OCR
Oxford Cambridge and RSA

GCE

Computer Science

Advanced Subsidiary GCE **AS H046**

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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H046/01 Computing principles

General Comments:

In general, candidate responses demonstrated subject knowledge appropriate to the specification. However, some candidates were evidently not fully prepared for the rigour of the examination. This was particularly evidenced in questions where candidates found it challenging to apply knowledge to a given scenario and the question where candidates were required to write LMC code and pseudocode.

The presentation of work was generally good. Candidates' handwriting on some scripts were difficult to read. Candidates should be aware that they may not gain credit for creditworthy responses if their handwriting is illegible.

Comments on Individual Questions:

Question No.
1a)
Few candidates gained full marks on this question. Many candidates described general characteristics of a network operating system rather than a distributed operating system. Fewer appropriately related their explanation to the scenario.

1bi)
Many candidates achieved some credit on this question but candidates did not achieve full marks due to lack of attention to detail in their description. Many candidates used phrases such as 'processor will run quicker/faster' without describing how a fast clock speed would enable this.

1bii)
Similarly, the lack of detailed responses limited credit achieved on this question. Many candidates used phrases such as 'large cache means faster processing' without describing how a large cache would enable this.

1c)
Candidates were assessed on the quality of their extended response in this question. Most candidates could describe each of the laws appropriately, with some applying them to the scenario. However, fewer candidates discussed the extent to which the laws could be applied in the scenario. Therefore limiting credit awarded, in many cases, to the low/mid level mark band. Centres should encourage candidates to structure their response to clearly address all parts of the question.

2a)
Many candidates used the correct term in relation to the automated process i.e. DNS but too many candidates found it difficult to clearly explain the stages of the process. Many responses lacked structure.

2b)
Many candidates gained credit for correctly identifying that the change of image could be implemented using Javascript (or similar). However, as with the previous question many candidates then found it difficult to explain how this could be implemented. Too many candidates rewrote the content of the question.

2ci)
2cii)
Both parts of this question were answered well by candidates who correctly addressed the question asked i.e. ethical issues relating to designing the website. With most correctly referring to accessibility issues, stating appropriate actions to address them. However, some candidates stated ethical issues relating to the designing/production of the bags themselves, therefore gaining no credit.

3a)
Many candidates failed to gain credit on this question due to the lack of attention to detail in their response, which is essential at this level of study. Some candidates responded with answers such as: 'the code branches if the result is positive'. Many candidates did not demonstrate understanding that it is the value in the accumulator which is being tested for whether it is positive or not.

3b)
The specification clearly outlines the LMC mnemonics which are acceptable in learners' responses. Some candidates used LMC mnemonics correctly, gaining some credit. Other candidates answered using procedural pseudocode gaining no credit. Centres are advised to ensure candidates have the range of LMC mnemonics at their disposal prior to sitting the examination.

4a)
This question was generally well answered. However, candidates who referred to the 'software' being freely available rather than the 'source code' did not gain credit.

4b)
This question was well attempted by most candidates although too many responses included the word 'compression' as part of their description without explaining their understanding of what compression means.

4c)
Most candidates gained credit for correctly writing pseudocode to calculate the estimated file size. However, too many candidates found converting between KB, MB and GB challenging. In addition, many did not write their pseudocode as a function and most output rather than returned the result.

4d)
Candidates were assessed on the quality of their extended response in this question.
Some candidates did not extend their discussion beyond the benefits and drawbacks associated with writing code in each of these programming languages, therefore limiting credit awarded to low/mid band. Those candidates who discussed the benefits and drawbacks of selling a closed source application written in each of the languages with a justified recommendation were credited in the mid/high band. Centres should encourage candidates to structure their response to clearly address all parts of the question.

5a)
This question was well answered, with most candidates achieving full marks.

5b)
Few candidates achieved full marks on this question. Many represented a normalised floating point mantissa with two of the same bit at the start.

5c)
Few candidates achieved full marks on this question. Many reducing the number of bits by deleting the leading zero's (from their response to 5b) rendering the result negative.

5d)
This question was reasonably well answered, with many candidates achieving the mark.

6a)
Many candidates achieved some marks on this question. However some did not use the terminology expected at this level of study e.g. data redundancy; data inconsistency.

6b)
Few candidates scored full marks on this question. Candidates invariably associated the 'cartridge' entity directly with the 'printer instance' entity, not gaining credit. Many diagrams had no indication of the degree of relationship between entities, again not gaining credit.

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

7)
This question required candidates to write an algorithm in pseudocode. Candidates are not required to write pseudocode in the form outlined in the specification Appendix 5e, any reasonable form of pseudocode was given credit, where appropriate. However, some candidate responses were written in structured English which is not an acceptable alternative to pseudocode at this level of study. Few candidates scored full marks on this question. Many candidates did not demonstrate the ability to correctly address a 2D array.

H046/02 Algorithms and problem solving

General Comments:

The paper differentiated candidates effectively. The paper targets three specific areas: Knowledge and Understanding, Application and Evaluation.

Questions that targeted Knowledge and Understanding required candidates to have studied the whole specification and to have learnt the relevant definitions. Some candidates had not been prepared by covering the whole specification and thus failed to achieve marking points targeted at lower grades for basic recall. Questions targeting Application required higher order skills to be able to use knowledge gained in context to solve problems. There was clear differentiation between candidates who understood the concepts and who could apply them, and those who displayed little ability to apply what they had learnt.

Many candidates struggled to write pseudocode. Structured English is insufficient for examination questions that specifically require pseudocode to be written. Candidates are not required to write pseudocode to the standard presented in the specification, and minor variations in terms of influences from programming languages are taken account of. Many candidates would benefit from more experience of writing pseudocode.

Comments on Individual Questions:

1   The programming constructs of sequence, iteration and branching are specifically identified within the specification. Many candidates were unaware of these named constructs. Of those who were, many then failed to give a working example as required by the question, but went on to describe rather than exemplify. Reponses such as looping were too vague as candidates are expected to know the correct technical vocabulary at AS Level.

2   This question required both a discussion of local/global variables **and** variable naming conventions for candidates to achieve a mark in the top band. The top band also required the correct use of technical vocabulary, which was often lacking. Many candidates achieved scores in the middle band by describing the different terms and giving examples of them. Fewer were able to analyse in detail the relative advantages and disadvantages of local and global variables as well as covering naming conventions.

3a   Many candidates scored well identifying a range of test methods.

3b   Few candidates could describe the fact that white box testing is used to test the logical pathways through a system. The context for the question was important, and again, few candidates identified that it was a safety critical system that could have harmful impacts on life or the factory and that these issues could only be prevented by having tested all pathways through the code via white box testing.

3c   Many candidates scored at least half marks on this question and it was effective at differentiating those candidates who could think mathematically and analytically.

4a   In general, many candidates had an understanding of how a binary search operated. Unfortunately, some gave a generic description rather than answering the specific question which required the candidate to illustrate how a binary search would operate on a specific data set. Some candidates drew concise and elegant diagrams with appropriate annotations that made their answers much clearer than those who wrote prose at great length.

4b   The Binary Search is one of the algorithms specifically identified in the specification that candidates need to be able to program and understand. It is a difficult algorithm to code correctly and only the most able candidates managed to produce a strong response to give the degree of accuracy required. Many candidates wrote in structured English which was not acceptable – the question specifically required a pseudocode solution. Candidates are not expected to be able to write pseudocode in the form given by OCR in the specification appendix, and variations from various programming languages were taken into account. However, the overall ability to write pseudocode proved to be a key differentiator and many candidates should aim to improve their ability to write pseudocode before the A2 examination.

4ci   Most candidates correctly identified that a list needs to be in order for a binary search to be applied. However, a worrying number of candidates thought that it could not be applied because there was an even number of items in the list, and hence no clear mid-point.

4cii   Many candidates identified a linear search, but fewer could give a full description as to how a linear search operates. A number of candidates confused searching with sorting algorithms.

4d   Many of the same comments regarding pseudocode as in 4b once again applied in 4d. An encouraging number of able candidates produced quite elegant solutions.

5a   Many candidates confused the concept of abstraction (simplification) with the requirement to make a genuinely realistic simulation.

5b   Many candidates answered well, but some misread the question and identified input devices that could be used within the simulation, rather than initial starting parameters as required.

6a   Many candidates gained some credit for this question, but many did not appreciate the fact that a file needed to be opened and closed.

6b   Few candidates understood the concept of passing by reference and passing by value which is in the specification. Greater programming experience using both methods would pay dividends for many candidates.

6c   Many candidates achieved some credit for this answer, but few could identify and expand upon a number of different points regarding the advantages of using a modular approach. This highlighted a lack of exam technique whereby candidates did not think about the number of separate points that they were expected to give to achieve the full six marks.

7   Candidates generally achieved some success, but few scored all four marks. Those who could reason logically and who understood the XOR function gained most credit.

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