



External Assessment Report 2013

Subject(s)	Computing
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 Higher Computing paper for 2013 was generally well received by centres and candidates. The general opinion was that the paper was fair and accessible. Some comments were made about the wording in some questions, and the Coursework task — these were taken into account during the grade boundary process.

There remain a significant number of candidates who do not read questions properly and/or tend to give rather simplistic responses. Many explanations and descriptions lack the technical detail required at Higher level. The contexts of many scenario-based questions were not considered, resulting in candidates being unable to access all the marks available.

The average marks gained in the written paper in each of the three options were Artificial Intelligence 66.48 (down from 69.82), Computer Networking 64.71 (down from 66.71) and Multimedia Technology 66.55 (up from 64.34). This difference is largely due to the performance in the Optional topic. Detailed analysis of the questions reveals no bias in the relative level of difficulty for these options. It was also noted that the proportion of candidates attempting the Computer Networking Unit continues to fall.

There is evidence that a number of candidates appear to be unprepared for the examination, with nearly one in eight gaining less than 75 marks out of 200 for the examination and Coursework combined. Markers continue to report the poor handwriting and standard of English in some scripts.

Candidate performance in the Coursework task is better where the average mark was 44.1 out of 60. Centres are advised to consider that some candidates gain significantly more in the Coursework than in the examination, which is out of 140.

Areas in which candidates performed well

Each question highlighted below averaged **75% or more** of the marks available.

- ◆ Question 6 (1.6 out of 2 marks): Shows that candidates can clearly recall control lines.
- ◆ Question 7 (1.8 out of 2 marks): Demonstrates that candidates can identify a given network topology.
- ◆ Question 20a) (1.6 out of 2 marks): Shows a good knowledge of techniques used during the analysis stage of the software design process.
- ◆ Question 21b) (1.5 out of 2 marks): Demonstrates understanding of suitable data types. Although many candidates cited 'text', rather than 'string', as a suitable alternative to Boolean here.
- ◆ Question 25a) (0.84 out of 1 mark): Shows that AI candidates can represent a goal state in a given notation.
- ◆ Question 26a) (1.63 out of 2 marks): Demonstrates that candidates can solve simple queries.

- ◆ Question 28a)ii) (0.78 out of 1 mark): Shows sound problem solving skills in identifying causes for misidentification of phonemes.
- ◆ Question 30a) (0.8 out of 1 mark): The majority of Networking candidates correctly identified a spider/crawler-based search engine from a description, however did not perform as well with the meta-search engine question.
- ◆ Question 30c) (0.83 out of 1 mark): Tested knowledge of social/financial benefit to consumers using a network to download software.
- ◆ Question 32d)i) (0.8 out of 1 mark): The majority of Multimedia candidates described the effect of increasing the duration of a note.

Areas which candidates found demanding

Each question highlighted below averaged **25% or less** of the marks available.

- ◆ Question 13 (0.5 out of 2 marks): Asked for two benefits of a scripting language. Candidate responses generally described features, rather than benefits.
- ◆ Question 20f) (0.4 out of 2 marks): Asked for a description of two 'items of evidence' to demonstrate efficiency of a program. Candidate responses tended to describe ways of making code efficient. Responses also lacked technical depth.
- ◆ Question 21c) (0.5 out of 2 marks): Asked why a declarative language 'might not be suitable in this case'. Candidate responses must link a fact about the scenario (ie MoodyZak uses a list of data on mood) to a fact about declarative languages (ie these use pattern matching to process lists).
- ◆ Question 22b) (0.5 out of 2 marks): Asked candidates to describe the relative efficiency of a compiler and an interpreter within the context of translating/executing a loop. Responses lacked technical depth or accuracy, referring to a compilers 'ability' to translate a block of code 'all at once'.
- ◆ Question 24a)ii) (0.14 out of 1 mark): Asked how a semantic net aided the implementation of a declarative program. Many did not read the question properly, and gave advantages of the diagram itself. Candidates can draw and explain semantic nets, but did not grasp their use in the design stage.
- ◆ Question 24b)ii) (0.6 out of 3 marks): Asked for a rule that would allow entities to 'inherit' a property. It appears that many did not understand the concept of inheritance. Many tried to respond with a generic inheritance rule, for which they gained marks.
- ◆ Question 27b)ii) (0.14 out of 1 mark): Asked about a benefit of a narrow domain. Most responses merely described what the term meant.
- ◆ Question 27c)ii) (0.28 out of 2 marks): Asked why maintenance of an expert system was difficult. Most answers did not relate to the question or were generic answers about maintenance or expert systems.
- ◆ Question 28a)i) (0.49 out of 2 marks): Asked candidates to describe the process of splitting speech into phonemes, matching these against stored patterns and identifying matches as words. Most responses were very poor.
- ◆ Question 29e) (0.24 out of 1 mark): Asked candidates to identify an error in WML code. Most responses were poor, and did not identify either of the two errors. There was little evidence that many had any practical experience of WML code.
- ◆ Question 30h) (0.2 out of 1 mark): Asked candidates to suggest a reason why a device might unexpectedly fail to connect to a WPAN network. Responses were poor here
- ◆ Question 31c)ii) (0.41 out of 2 marks): Part i) of this question asked candidates to name and describe one type of denial of service attack. Many of these answers were generic,

lacking any detail. Most responses to part ii) were very poor and lacked any technical detail. Some candidates did not note that the question stated that both firewall and anti-virus software were fully operational.

- ◆ Question 32c) (0.32 out of 2 marks): Showed that most candidates could not describe the purpose of a DSP. Some candidates offered responses lacking detail or one word answers.
- ◆ Question 33e)i) (0.22 out of 1 mark): Showed clearly that most candidates did not know the purpose of a Colour Look Up Table (CLUT) or could not express it adequately.
- ◆ Question 33e)ii) (0.12 out of 1 mark): Showed clearly that most candidates could not identify a benefit of a CLUT.
- ◆ Question 33f)ii) (0.35 out of 2 marks): Showed clearly that most candidates did not know how the LZW compression technique operates. Part i), concerning the RLE technique, was done better, but there is still a great deal of confusion between these techniques despite this being highlighted in past External Assessment Reports.
- ◆ Question 34e) (0.34 out of 2 marks): asked candidates to explain why stereo recording sound little different when played on a surround sound system instead. Candidates generally gave a benefit of the latter as a response rather than explain that, like playing a mono recording on a stereo system, channels cannot be added simply by playing it on 'better' hardware.
- ◆ Question 35b) (0.04 out of 1 mark): The lowest performing question of the paper showed a lack of understanding of the process, and necessity, of displaying a vector graphic on a bitmap monitor.

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 given scenario when asked to do so, they will be unable to access all the marks.
- ◆ Candidates must ensure that they read the **entire** question. Many candidates missed out marks through misreading, for example describing a security method named in the stem of a question rather than describing another as required (see question 30d).
- ◆ The level of detail in a response at Higher exceeds that required in Credit/Int 2. 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 go into more detail. Candidates are therefore expected to go further within their responses.
- ◆ Advise students to attempt **every** question in the first two sections and in the Optional topic studied.
- ◆ Advise students to work steadily throughout the year, making notes and learning the material properly. This will ensure that they will be giving themselves the best opportunity and grounding to sit the examination.
- ◆ Candidates should be able to name and describe each item/concept identified in the course descriptors. This list could be issued to candidates and be used for structuring regular revision (using 'traffic-lighting' for example).
- ◆ Some candidates have very poor handwriting, causing markers extreme difficulty in assessing what the response says. Where candidate handwriting is particularly poor, centres are advised to explore other options such as scribing, transcription or wordprocessing of responses.

- ◆ Read the marking instructions and External Assessment reports for previous years. These will give a clearer understanding of the level of response required. These documents contain invaluable advice for candidates and centres on a range of questions.
- ◆ Candidates should also be encouraged to read past papers, marking instructions and External Assessment Reports.
- ◆ 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 an SQA assessment. A well structured prelim, marked to the same standard as the SQA examination, will give important formative and summative feedback to candidates and centres.
- ◆ Practise the 'set pieces' for each of the Optional topics.
- ◆ Encourage candidates to set out calculations neatly and offer plenty of practice. Do not miss out steps, as they can gain marks even. Practising calculations, such as maximum size of addressable memory, is recommended.

Statistical information: update on Courses

Number of resulted entries in 2012	4025
Number of resulted entries in 2013	3990

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	23.8%	23.8%	949	133
B	23.4%	47.1%	932	113
C	23.4%	70.6%	935	94
D	9.7%	80.3%	388	84
No award	19.7%	100.0%	786	-

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.