



## External Assessment Report 2014

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

The number of presentations increased slightly from the previous two years. Candidate performance was good, with a similar percentage of candidates achieving Grade A–C as in previous years. The number of A grades was, however, down on previous years. The average mark for Section A was similar to previous years; for Section B and Section C it was slightly lower.

Centres generally prepare candidates well for the external assessment, and the standard of response is good. There are still areas where improvements could be made, in particular with the more challenging experimental design type questions and those that ask candidates to apply knowledge in unfamiliar contexts. It should be remembered, however, that some questions are designed to be ‘A’ type and should provide candidates with an opportunity to demonstrate this level of knowledge and skills.

## Areas in which candidates performed well

Candidates generally performed well in the straightforward recall questions, and in areas of knowledge which overlap with Biology and Human Biology. In particular responses in the following areas were strong:

- ◆ Question 1(a) and (b): bacterial structure
- ◆ Question 2(b): immune response
- ◆ Question 4(a)(i) and (iii): using a key for identification
- ◆ Question 6(d): applications of monoclonal antibodies
- ◆ Question 7(d): immobilisation of enzymes

In general the questions involving processing of data were handled well by most candidates.

The calculations in Question 7(c)(i) and 8(c)(ii) were successfully completed by most candidates.

Section C: The structured extended response questions were generally well answered, indicating that candidates have learned the subject and can respond well when guidance is given.

## Areas which candidates found demanding

As has been the case in the past, the experimental design questions were often not well answered. This seemed to be even more noticeable this year.

Candidates also struggled to explain trends and conclusions clearly, and answers were often confused.

The following questions proved demanding:

- ◆ Question 3(c) and (d)(ii): Both of these involved interpreting data from a table, and most candidates did not fully explain their answers.
- ◆ Question 4(b): Describing how to test for presence of spores. That this was so poorly answered is surprising as it involves application of a straightforward piece of knowledge.
- ◆ Question 6(b): Making a prediction. Most candidates failed to use the information given in the stem, which was essential to answer this question correctly.
- ◆ Question 8(d): Candidates were generally unable to explain their prediction.
- ◆ Question 9(d): Explaining the purpose of a step in the process. This required candidates to integrate knowledge from different parts of the course, and most failed to do this.
- ◆ Section C: The unstructured extended response questions were not as well answered as the structure questions, indicating that candidates are less well prepared when required to structure this information themselves.

## **Advice to centres for preparation of future candidates**

In general, candidates' knowledge is good, and centres are preparing candidates well for this assessment.

The knowledge and understanding of basic concepts of microbiology and cell biology is particularly evident. Candidates are also strong in areas of biotechnology applications such as enzyme immobilisation and monoclonal antibodies.

Some problem solving skills seem to be improving — for example, calculations involving percentages and ratios.

However, there are still areas that candidates are not performing well in. These include explaining experimental design, making clear predictions and giving reasons for these, and explaining conclusions.

Candidates often find questions requiring integration of knowledge from different parts of the course difficult, and this is something they should be aware of.

## Statistical information: update on Courses

Number of resulted entries in 2013	21
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Number of resulted entries in 2014	24
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## Statistical information: Performance of candidates

### Distribution of Course awards including grade boundaries

Distribution of Course awards	%	Cum. %	Number of candidates	Lowest mark
Maximum Mark 200				
A	25.0%	25.0%	6	90
B	25.0%	50.0%	6	77
C	37.5%	87.5%	9	64
D	8.3%	95.8%	2	57
No award	4.2%	-	1	-

## 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.