



External Assessment Report 2014

Subject(s)	Computing
Level(s)	Higher

The statistics used in this report are prior to the outcome of any Post Results Services requests

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 2014 paper was regarded by most professionals as a fair paper. Most also felt that the paper was accessible to all, with most candidates feeling able to attempt a high proportion of the questions. Overall, the paper is close to the norm for National Rating.

At the time of the Awarding Meeting, 4439 candidates had data recorded. This represents an increase of 13.4% over entries in 2013. Summary statistics were available for 4388 (98.85%) of the entries.

Higher Computing has three optional topics. Computer Networking remains the least favoured optional topic. Artificial Intelligence candidates score slightly higher than candidates taking the other options, but statistically this is not significant. The Setting Team ensured consistency of standard of questions offered between each option.

Over the years, the Setting Team have put in considerable effort to make the paper accessible to all candidates. In the 2014 paper, it has been noted that most candidates made an attempt at most questions

Some summary data for these options, based on the 4388 candidates, is given below:

Optional topic	Number of candidates	2014 Average mark (140)	2013 Average mark (140)	2014 Average Coursework mark (60)	2013 Average Coursework mark (60)
Artificial Intelligence	1612 (36.7%)	65.6	66.5		
Computer Networking	1244 (28.4%)	62.3	64.7		
Multimedia Technology	1532 (34.9%)	62.4	66.6		
Total number of candidates	4388	63.7	66.0	47.5	44.1

The average mark for the external examination is the lowest of the last three years, but this drop is more than compensated for by the increase in the average mark for the Coursework. Candidates tend to score proportionately more highly in the Coursework than they do in the external examination.

It is still obvious that, for whatever reason, some candidates are being inappropriately entered for the external examination. 10% of candidates scored less than 75 marks out of 200; this is a slight improvement on the equivalent 12.5% reported last year, but the increase can be explained by the improvement in performance in the Coursework.

Areas in which candidates performed well

Core

Question 2: This is a commonly asked question and more candidates' answers are now technically correct. There were more answers relating to 'character representation' rather than 'store more alphabets' than in previous years.

Question 9: Candidates clearly know what the bootstrap loader does.

Question 15(a) and (b): Candidates know the basic definitions for criteria for evaluating software.

Question 20(a): Drawing a network topology should allow all candidates to achieve 2 out of 2 marks. An average mark of approximately 1.75 out of 2 does show that most candidates do get 2, but still some do not.

Question 21(c): Many candidates are now performing well in questions involving a calculation. The format of this question was a little different from the 'usual' question.

Question 22(g): Characteristics of well written code are now well known.

Question 23(b): Candidates are now recognising the need for the use of an array and most were good at identifying string as the appropriate data type.

Question 23(d)(i): The scope of a global variable proved to be straightforward for most candidates.

Artificial Intelligence

Question 26(d)(i) and (ii): It was encouraging to see that candidates understood the scenario and the notation being used to represent states.

Question 27(a): Traditionally a question to lead candidates into the knowledge base, this question was answered well. It was pleasing to see that candidates are now being careful with the use of capital letters as well as the inclusion of 'A=' in their answers.

Question 27(b): Being able to formulate a query is essential in knowledge based systems. Candidates showed a good understanding of the structure of the knowledge base and again the relevance of the use of capital letters.

Computer Networking

Question 29(e)(ii): The concept of a walled garden is now being described well.

Question 30(f)(i): Questions relating to social benefits associated with a computer system are, by nature, relatively simple and tend to draw the more straightforward, basic answers; this is what candidates were doing to get an average mark of 0.8 out of 1.

Multimedia Technology

Question 31(b): Candidates are able to identify the type of maintenance in a given scenario.

Question 31(e): A standard calculation question which was well answered with an average mark of 2.4 out of 3.

Question 32(c) and (d): Appropriate identification of file types was done well.

Areas which candidates found demanding

Core

Question 1: Many candidates failed to read this question carefully. Having done the numerical work correctly to get '50', a lot of candidates did not return a negative answer and so lost the mark. It was also noted by Markers that a substantial number of candidates failed to read 'two's complement' in the stem of the question and gave the answer 206.

Question 7: The common answer of 'data conversion' is ambiguous and candidates needed to specify 'data **format** conversion' as their answer.

Question 12: The concept of iteration should be well known to candidates. However, this question related to the production of the software specification and candidates did not answer within this scenario.

Question 13(a): Almost two out of five candidates failed to recognise pseudocode, many identifying it as a flowchart.

Question 19(c): The question specified 'hardware compatibility factors', but many responses related to software.

Question 19(d): This question related to the involvement of Memory Management during the process of saving a file. Candidates tended to give two functions of Memory Management that were not related to the context of saving to backing storage. Some candidates answered in terms of File Management. The average mark for this question was 0.1 out of 2.

Question 21(d)(i): Candidates need to be aware that for most exam questions involving MIPS and, in this case, FLOPS, it is unlikely that just expanding on the acronyms will gain the marks.

Question 23(c): Whilst this was a relatively straightforward algorithm question, the average mark for this question was approximately 2 out of 5. Candidates appeared to find that the inclusion of a complex condition was problematic. It should be noted that candidates need to be clear about the domain and termination of the loop. They should also clearly show the end of a conditional statement.

Artificial Intelligence

Question 25(a) to (c): The ANS question caused many candidates to gain poor marks. Candidates need to learn more detail about the structure and training of an ANS.

Computer Networking

Question 26(c)(i) and (ii): The average mark of 0.75 out of 4 clearly indicates that candidates need to know more about asynchronous data transmission; some mentioned start and stop bits, but answers went little beyond that.

Question 28(e): Some answers were very muddled with overlapping tags and wrong identification of tag content.

Question 30(c)(iii): Only about 1 in 7 candidates were able to identify the correct layer of the OSI model.

Multimedia Technology

Question 32(f)(i): Candidates did not respond to the scenario of the question ie 'storing a font'.

Question 34(f): Candidates did not demonstrate an understanding of the concept of a container file.

Question 34(g)(ii): Two of the commonly identified functions of a DSP were stated in the stem of the question. Candidates needed to describe two others.

Question 34(h)(i): The question stated that candidates needed to include an appropriate level of technical detail. Vague answers were all too common.

Advice to centres for preparation of future candidates

Candidates must be trained to take the time to read questions carefully. Many Markers commented that candidates did not seem to be reading the questions carefully enough; they were missing details of the scenario and giving answers that had been excluded in the stem of the question. Candidates should practice answering questions using the given scenario rather than generic answers. It is important that candidates are able to apply their knowledge in context.

At the level of Higher Computing, it is expected that candidates will use an appropriate level of terminology in their response to questions. Terms such as 'space', 'storage' and 'processor power' occur frequently and need to be tightened up into terms such as 'backing storage', 'clock speed' or 'multi-core'. Candidates frequently confuse backing storage and memory. It is also important to keep stressing to candidates that answers involving terms such as faster/easier/cheaper/efficient and so on, need to be explained.

An important part of exam technique is to take the mark allocation of a question into account when structuring a response. Candidates need to be given guidance on how to answer two-mark questions that ask for an explanation or a description. Many candidates will get one

mark, but few get two. A Marker needs to have two 'places to put a tick' eg a statement and a consequence.

Candidates should devote time to learning basic definitions and facts. Some, such as features of good program code, are well known but others less so. Such knowledge is essential as the base for answering problem solving questions.

It is worth taking time to introduce candidates to the Arrangements document and the list of contents on which the external assessment will be based; it is a useful revision tool. Candidates will also find it useful to be guided through the Internal and External Assessment reports. A careful study of past paper questions will reveal content which is regularly assessed; year on year candidates seem unprepared for such questions.

This year, several Markers commented on the poor standard of handwriting of some candidates. Candidates should be reminded that if Markers and Examiners cannot read what they have written, the marks will not be awarded. Centres are advised to identify cases of poor handwriting and to investigate the criteria for use of a word processor where appropriate. Also, there were several issues where candidates had failed to label, or mislabelled, their answers. Please advise candidates to make it clear which question their answer relates to.

Encourage candidates to prepare carefully for the exam. Nothing will be asked that is not in the Arrangements, and the exam is the forum for a candidate to demonstrate and apply their knowledge.

Statistical information: update on Courses

Number of resulted entries in 2013	3990
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Number of resulted entries in 2014	4468
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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	24.1%	24.1%	1079	133
B	23.4%	47.6%	1046	114
C	22.9%	70.5%	1024	96
D	9.4%	79.9%	419	87
No award	20.1%	-	900	-

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.