



## External Assessment Report 2011

Subject	<b>Computing</b>
Level	<b>Higher</b>

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

As in previous years, the 2011 Higher Computing paper was generally well received by candidates, centres and the press. The paper was generally held to be a fair test of candidates' ability and was felt to be accessible to those who had adequately prepared. The number of candidates was similar to last year.

The average mark gained by candidates in the actual examination showed a further increase of three marks on 2010 levels, to 63.3 marks out of a possible 140. The average for the Coursework has shown a small rise, of half a mark, to 45.0 out of 60 marks.

There has been a slight drop in the pass rate, to 70.1%, and an increase in the number of 'no awards' to 19%.

Markers continue to report issues with the poor standard of written English in a significant number of candidates. Many candidates are still not reading all of the questions properly and/or not answering in the context of the scenarios given in the questions, thus leading to a loss of marks. The standard of too many responses was well below that expected in Higher Computing, with candidates continuing to give vague and/or simplistic responses that lack the sort of technical detail required at Higher level. Answers to 'explain' and/or 'describe' questions should explicitly refer to the scenario, where present, and should make a clear point for each of the marks offered.

Initial analysis of marks indicates that candidates gained an average of 15.9 marks out of 30 in the short response questions of Section I. In Section II, consisting of more challenging context-based questions, the average was 25 out of 60. The averages in these sections in 2010 were 14.4 and 28.6 respectively. The early analysis again shows an improvement in the performance of lower ability candidates, with 9.3% gaining fewer than 70 marks out of 200 for the examination and Coursework combined.

The total of the averages for each question in the optional topics was calculated as 24.9 for Artificial Intelligence, 25.4 for Computer Networking and 22.2 for Multimedia Technology. The totals for questions on each of the two Core topics were 23.5 and 17.4 out of 45 for Computer Systems and Software Development respectively.

The approximate ratios of candidates attempting each of the three Units in 2011 were three Artificial Intelligence to two Computer Networking to three Multimedia Technology.

Centre estimates again moved closer to actual performance in the final exam. It remains a concern that centres are presenting candidates whose estimate does not indicate any real chance of success in this exam, with 18.5% of candidate estimates being 'no award'.

## Areas in which candidates performed well

Candidates scored an average of 75% or better in the following questions.

### Section I

Question 2 (average 1.6 out of 2) was done well, with most candidates going for limited, but acceptable, descriptions of MIPS and FLOPS.

Question 6 (b)(ii) (average 0.9 out of 1) was very well done. The majority of candidates demonstrated a firm understanding of the relationship between bit-depth and file size.

Question 7 (a) (average 0.8 out of 1) was well done. The majority of candidates are able to identify the software specification.

Question 9 (average 0.9 out of 1) was very well done. Candidates losing this mark offered 'male/female', or similar, rather than 'true/false' within a vague response.

Question 10 (b) (average 0.9 out of 1) was very well done. Candidates generally opted for a variant of 'effective use of whitespace'.

Question 11 (a) (average 0.8 out of 1) was well done. However, many candidates elected to use a symbol, such as the ampersand, rather than state the term 'concatenation'.

Question 12 (a) (average 0.8 out of 1) was well done. The majority of candidates are able to identify scripting as the appropriate language type.

### Section II

Question 13 (e) (average 0.8 out of 1) showed the majority of candidates are able to name a virus detection technique.

Question 14 (b)(i) (average 1.8 out of 2) was done very well by most candidates. Some answers missed out the labels or did not show a ring topology.

### Section III

#### Part A

Question 19 (a)(ii) (average 0.8 out of 1) was done well, with well prepared candidates coping with the slightly different style of search tree question.

Question 20 (a) (average 2.3 out of 3) was well answered, with the majority of candidates producing a clearly labelled semantic net. However, many candidates included unnecessary information. This was ignored where it did not detract from the response.

#### Part B

Question 21 (b) (average 0.9 out of 1) was done very well. The vast majority of candidates identified the project manager.

Question 23 (a)(i) (average 0.8 out of 1) showed most candidates are able to identify a DOS attack.

Question 23 (a)(ii) (average 1.6 out of 2) demonstrated that candidates could identify the financial consequences of such an attack.

Question 24 (c) (average 1.6 out of 2) was done well by candidates, although responses tended to be a bit terse.

Question 24 (d)(ii) (average 0.8 out of 1) was done well by candidates able to offer answers related to the scenario.

### **Part C**

Question 26 (d) (average 0.9 out of 1) showed that candidates are able to name a MIDI attribute.

Question 27 (a)(ii) (average 0.9 out of 1) showed that candidates are able to name a transition.

Question 27 (b) (average 2.4 out of 3) demonstrated that calculations of video file size are secure for most candidates.

Question 28 (a) (average 2.3 out of 3) showed that the same is true of calculations of audio file size.

## **Areas which candidates found demanding**

Candidates scored an average of 30% or less in the following questions.

### **Section I**

Question 7 (b) (average 0.3 out of 1) was poorly done by the majority of candidates. Most incorrect responses did not refer to iteration wholly within the analysis stage, but opted for a generic answer.

Question 11 (b) (average 0.3 out of 1) found that, despite in most cases being able to identify the string operation concatenation in Part A, candidates proceeded to incorrectly identify the data type used as some sort of integer/number.

Question 12 (b) (average 0.6 out of 2) found many candidates unable to state a second benefit of a macro, with some merely repeating items from the stem.

### **Section II**

Question 13 (a) (average 0.6 out of 2) was not done well by most candidates, as they gave vague and/or incorrect answers regarding the use of cache/memory.

Question 13(b)(ii)i (average 0.2 out of 1) tested a deeper understanding of the relationship between memory capacity and address bus width. Candidates generally went for a simpler interpretation.

Question 14 (a)(ii) (average 0.6 out of 2) elicited vague and factually incorrect descriptions of peer-to-peer networks.

Question 15 (a) (average 0.6 out of 2) was not done well by most candidates, as they gave generic answers relating to users rather than focusing on why an event-driven language is best here.

Question 15 (b)(ii) (average 0.2 out of 1) was poorly answered by most candidates, who were unable to justify their earlier response.

Question 15 (d) (average 0.4 out of 2) betrayed a basic lack of understanding of the term 'systematic'.

Question 15 (f) (average 0.4 out of 2) was answered poorly, as many candidates have little understanding of the use of a compiler. Compilers **do not** 'translate code in a single step'.

Question 16 (a)(ii) (average 0.3 out of 2) was not done well, as most candidates have little concept of how to write efficient code. Some responses wrongly identified memory-efficient techniques.

Question 16 (b)(ii) (average 0.3 out of 1) revealed little understanding of out parameters.

Question 16 (d) (average 0.1 out of 1) was answered very poorly by the majority of candidates; many simply repeated the stem.

Question 16 (e)(ii) (average 0.6 out of 2) yielded generic responses about arrays, rather than addressing the question.

### **Section III**

#### **Part A**

Question 18 (a)(ii) (average 0.3 out of 1) showed candidates were unable to state the use of working memory.

Question 18 (b)(i) (average 0.6 out of 2) elicited simplistic responses that did not address the question.

Question 18 (b)(ii) (average 0.6 out of 2) showed an inability to relate responses to the scenario.

Question 18 (c) (average 0.1 out of 2) yielded general answers about flaws/issues of internet use, such as 'server crashes', rather than addressing the scenario.

Question 19 (b) (average 0.5 out of 2) had many candidates stating that breadth first found the best solution, instead of that the **first** solution found would be the best/shortest path in the tree.

## **Part B**

Question 21 (d) (average 0.5 out of 2) was not done well, as many candidates were unable to state simple facts about WML.

Question 22 (b) (average 0.3 out of 1) showed that, while many candidates are able to name stages of the OSI model, they cannot state a reason for its existence.

Question 23 (a)(iii) (average 0.6 out of 2) showed that most candidates do not know **how** a firewall operates.

Question 23 (c)(ii) (average 0.2 out of 1) was not done well; most candidates just guessed that the second octet was out of range (or similar). They failed to notice that it was different from the number in the other addresses.

Question 24 (e)(i) (average 0.5 out of 2) yielded simplistic responses, such as 'has access to the internet'.

## **Part C**

Question 26 (a)(ii) (average 0.5 out of 2) was poorly done by the vast majority of candidates, who tended to offer vague responses which did not show an advantage of streaming.

Question 26 (b) (average 0.6 out of 2) revealed a superficial understanding of the function of a codec.

Question 26 (c) (average 0.3 out of 2) revealed a continued lack of understanding of hardware codecs.

Question 26 (f)(ii) (average 0.3 out of 2) was not done well, with the majority giving shallow responses not addressing the scenario.

Question 27 (d) (average 0.3 out of 2) elicited shallow responses.

Question 28 (b) (average 0.2 out of 1) was a straight test of knowledge of PCM.

Question 28 (c)(ii) (average 0.5 out of 2) was poorly done, with candidates failing to show a benefit of container files.

Question 28 (d)(iii) (average 0.1 out of 1) found many candidates answering in terms of volume of recording or 'too close to mic'. These are excluded by the stem.

Question 28 (e)(ii) (average 0.3 out of 2) revealed that candidates have little more than a basic understanding of the features of holographic storage.

## Advice to centres for preparation of future candidates

The **context** of a question is important. If a candidate does not link their answer to the scenario, it will mean that the full mark allocation will not be available to candidates.

Candidates must ensure that they read the **whole** question; too many candidates lost marks through careless misreading.

Level of response required at Higher is greater than that required of Credit or Intermediate 2 candidates. Candidates should not offer answers like 'it is easier/quicker/cheaper' without some corresponding justification of why they are easier/quicker/cheaper.

In topics where Core and Options overlap, the Options have more detail and candidates are therefore expected to go further within their responses.

Candidates should work steadily throughout the year, making notes and learning the material properly. Candidates who cram at the last minute seldom recall with the level of detail required during the exam itself. The simple recall of facts may not help candidates when they are asked to relate parts of the Course or answer in context.

Attempt every question in the first two sections and all the questions in the optional topic studied. A blank response can gain no marks!

Read the marking instructions and reports for previous years. These documents contain invaluable advice for candidates and centres on a range of questions.

Use the experience of Markers and Examiners in your centre and local education authority.

Extract the content statements from the Arrangements documents and use colours to 'traffic light' them to highlight areas of difficulty and track learning.

Candidates should gain plenty of practice in exam technique throughout the year. It is vital that they also experience a practice assessment, or prelim, as close in structure to the real thing as possible. A well structured prelim, marked to the same standard as the SQA examination, will give important formative and summative feedback to candidates and centres alike. The paper should give the same time allocation per mark. It should also have the correct balance of Core to Option and straight recall to problem solving.

Encourage candidates to ask questions that go beyond the Course or link disparate areas of the Course. This can yield insights for both candidate and teacher.

Use SQA resources (like the [Understanding Standards](#) website, marking instructions and external assessment reports) with candidates — get them to think like Markers/Examiners. This will foster understanding, rather than focus on retention of facts.

## Statistical information: update on Courses

Number of resulted entries in 2010	4,356
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Number of resulted entries in 2011	4,124
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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	21.4%	21.4%	883	132
B	25.2%	46.6%	1039	112
C	23.3%	69.9%	959	93
D	10.6%	80.4%	436	83
No award	19.6%	100.0%	807	-

## **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, therefore, SQA 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 Head of Service 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.