Course Report 2017

Subject	Computing Science
Level	Advanced Higher

The statistics used in this report have been compiled before the completion of any Post Results Services.

This report provides information on the performance of candidates which it is hoped will be useful to teachers, lecturers and assessors in their preparation of candidates for future assessment. 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 assessment documents and marking instructions.

Section 1: Comments on the assessment

Component 1: project

The changes to the marking scheme last year made the marking guidelines clearer.

The average project mark had increased from 2016, and there was statistical evidence that the number of candidates gaining extremely high marks in the project had increased greatly from last year. This was taken into account when setting grade boundaries.

Component 2: question paper

The question paper consists of one section totalling 60 marks, and was structured in the same way as the specimen question paper (SQP) and exemplar question paper (EQP). The question paper is composed of four questions of 15 marks each.

This year's question paper largely performed as expected. Feedback from the marking team suggested that the question paper was fair in terms of course coverage and overall level of demand. The majority of candidates understood what was required, and were able to complete the four questions in the allocated time.

Section 2: Comments on candidate performance

Areas in which candidates performed well

Component 1: project

The majority of candidates showed excellent programming skills in a wide range of projects. Many candidates showed an enthusiasm to learn new skills and programming languages.

Component 2: question paper

1(a)	Most candidates produced an accurate Gantt chart to represent the four tasks, indicating the correct sequencing, and concurrency where applicable.
2(b)	The majority of candidates demonstrated improved knowledge of the online form processing content of the course.
2(c)	Most candidates were able to write a valid SQL statement to perform the task described.
2(d)	The majority of candidates applied the quicksort algorithm accurately to the values in the RIGHT sub-array.

3(a)(i)	Most candidates demonstrated much improved knowledge of object-oriented terminology (class, sub-class and inheritance) and were able to accurately interpret the UML class diagram.
3(c)	The majority of candidates were able to provide an accurate description of component testing.
4(a)	Most candidates were able to explain the relevance of a user survey for the situation described.
4(b)	Candidate responses to this question were particularly pleasing. The majority of candidates made an attempt to design a suitable procedure. Solutions were very varied and many were not only creative, but were also original, demonstrating good problem-solving skills.

Areas which candidates found demanding

Component 1: project

Candidates were not good at keeping evidence of the early stages of the development or ensuring that it was part of their reflective commentary. Candidates should ensure that the reflective commentary is used to explain how these phases have been altered and why. It may be advantageous for candidates to separate their reflective commentary for each stage of the project.

It is important to stress to the candidates that the Record of Progress and reflective commentary must be continually updated as there are marks available at each stage of the project.

Component 2: question paper

Generally, candidate performance in any question that required a descriptive response or explanation was very poor. Responses tended to be generic, rote-learned facts which candidates did not relate to the question scenario. With some questions, it was clear that candidates did not read the instructions properly before launching into a quick, single-sentence response. Examples of this included:

1(b)	Although the vast majority of candidates were able to give a reason why an array of records would be more suitable than a 2D array, many did not relate their answer to the processing of the data presented.
1(c)(ii)	The majority of candidates' responses simply stated that a stack is a 'first in last out' structure. There was little attempt to explain how this is relevant when a recursive function is being executed.

1(d) The majority of candidate responses simply stated that a queue is a ‘first in first out’ structure and made no reference to the problems its use would cause in the situation described.

1(e) Candidate responses were vague and lacked sufficient detail.

3(d) Candidate responses were vague and many lacked any reference to data analytics.

4(d) Many candidate responses fell short of Advanced Higher level by simply rewording the question stem and stating that the program used ‘several threads at the same time’. Little attempt was made to explain what effect this would have on the user experience.

4(e) Although many candidates were able to state that copyright is a form of automatic protection, their responses did not expand the statement to include any additional details as part of the descriptive answer.

In addition to the weak descriptive responses above, some areas of the more technical course content caused problems for a significant number of candidates. Examples of this included:

1(c) The majority of candidates did not spot the use made of recursion (and the need for a base case) in parts (i) and (iii).

2(a) Candidate responses were very disappointing. Although the majority of candidates did spot the primary key, most suggested incorrect data types (for example, NUMBER rather than INT or INTEGER and STRING rather than VARCHAR, CHAR or TEXT). In addition, very few candidates were able to suggest appropriate constraints.

3(a)(ii) Very few candidates were able to write the required class definition.

3(b) Although the majority of candidates did attempt this question, many did not make any reference to either the array of objects or the getCurrentValue() method. In addition, many candidates ignored the requirement to use the insertion sort, preferring instead to use the bubble sort algorithm.

4(c) The majority of responses that received marks did indicate the correct use of file handling but traversed a 1D array rather than the linked list indicated in the question.

Section 3: Advice for the preparation of future candidates

Component 1: project

Candidates are using ‘Appendix1: instructions and guidance for candidates’ for the Advanced Higher Computing Science project effectively. Assessors should ensure that candidates keep early versions of their project that can be used as evidence of development and should form part of the reflective commentary. The reflective commentary should be used to explain how these phases have been altered and why. It may be advantageous for candidates to separate their reflective commentary for each stage of the project.

Assessors should ensure that the marking scheme is adhered to especially regarding the reflective commentary.

Assessors should ensure that they have candidate evidence for each item within each section of the marking scheme to support their marking decisions.

Component 2: question paper

It was clear that overall candidate performance in the area of HTML form processing has significantly improved this year. This reflects good support and preparation from teachers/lecturers.

Centres should ensure that candidates are equally familiar with all the technical content in the course. Recursion is the only computational construct introduced at Advanced Higher level, and all candidates should be familiar with how it is implemented and the need for base cases to avoid infinite repetition.

Similarly, centres should ensure that candidates are familiar with all the stated standard algorithms. In particular, all candidates should know how to implement and code the three different sort algorithms (bubble sort, insertion sort and selection sort using two lists) and the binary search algorithm.

Although candidates demonstrated better understanding of the structure and specialist vocabulary of object-oriented programming languages, they were less familiar with object-oriented code. Centres should ensure that candidates have experience of creating object-oriented solutions, including those that make use of standard algorithms. This type of classroom activity will help prepare candidates to tackle problem-solving questions that require object-oriented solutions.

All candidates should be familiar with each of the data structures in the course. Centres should ensure that candidates have experience of how stacks, queues and linked lists would be implemented in code, and how data stored in each of these structures would be processed by that code. This would better prepare candidates for problem-solving questions that require knowledge and experience of these data structures.

Candidates must pay more attention to the wording of each question to ensure that their explanations and descriptions fully answer the question that was asked. In many cases, descriptive responses were little more that statements of fact. Candidates must relate relevant technical facts to the question, giving reasons why the facts apply in the situation described.

Whilst it was pleasing to see that the conditions of assessment for coursework were adhered to in the majority of centres, there were a small number of examples where this may not have been the case. Following feedback from teachers, we have strengthened the conditions of assessment criteria for National 5 subjects and will do so for Higher and Advanced Higher. The criteria are published clearly on our website and in course materials and must be adhered to. SQA takes very seriously its obligation to ensure fairness and equity for all candidates in all qualifications through consistent application of assessment conditions and investigates all cases alerted to us where conditions may not have been met.

Grade Boundary and Statistical information

Statistical information: update on courses

Number of resulted entries in 2016	485

Number of resulted entries in 2017	641

Statistical information: Performance of candidates

Distribution of course awards including grade boundaries

Distribution of course awards	%	Cum. %	Number of candidates	Lowest mark
Maximum Mark -				
A	20.3%	20.3%	130	115
B	24.2%	4.5%	155	99
C	26.4%	70.8%	169	84
D	10.9%	81.7%	70	76
No award	18.3%	-	117	-

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.