage of A–C grades was also reduced. However, there were more A grades than in 2014. The exam team felt the paper worked well in differentiating A–C grade candidates.

Candidates were generally well prepared for this assessment. Knowledge and understanding is good and straightforward problem solving is handled well. As noted previously, the more complex data analysis questions, and in-depth testing of understanding set in unfamiliar contexts, perform well as A grade discriminators.

Areas in which candidates performed well

As expected, the questions requiring straightforward recall produced good responses from most candidates. The following questions were found to be generally answered well:

Question 1(a):	Bacterial structure
Question 3(e)	Mutations
Question 6(e)(i)	Dealing with spillages
Question 7(a):	Sterilisation
Question 11(a):	Production of protoplasts

Candidates also performed well in questions that involved interpreting a graph and most basic calculations.

In Section C, the question on cell structure produced clear and comprehensive answers from many candidates. Fewer candidates chose to answer the energy production question.

Areas which candidates found demanding

As in previous years, candidates find complex data analysis, experimental design, and questions which require a more in-depth understanding of the subject challenging; however this is as expected, as these types of questions are designed to function as A grade discriminators.

Few candidates answered the following questions well:

Question 1(e):	Experimental design
----------------	---------------------

- Question 4(b);(d) Infection and vaccination. The application of knowledge proved to be difficult for candidates
- Question 5(f): Plant cloning
- Question 6(e)(iii) Large scale spillages.
- Question 11(c);(d): Genetically modified plants. This was applying knowledge which proved challenging.
- Question 5(d)(i): This question involved analysing data from two sources which candidates found challenging. Candidates generally failed to use the information to produce a reasonable explanation.

Many candidates also struggled with some of the more straightforward calculations such as those in Question 6(a) and 7(c).

Advice to centres for preparation of future candidates

This is the final year of the Higher Biotechnology course. However, many of the issues for preparation of candidates can be applied to the new Science courses.

In general, candidates would benefit from practice with interpretation of data and questions requiring calculations and number analysis.

Further practice in applying knowledge in an unfamiliar context would also improve performance for many candidates.

It is also important for candidates to be able to integrate knowledge from different areas of a particular Course, rather than seeing each Unit in isolation.

Statistical information: update on Courses

Number of resulted entries in 2014	24
------------------------------------	----

Number of resulted entries in 2015	17
------------------------------------	----

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	29.4%	29.4%	5	91
B	17.6%	47.1%	3	78
C	23.5%	70.6%	4	65
D	11.8%	82.4%	2	58
No award	17.6%	-	3	-

For this Course, the intention was to set an assessment with grade boundaries at the notional values of 50% for a Grade C and 70% for a Grade A. The Course assessment functioned as intended, therefore no adjustment to grade boundaries was required.

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.