Course Report 2017

Subject	Computing Science
Level	National 5

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: question paper

The National 5 question paper 2017 consists of two sections totalling 90 marks: section 1 is worth 20 marks and consists of short answer questions; section 2 is worth 70 marks and consists of structured, context-based questions. This component is 60% of the overall marks for the course assessment.

The purpose of the question paper is to assess breadth of knowledge from across the course, depth of understanding, and application of this knowledge and understanding to answer appropriately challenging questions. It requires depth of understanding and application of knowledge from both the units.

Analysis of the question paper results showed that all questions were answered correctly by at least a proportion of the candidates, and that there was a spread of performances across the range of available marks.

Overall the question paper was less demanding than intended for 'A' and 'upper A' candidates as some of the questions that were designed to contain 'A' type marks were of a lower demand than intended. This was taken into account when setting grade boundaries.

Component 2: assignment

The marks gained in the assignment were higher than would be expected compared with the performance in the question paper. The average mark in the assignment had increased compared to last year and the marks at the extreme high end had greatly increased. This was taken into account when setting grade boundaries.

Next year the assignment will be externally marked.

Section 2: Comments on candidate performance

Areas in which candidates performed well

Component 1: question paper

Markers observed that where questions presented a similar assessment of knowledge as in previous years, candidates were showing an improvement. It is also pleasing to report that there was also an improvement in candidate responses to coding questions.

Section 1

This section of the question paper seems to have been reasonably straightforward for most candidates.

Question 1:	The majority of candidates could describe the difference between internal and external hyperlinks.
2:	Most candidates were able to describe how real numbers are stored in terms of mantissa and exponent.
3:	The majority of candidates could identify the data type Boolean.
6:	The majority of candidates could identify a standard file format from a provided URL.
7:	The majority of candidates could describe what happens when a specific data value is passed through code. Markers commented that candidates are becoming more confident in this area.
8(a):	The majority of candidates could identify why a presence check was required. Candidates looked at the problem and applied understanding.
8(b):	The majority of candidates could identify the field type graphic/object to store a photograph in a database.
10:	The majority of candidates could apply the application of downloading video to transmission media.
11:	Most candidates were able to identify the feature of a web browser that protects the user from letting others see their history.
12:	The majority of candidates could read the code provided and apply test data to it. Many candidates provided their working as well as stating all possible outputs. When candidates show their working they should state the final answer at the end of the working to make it clear to the marker what their final answer is.
13:	Most candidates identified the graphical design notation provided in the question.

Section 2

This section of the question paper is structured, context-based questions:

14 (a):	Most candidates could identify the field type from the database provided.
14(b)(i):	The majority of candidates could identify the act required to store personal information.
15(a):	While candidates could identify that integer data types were whole numbers, few candidates linked this fact to the scenario of vehicles.
15(b)(i–iii):	Candidates are confident in the function of the arithmetic logic unit, but are still struggling with the application of the data and address bus. This question linked the systems topic with coding.
15(d):	The majority of candidates could carry out a binary to decimal conversion.

16(a): The majority of candidates could identify features of the user interface that aid navigation.

16(b): The majority of candidates can identify where JavaScript can be used on a website for interactivity.

16(d)(ii): The majority of candidates could identify the graphic size from part (i) and apply this with the colour depth in part (ii). Where candidates showed full working for this question they were obtaining some marks because they were demonstrating their understanding. The 'A' grade candidates managed to achieve full marks.

16(e): The majority of candidates could identify tests that could be carried out on the website.

17(b): The majority of candidates could apply testing to the scenario given in the question.

18(a)(i): The majority of candidates correctly identified the features of a phone that allow the app to run faster.

18(a)(ii): Most candidates applied the scenario to the use of cloud and local storage.

18(b): The majority of candidates could identify that the artwork was covered under copyright.

18(c): The majority of candidates could identify a file format for video.

18(d): The majority of candidates could identify a biometric security method.

18(e): The majority of candidates could identify the act for using a wireless network without permission.

19(b)(ii): The majority of candidates worked out that following a division a number with a decimal point would be resulted — hence a real number.

19(b)(iii): The majority of candidates provided a complete answer with the averageHours variable displayed to the nearest whole number — applying line 120. The other candidates provided the correct text but did not apply line 120 to the variable averageHours.

19(c)(ii): The majority of candidates were confident in identifying techniques used to improve the readability of code.

20(a): The majority of candidates can look at a webpage and identify poor consistency of the user interface.

20(c)(ii): The majority of candidates were confident in the browser feature zoom/magnify.

20(d): The majority of candidates were confident in drawing the navigation structure of a webpage.

20(e)(i): The majority of candidates could explain phishing.

20(e)(ii): The majority of candidates could identify features from a website that would point the user of the website into the fact that it is not genuine.

Component 2: assignment

The assignments were well attempted by the majority of candidates sampled.
The majority of candidates sampled, showed that they had good programming skills and were able to build suitable information systems to complete the assignments.

Areas which candidates found demanding

Component 1: question paper

Section 1

Questions 4, 5 and 9 were answered incorrectly by the majority of candidates.

4:	The majority of candidates were unable to identify how vector graphics are stored in a computer system.
5:	The majority of candidates did not identify a bitmapped file type with transparency.
9:	The majority of candidates were unable to identify the component enabling the processor and a hard disk drive to communicate.

Section 2

Extended response questions requiring justifications, descriptions or explanations were more demanding for candidates. There was often a lack of precision in candidates' responses, especially when using computing terminology.

14(b)(ii):	Markers identified that candidates did not read the question and tended to give a generic answer rather than referring to the 'collecting this information'. This question required candidates to apply their knowledge of the Data Protection Act to a scenario.
14(c):	This question required candidates to describe advantages of relational database over flat-file databases, and they had difficulty in doing so.
14(d)(i):	Although the majority of candidates knew why primary keys and foreign keys are used, they struggled to apply their answer to the scenario.
14(d)(ii):	Although this was intended to be a more challenging question testing the A grade criteria, candidates had difficulty in applying the error message to the types of database validation that can be applied to a field.
14(e):	Candidates are becoming confident in applying knowledge of sorting of databases on one field but are still struggling to find the second. Although this was intended to be a more challenging question, candidates are demonstrating that they can achieve partial marks. To achieve full marks, they need to apply a sort that is applied on two fields.

15(c)(i): Candidates had difficulty in completing the condition, applying it to the scenario using appropriate variable name and demonstrating an understanding of the problem.

15(c)(ii): This question required candidates to apply knowledge in a problem-solving scenario ‘applying computing science concepts and techniques to create solutions across a range of contexts’. It was designed as a challenging question.

15(e)(i–ii): A significant number of candidates did not demonstrate knowledge of compilers and interpreters.

16(c): Candidates either knew HTML or they did not

16(d)(i): Candidates either knew addressing or they did not.

17(a): Several candidates achieved half marks in this question as they could state the input validation standard algorithm but they could not apply it to the problem. Candidates can respond in pseudocode or a programming language to allow the constructs of input validation and their application to be assessed.

17(c)(i–ii): Few candidates could identify an Execution/run time error. Although they could not identify the type of error, they could explain why this error occurred by examining the scenario.

17(d)(i): Several candidates had an idea as to what a syntax error is but they did not explain sufficiently.

17(d)(ii): This question required application of knowledge of syntax errors and recall of coding development during the course.

18(f)(i): Candidates answered on solid state in terms of portability — both the phone and the laptop are portable — rather than considering the other advantages of solid state.

18(f)(ii): Candidates answered in terms of data removal instead of reading the question and looking at environmental impact.

19(a): Candidates were told they were using a 1D array in the question, they had to apply this in their answer and select an appropriate loop construct.

19(b): Candidates did not identify that concatenation was required.

19(b)(iv): Candidates were unsure which pre-defined function had been applied, despite being able to apply the function in 19(b)(iii). Several candidates stated the Random function.

19(c)(i): Candidates were unclear about the purpose of indentation and the readability of code. Candidates will have experienced indentation in language-use and when reading code in written format.

20(b): Candidates were not confident in their understanding of how sound can be effected by changing the sampling rate

20(c)(i): Candidates are unclear about the hardware required to access the Internet.

Component 2: assignment

Candidates found the analysis and reporting stage of the task difficult and often did not manage to give all the points asked for.

Many candidates found the design stage of the program difficult to complete successfully, even though they seem to be able to solve the task in code. Candidates should be encouraged to use the design technique that they find easiest to show the development of the solution to the problem.

Candidates found the design stage of the database difficult to exemplify. The design stage of the database cannot be a screenshot of the implementation

Section 3: Advice for the preparation of future candidates

Component 1: question paper

Each year, the question paper samples the content of each unit of the course in approximately equal proportions. This means that candidates should be familiar with all aspects of the course. Some markers indicated that some answers suggest that some candidates had not prepared for the assessment, or had only covered some of the course content in depth.

Markers observe that questions from the Software Design and Development unit are generally well answered in terms of the basic knowledge, but that this knowledge is often not then applied to the context of the question. For example, candidates know the standard algorithm for input validation, but they cannot apply it to the given problem and are not able to access all the available marks.

It was also noted by markers that candidates did not always read the question and gave a generic answer rather than relating their answer to the given scenario and therefore could not access full marks for these items. Candidates should understand that they should apply their knowledge to the context of the question and develop this skill.

Candidates are confident in calculation and web-based questions on the human-computer interface, but they are not able to answer the computing parts of the web questions where they need to explain how the pages are linked and coded. This demonstrates a superficial understanding of Information System Design and Development. This is also evident in questions involving media types — candidates know the media types names but cannot explain why they are used in certain scenarios.

Candidates should be aware that ‘explain’ and ‘describe’ questions require more than a one-word answer (such as ‘faster’) and this does not demonstrate any real understanding or the higher-order thinking skills that the question is designed to elicit.

Centres should ensure that candidates are familiar with all the content of the course. Previous course reports are available to candidates on the SQA website and they should be encouraged to read these.

Component 2: assignment

In session 2017–18 the assignment component will change from an internally-assessed bank of tasks to a single annually-issued task, which will be externally assessed.

A specimen assignment task has been published on the National 5 Computing Science web pages and can be used to help centres prepare candidates for the assignment.

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	7927

Number of resulted entries in 2017	7442

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	29.4%	29.4%	2186	112
B	27.9%	57.3%	2076	95
C	24.8%	82.1%	1846	78
D	7.8%	89.9%	584	69
No award	10.1%	-	750	-

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.