# GCE

# Computer Science

Advanced Subsidiary GCE **AS H046**

# OCR Report to Centres June 2017

Oxford Cambridge and RSA Examinations

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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. The majority of candidates were evidently well prepared for the rigour of the examination. Some candidates found questions challenging where they were required to write programming statements or pseudocode.

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

**Comments on Individual Questions:**

Question No.
1ai)
Most candidates described a register as 'a memory location' with many going on to add 'in the processor' therefore achieving full marks.

1aii)
A number of different correct responses were offered here. Most candidates achieved the mark.

1b)
Well answered in the main, demonstrating an improvement in candidate understanding of LMC instruction set.

1ci)
Some candidates are omitting to state that the PC holds the 'memory location address' of the 'next' location to be accessed; both were needed to achieve the mark.

1cii)
Candidates tended to achieve either both or none of the marks in this question. Either the mnemonic or the full name of the instruction gained credit.

2)
Candidates were assessed on the quality of their extended response in this question. Most candidates could cite some methods for improving performance but not all managed to then appropriately apply these to the question. Many candidates did recommend one or more measures although some cases needed to include justification. This resulted in some very good responses and marks awarded spanning the range of marks available.

3a)
In general, candidates did not use technical terminology when describing the effect of the code e.g. declaring a variable, assigning an empty string, concatenating strings. Centres should encourage candidates to use these and similar terms in response to questions where they are required to describe code.

3b)
Most candidates could correctly describe a stack. Only some candidates could appropriately apply the use of the structure to the scenario.

4a)
Candidates were asked to complete a function in this question. Although many students demonstrated reasonable logic in solving this problem, some functions designed resulted in output, rather than returned values from the function and therefore did not gain full marks.

4b)
Most candidates gained both available marks on this question.

4ci)
Many candidates gave a reason for the advantage without stating the actual advantage e.g. 'flash storage has no moving parts' without going on to say, therefore the advantage is 'less likely to be damaged/lose data'.

4cii)
Candidates would be best advised to fully consider how they would justify their choice appropriately for the given scenario before committing to 'lossy or lossless'. Those who correctly chose 'lossy' went on to achieve at least one of the other two available marks.

5a and b)
Very well answered by the majority of candidates.

5c)
Well answered although candidates were required to show their binary working.

5d)
Again, this question was generally well answered with most candidates showing clear and logical workings.

6a)
There were very few candidates who could not correctly draw an XOR gate.

6b)
A lack of clarity of expression led to candidates not gaining credit in this question. Some candidates who achieved full marks supported their descriptions with correct two-input truth tables which clearly demonstrated the difference.

6ci)
This question was well received by candidates with most achieving full marks.

6cii)
Boolean expressions were in the main correct. All standard notations was credited provided it was used consistently.

7a)
Most candidates achieve zero to two marks on this question. Explanations generally contained errors or omissions. A fundamental explanation would suffice for full marks e.g. 'Transmission Control Protocol/Internet Protocol is a set of rules used for communicating across the internet'.

7b)
Most candidates correctly stated that 'fewer characters can be represented'

7c)
Candidates found this question challenging although there were many excellent solutions. Not all candidates noted in the question that 'Credit will be given for the readability of your code'. In many cases where candidates had attempted a solution which contained errors they were still able to gain marks for appropriate indentation and the use of sensible variable names.

8)
Candidates were assessed on the quality of their extended response in this question. Most candidates could cite some design measures which could be applied to aid accessibility. Few candidates described neither technical measures nor the technicality of implementing the design features.
Fewer candidates effectively evaluated the effect of their suggested measures. This resulted in few candidates achieving in the high mark band on this question.

# 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.

Once again, 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:**

| Question | Comment |
|---|---|
| 1ai | Most candidates knew that linear and binary were the required types of search. Some confused sorting algorithms with searching algorithms. |
| 1aii | Most candidates could describe some points related to the searching algorithm they identified, but fewer could go on to describe the steps in depth. |
| 1b/c | A number of students wrote Python and not pseudocode, often getting the loop range incorrect. Teachers would be well advised to deprecate use of Python specific syntax in place of pseudocode and make students write only features available in the pseudocode guidance in the specification. |
| 2a | Many candidates scored two marks for identifying a keyboard input and related character action. Some candidates failed to read the scenario in the stem clearly enough and identified different input devices rather than specific inputs. |
| 2b | Most candidates scored well, but some repeated items from the stem of the question and gave answers related to character movement which were not creditworthy. |
| 2ci | Most candidates had a good understanding of what parameters were and could hence answer the question well. |
| 2cii | Many candidates answered vaguely and could not describe in detail the condition that was implemented. |
| 2ciii | ByRef and ByVal continue to be an area that candidates struggle with. Those with experience of languages that implement this tended to do better. |
| 2d | Many candidates had prepared well by answering similar questions from previous papers. However, few scored within the top mark band. Candidates need to be mindful to contextualise their answers. Candidates who answered well took elements of game design that could be made reusable and explained them within context evaluating the advantages that such an approach gave. |
| 2e | Most candidates knew what abstraction was and could give relevant examples of how it could be applied. Fewer could answer in depth to achieve full credit. |
| 3a | Well answered by most candidates. |

| | |
|---|---|
| 3b | A number of candidates clearly did not appreciate how functions differ from procedures. |
| 3ci | Many candidates had a weak grasp of different testing methodologies and confused black box testing with alpha, beta and white box testing. This was disappointing as it was a question that could have been answered well from basic recall. |
| 3cii | Many candidates could suggest sensible values for normal test data, but fewer understood how extreme and invalid data differed. |
| 4a | Many candidates understood that a queue was a FIFO structure, but fewer could then go on to explain in context why this would then be a suitable data structure for the problem in context. |
| 4bi/ii | Many candidates would have scored well on this question if they understood that a queue is FIFO. Those who did not understand the basic properties of a queue struggled with the question. |
| 4c/d | Again, the use of pseudocode posed problems for many candidates. Those who had a wider programming experience were apparent from the well-crafted solutions. Those who gained credit generally gained two marks for understanding how the pointers were updated and how data was added/removed. Fewer scored full marks by also performing error checking. |

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