



External Assessment Report 2013

Subject(s)	Biotechnology
Level(s)	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

The number of exam entries was up very slightly on last year; however still lower than in previous years. Candidate performance overall was very good, although slightly fewer A grades were obtained this year. The grade distribution was similar to previous years and the quality of answers from most candidates was high. Centres appear to be preparing candidates well for the exam and this is reflected in the results.

Areas in which candidates performed well

Overall, many of the questions testing basic understanding of microbiology were answered well.

Question 1(b)(i),(ii) and (iii) on bacterial structure, and Question 3 (c)(i) and (d) on reproduction and used of yeast, were answered correctly by most candidates, which demonstrated that candidates had a good understanding of these basic concepts.

It was interesting to note that Question 2(a) and (b)(i) on the lac operon, an area often found demanding by candidates in the past, was well answered this year.

Candidate performance was better than in previous years in some of the data analysis questions, such as Question 6(b)(ii),(iii) and (d)(ii).

In Section C Question 1 (A) and (B) were answered very well by most candidates; however candidates found Question 2 (A) and (B) more challenging.

Areas which candidates found demanding

In general, and as in previous years, the experimental design questions were not well answered.

Question 1(b)(iv) on source of error was poorly explained, and Question 5(c) on experimental design produced few marks overall. Question 6(d)(i) on drawing conclusions was also poorly understood.

Markers commented on the poor quality of answers to Question 7 (d)(iii) and Question 11 (b)(i), as many candidates did not give full or clear enough explanations.

Advice to centres for preparation of future candidates

General

Candidate knowledge in general is clearly very good, and understanding of basic concepts, particularly those which overlap with other science subjects, is strong; overall, this has resulted in very good performance in the external assessment.

Most candidates appear to be well prepared for the exam; however there are still key areas where weaknesses arise. This occurs generally in problem solving questions, and in questions which require deeper application of knowledge.

Candidates often struggle with the understanding of experimental design, and identifying errors and variables in experiments. This is an area where centres could benefit from supporting candidates further.

Calculations appear to be causing fewer problems than in the past; however there is still a need for development.

In terms of basic knowledge and understanding, Unit 3, *Biotechnology*, continues to be the most demanding for candidates.

Statistical information: update on Courses

Number of resulted entries in 2012	18
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Number of resulted entries in 2013	21
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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 130				
A	47.6%	47.6%	10	91
B	33.3%	81.0%	7	78
C	4.8%	85.7%	1	65
D	9.5%	95.2%	2	58
No award	4.8%	100.0%	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.