OCR
Oxford Cambridge and RSA

GCE

Computing

Advanced GCE **A2 H447**

Advanced Subsidiary GCE **AS H047**

OCR Report to Centres June 2016

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This report on the examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the specification content, of the operation of the scheme of assessment and of the application of assessment criteria.

Reports should be read in conjunction with the published question papers and mark schemes for the examination.

OCR will not enter into any discussion or correspondence in connection with this report.

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OCR REPORT TO CENTRES

F451 Computer Fundamentals

General Comments:

In general, candidate responses demonstrated subject knowledge appropriate to the specification. There were very few candidates who were evidently not fully prepared for the rigour of the examination.

The presentation of work was generally very good. Candidates' handwriting on some scripts was difficult to read. Candidates should be aware that they may not gain credit for creditworthy responses if their handwriting is illegible. There was no evidence to suggest that candidates experienced any issues with the duration of the examination.

Comments on Individual Questions:

Question No.
1a)
1bi)
1bii)
These questions were well answered, with most candidates achieving full marks.

1c)
Most candidates could identify and justify an appropriate storage medium although some candidates cited 'cloud' storage which was inappropriate in the context. Candidates should be reminded to read the question thoroughly.

1d)
Most candidates could explain some reasons why batch processing would be suitable in the given scenario.

1e)
This question was well answered with most candidates correctly identifying that 'off the shelf' software is already available.

2a)
Most candidates could identify 'double entry' but many did not explain that the computer carries out the comparison.

2bi)
Many candidates' explanations lacked clarity. Although most did state that Unicode was a character set.

2bii)
Few candidates referred to the codes that represent the symbols in their explanations, more so referring to the symbols themselves which did not gain credit.

2c)
Many candidates did not address the question appropriately. Many responses related to designing questionnaires in general rather than designing questionnaires for OMR input. Candidates should be reminded to read the question thoroughly.

3ai)
3aii)
These questions were generally well answered, although some candidates described a LAN as having few computers with a WAN having many.

3b)
Most candidates stated a valid creditworthy piece of hardware but their descriptions lacked clarity.

3c)
This was a QWC question where the responses are banded. Many candidates could reasonably describe the difference between menu-driven and natural language interfaces with some going on to justify their recommendations. A few candidates could only describe one type of interface.

4ai)
4aii)
4aiii)
4b)
These questions were well answered, with many candidates achieving full marks. However, some candidates lost marks for simple arithmetic errors. Candidates should be reminded to thoroughly check their responses.

5a)
This question was well answered with most candidates correctly explaining why the feasibility study is important and many candidates explaining some functions.

5b)
Most candidates could state three methods for gathering requirements but in some cases descriptions lacked clarity.

5ci)
Few candidates could define 'knowledge based system' appropriately, with many stating it was simply an 'expert system'.

5cii)
Again, few candidates could clearly describe a 'knowledge base' but many did go on to gain credit for describing how it could be applied in the scenario.

6a)
Some candidates answered this question well, however descriptions in some cases lacked attention to detail with some responses not going beyond '…the control unit tells all the parts of the processor what to do…' which is not creditworthy at this level.

6b)
Candidates were required in this question to relate their explanations to the scenario. Many candidates did this and therefore scored well on this question.

6ci)
This question was well answered, with most candidates achieving the mark.

6cii)
Many candidates answered this question well, correctly referring to the speed mismatch between the smartwatch and the mobile phone.

6di)
6dii)
These questions were well answered, with many candidates achieving full marks.

7a)
This question was answered better than exam questions on this topic in previous exam series. With many candidates referring to the pertinent points.

7b)
This question was well answered, with many candidates achieving full marks.

7c)
Although many candidates did score well on this question there is still clear evidence of confusion between back up and archiving of data. Centres are advised to clarify these misconceptions.

7di)
Most candidates appropriately described a logical protocol with many citing an example as part of their description.

7dii)
Few candidates gained credit on this question as many did not clearly explain an advantage of layering the protocols independently.

8a)
This question was well answered with most candidates clearly describing some of the legal responsibilities of companies.

8b)
This was a QWC question where the responses are banded. To achieve high marks, candidates were required to discuss how computers have changed people's work patterns **and** relate these points to the impact it has on their well-being. Many candidates addressed the first part of the question but did not go on to relate these changes to the impact on the workers' well-being. This meant that those candidates did not achieve high marks on this question. Centres should encourage candidates to structure their response to clearly address all strands in the stem of the question.

F452 Programming Techniques and Logical Methods

General Comments:

Most of the candidates taking the paper were those resitting the paper. It was good to see another year where the candidates were willing to tackle most questions with only a limited amount of no responses. However, the use of standard technical terms and definitions still causes some candidates problems.

There were several general problem areas: The first was candidates' understanding of the difference between instructions, data and information. The second was the difference between serial, sequential, and index sequential files. The third was the relationship between fields, records and files, along with general file handling. Lastly the lack of detail in the algorithms, coupled with string handling problems, led to few candidates gaining the top marks in these questions.

Comments on Individual Questions:

Question No.

Q1(a) In general this was well answered with most candidates gaining 4 marks. Some candidates gave the highs and lows of each sensor, which made the screen very cramped and did not allow them to leave space for the data. A small minority of candidates didn't use the grid and just wrote across it.

(b)(i) It was disappointing to see that a lot of candidates are not aware of the correct data type to use and the byte sizes.

(b)(ii) This was mostly answered very well, with the main weakness being not allowing for overheads or showing how they converted to KB.

(c)(i) Most candidates were unsure of where the initialisation of values should take place within the design, although most candidates in the algorithm questions placed it correctly.

(c)(ii) On the whole this question was answered poorly. Most candidates gained the marks for opening and closing the file but few understood the concept of file access modes and their effect on data already in the file. Also a few candidates did not appreciate the difference between how to write to a file as opposed to the screen.

(d) Much confusion over the difference between a record and a file led to most candidates discussing fixed and variable length files, often opting for variable length because the length of the journey may change.

Q2(a)(i) Often well answered though describing the loop in the development process was poorly expressed. Also there was a lack of mention of feedback from the customer/client.

(a)(ii) The final mark point was the trickiest for the candidates to achieve as it was often poorly expressed/missed, with the candidates going on to list the benefits of stepwise refinement instead.

(b) Types of testing were well understood by most candidates, but they did not always express themselves clearly enough to gain marks for the description.

Q3(a)(i) Logic error was well known and the stronger candidates spotted the error in the code, but many candidates struggled looking for the error in the format of DateOfBirth.

(a)(ii) Comments and meaningful identifiers were both very well known. A small number of candidates, however, didn't go on to give an actual example.

(a)(iii) String handling was a problem in this question, although most candidates gained the concatenation mark. The use of LEFT, MID and RIGHT (or other language string function) was very limited. A large minority tried to use iteration to get individual characters from the strings. Also some were unsure of how to call the function (RandomDigit). Also there are still quite a few candidates that get the assignment statement the wrong way round e.g. username+LEFT(FirstName,3) = username

(a)(iv) This was a low scoring question. Most candidates wrote "return a single value" but nothing else. A large minority seemed to think the difference was recursion, but varied as to which one could do it. It was good to see that a few understood the concept that procedures pass back values and functions return a value. A small number of candidates did realise that a function can be used in an expression.

(b) This was largely well answered, though some of the code examples for iteration were for infinite loops.

(c)(i) Generally well answered.

(c)(ii) Most gained a mark, although many vague references to code were given which were rescued by definitions of global and local variables.

Q4(a) As with all algorithm questions this was poorly answered, with most candidates only achieving the open and close file marks. Most of the candidates did not know how to process a file and read records from the file. A typical answer was to treat the file as an array, for example to access a record they used "Favourites.dat[i]" or to iterate through the file "for i to Favourites.dat.length", so achieving no marks. The lack of detail in the algorithm was also a problem with statements such as "if Barcode not in file add to file".

(b) The main problem the candidates had with this question is that they described how to find the record in an index sequential file and not a sequential file. It is extremely difficult to describe the required search using prose but this is what nearly all responses tried to do. Many candidates referred to "check if it's the right record and if not repeat" without saying exactly what to repeat and without reading a record anyway. They may have found a numbered bullet point response easier.

Q5(a)(i) Candidates have in the past found trace table difficult to complete. However many candidates achieved full marks on this question, with most gaining at least one mark.

(a)(ii) Those that did poorly on the previous question rarely got a mark here.

(b) Few candidates achieved all the marks here but many did spot the need to check if value < 0 and convert the –ve to +ve or change the sign. They were some interesting ways of converting (not all correct) -ve to +ve e.g. value = value - (2*value).

F453 Advanced Computing Theory

General Comments:

The Principal Examiner has reporting seeing fewer Nil Responses on this paper which is promising. Most candidates tried to tackle every area of the paper and it was good to see that they had the confidence to respond to every question. There were very few candidates who were evidently not fully prepared for the rigour of the examination.

Comments on Individual Questions:

Question No.

1 a (i) Generally well answered but there were a small number of candidates who seem to have got mixed up with stack and queue operations.

1 a (ii) A number of candidates seemed to have taken an earlier answer to a similar question slightly out of context and implied that the processor made sure that it got as many users as possible. “Maximise the number of users” on its own was not considered enough for a mark.

1 b(i) This was answered as expected with most candidates getting 1 mark, a fair amount got 2.

1 b(ii) As would be expected of this question, it was the second part to the previous and the spread of marks was the same.

1 b(iii) Most candidates were quite unspecific in their responses to this part of the question, this was aimed at higher grade candidates and it did define the differences between an average response and a good one.

2 a) A mixed result on this, most candidates achieved 1 or 2 marks, very few got no marks at all, most got one or two.

2 b) Most candidates responded with “can be used on any machine”, a good percentage got the “virtual machine”, not many got “protects source code”.

2 c) Well answered although there was a tendency for some candidates to repeat the response to the question above worded slightly differently.

3 a) A lot of candidates are unsure as to what actually happens in the fetch decode execute cycle and some very vague answers were provided. However, there were a few excellent responses that did show a good understanding of the processes.

3 b) One or two candidates just wrote an acronym, this was not acceptable.

3 c) A fair number of responses were still mentioning cost as a difference: the Principal Examiner felt this response was not contextualised to computing and as such no credit was allowed for this.

4 a (i) Candidates are getting expert at these and there were very few wrong answers.

4 a (ii) The most common errors were either moving the exponent the wrong way or treating the whole number as a single entity. Very few candidates are doing this though.

4 b) Very few candidates got this wrong, most managed to achieve the full four marks.

5 a) Most candidates got one or two marks on this.

5 b (i) Almost all candidates got at least one mark for this, an appropriate amount managed the second mark as well.

5 b (ii) A few candidates still tried to write an algorithm for this, although they were good, they did not answer the question.

5 b (iii) This question generated a fairly bizarre assortment of answers. Those who knew what they were doing got it right, those who didn't or weren't sure responded in strange ways.

6 a) For some reason function came up fairly regularly as a response for method, it is unclear where the candidates are getting this from, otherwise this was answered well by most candidates.

7 a) Most candidates responded correctly to this, answers that were wrong generally mixed up either the middle two answers or the top and bottom.

7 b) With the example in front of them all candidates should have been able to follow the program and get at least three marks, however, a significant number of candidates could not follow the example given in order to write the next three lines.

8 a) Most candidates could do a decent representation of breaking down a problem and most got four marks with the description. A surprisingly large number of candidates managed a full response which was great to see. Some unfamiliar diagrams were presented for this by a few candidates.

8 b) As was expected for this question most got at least one mark, a fair proportion got two and a few managed all three.

8 c) A large majority of very good answers to this question with candidates writing confidently.

9 a) As was expected for the banded response question all candidates could write something about the registers and almost all of those could write something about a jump instruction. There were some good write-ups about the use of the accumulator and the ALU, some mentioned the use of buses, but Control Unit and Interrupt register were a rare find. Saving was a bit patchy with some rather vague descriptions although there were still the occasional gems to be found. A good spread of responses overall.

9 b) This was one of the questions that was partially aimed at higher ability candidates. Most candidates managed to achieve a mark or two here though which was good to see.

10 a) Mostly well answered

10 b) As was expected most candidates got the full three marks on this. The most common mistake was not using proper names; candidates seemed to feel the need to make everything plural.

10 c) This question was designed to test the candidate's knowledge of SQL and most candidates did not get this right; the Principal Examiner was expecting to be told about attributes and tables and ascending not alphabetical (this type of question has come up before) but most candidates seemed not to know what to expect.

10 d (i) Those candidates who had actually read the question got this right, some just guessed.

10 d (ii) A fair number of candidates managed to get a mark on this question. Those that failed to get a mark had not read the question and did not apply the given scenario that applied here.

10 d (iii) The Principal Examiner felt that those who got this wrong have not had the required experience of SQL or writing queries for databases.

F454 Computing Project

General Comments:

This was the last standard session for this unit, but there was a large entry for the unit including a number of new centres. While most centres selected appropriate problems there were still a number of candidates from a number of centres who selected simplistic problems and were therefore not able to access all the mark points.

Projects must lead to multi-faceted solutions coded in a suitable high-level language. For the most part it is unlikely programs created in block programming languages, simple linear quizzes or projects based on the GCSE controlled assessment tasks for ICT or computing will be appropriate. Projects created in applications such as Excel, or Access or static websites created in HTML are also unlikely to meet the requirements for this unit.

It is not acceptable for the centre to allocate all students the same task, or for two or more candidates to attempt the same task. Each candidate must select a unique task and complete the work independently. Work must be clearly the unaided individual work of the candidate.

Investigations were, once again, a weakness with many relying purely on evidence gathered from an end user, often through an interview. Candidates should research the problem thoroughly, looking at similar solutions to similar problems to inform their designs.

Designs that concentrate on aesthetic considerations are also unlikely to score well; data structures, data flow and validation are among the other areas that must be considered. Algorithms were also a weakness with many providing simple overviews of the problem rather than detailed algorithms that described the intended solution in detail; rarely were these algorithms shown to describe a complete solution to the problem.

Development must show the process; from the initial coded elements through testing of each of these remedial actions, to the coded elements being combined into a working solution. Often we were presented with some code and some after-thought testing for functionality. Testing should show how it informed the process and post development testing should demonstrate how the system has been tested for robustness.

Many still rely on a user guide for documentation, programs should be internally documented and evidence of this should be provided as part of the documentation.

Having identified all of these issues there was much good work with detailed analysis and design and thoroughly documented development illustrated with test outcomes at each stage. The new specification includes a programming unit, but the approach, while having some similarities, is significantly different and it is important this is taken into account when planning for the new specification coursework unit.

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