OCR
Oxford Cambridge and RSA

GCE AS Level

Computer Science

H046

OCR Report to Centres June 2018

About this Examiner Report to Centres

This report on the 2018 Summer assessments aims to highlight:

- areas where students were more successful
- main areas where students may need additional support and some reflection
- points of advice 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.

The report also includes links and brief information on:

- A reminder of our **post-results services** including **reviews of results**
- Link to **grade boundaries**
- **Further support that you can expect from OCR**, such as our Active Results service and CPD programmer

Reviews of results

If any of your students' results are not as expected you may wish to consider one of our reviews of results services. For full information about the options available, visit the OCR website. If University places are at stake you may wish to consider priority service 2 reviews of marking which have an earlier deadline to ensure your reviews are processed in time for university applications: http://www.ocr.org.uk/administration/stage-5-post-results-services/enquiries-about-results/service-2-priority-service-2-2a-2b/

Grade boundaries

Grade boundaries for this, and all other assessments, can be found on the OCR website.

Further support from OCR

activeresults

Active Results offers a unique perspective on results data and greater opportunities to understand students' performance.

It allows you to:

- Review reports on the **performance of individual candidates**, cohorts of students and whole centres
- **Analyse results** at question and/or topic level
- **Compare your centre** with OCR national averages or similar OCR centres.
- Identify areas of the curriculum where students excel or struggle and help **pinpoint strengths and weaknesses** of students and teaching departments.

http://www.ocr.org.uk/administration/support-and-tools/active-results/getting-started/

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Advanced Subsidiary GCE Computer Science (H046)

OCR REPORT TO CENTRES

H046/01 Computing Principles

In general, candidate responses demonstrated subject knowledge appropriate to the specification. The examination was evidently accessible to candidates and clearly differentiated effectively. Many candidates appeared to be well prepared for the written examination. That said, some candidates appeared to struggle with the rigour of the examination. To gain credit, it is important that candidates express themselves clearly when demonstrating knowledge. Some candidates struggled to do this, and therefore could not gain credit for responses.

Centres should encourage candidates to apply their answer to the context of the question when required. Many candidates lost marks through not contextualising their responses.

2. Comments on Individual Questions:

1a	Most candidates achieved the single mark available in this question.
1b	Many candidates scored at least one mark here, with some repeating the same point. Candidates should be reminded that, where appropriate, their response should be in context of the scenario. Those that were not lost credit.
1c	Some candidates did not gain credit because the advantage stated was not specific to the company, as the question asked. Candidates should be reminded to read the question carefully.
1d	Candidates invariably achieved a mark on this question for either stating that peer to peer networks allow the sharing of data or that all devices have equal status. Few achieved two marks for stating both of these points.
1e	Most candidates achieved the single mark available in this question.
1f	Most candidates achieved the single mark available in this question. Although some candidates incorrectly offered simply 'USB' as a response. USB is an interface, not a device.
2a	Many candidates gave an appropriate means by which the reading could be entered with some then describing with clarity how this device could be effectively utilised in context.
2b	Some candidates used incorrect logic in this question. Common issues included; incorrect use of the Boolean operator i.e. IF reading >=1 OR reading <=999999; inverse use of the returned value from the isNaN() function. Some candidates, even though the question specified that this was a function, did not return any value(s). Candidates were not penalised for slight errors in syntax.
2c(i)	Many candidates stated a valid definition for a device driver but some definitions were too vague to gain credit at this level of study.
2c(ii)	Most candidates correctly stated protocol(s) here.
2c(iii)	Surprisingly fewer than anticipated candidates achieved this mark. Candidates should be reminded that the use of proprietary names is not acceptable and will not gain credit.
3a	Only a few candidates scored well on both parts of this question. In the first part of the question, candidates rarely stated or described parallel processing. Those who did, then did not contextualise their response.
3b	Few candidates cited the 'Regulation of Investigatory Powers Act (RIPA)' correctly. Some candidates cited '…monitoring communications' for how the law is applied, which was given in the question therefore, in isolation, this did not gain credit.
4a	Many candidates correctly referred to the BIOS/bootstrap but then failed to clearly describe the process.

4b	Most candidates could correctly state an appropriate utility program.
4c	Candidates were assessed on the quality of their extended response in this question. Many candidates explained the difference between paging and segmentation, the use of virtual memory and scheduling very well. Some went on to describe the different scheduling algorithm techniques equally well and discussed the relative advantages of each function. Many candidates scored well on this question.
5a b c	A significant number of candidates achieved all three available marks across the first three parts of this question.
5d	This question was well attempted by most candidates. The methods used were invariably, clearly shown.
5e	Most candidates achieved both available marks. With the majority describing ASCII.
6a	The question required candidates to find the Boolean expression represented in the Karnaugh Map. Most candidates achieved a mark for showing the correct groupings on the map. Many went on to achieve the marks for the resultant expression. Alternative notations were accepted and credited.
6b	Most candidates achieved some credit on this question. There were some unusual representations for NOT gates. Candidates are best advised to use the representations listed in the appendix to the specification.
7	Candidates were required to write an algorithm and it was pleasing to see that most candidates responded reasonably well to this question. Common mistakes were: failing to initialise the counter variables; incorrect concatenation in the output; using separate IF statements when efficiency was required i.e. (nested IF's or SELECT CASE).
8	Candidates were assessed on the quality of their extended response in this question. Many candidates offered a balanced discussion outlining the advantages and disadvantages of using virtual machines in games development and testing. Some candidates went on to also discuss how virtual machines could be used to run intermediate code. Some conclusions were appropriately justified/reasoned. Many candidates scored in the mid-level band on this question.
9a	Most candidates correctly stated accumulator here.
9b	Most candidates correctly selected 'execute' on this question.
9c	It was evident from responses to this question that candidates are more practised in writing LMC code than in previous series. Most candidates achieved two marks for correctly inputting the value repeatedly. Many candidates did not achieve the third mark because they incorrectly used SUB 3 instead of referencing a memory location or correctly using immediate addressing i.e. SUB #3.

H046/02 Algorithms and Programming

1. 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 did not achieve marking points targeted at lower grades for basic recall eg bubble sort, linear search. It is important that key definitions are studied and learnt. Record structures in programming languages appeared to be poorly understood as a concept.

Questions targeting Application required higher order skills to be able to use knowledge gained in context to solve problems. Often, a good understanding of programming and logic would have enabled candidates to access a number of marks. There was clear differentiation between candidates who understood the concepts and who could apply them, and those who struggled 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.

2. Comments on Individual Questions:

1a	Most candidates understood the concept of a stack well and could fill the stack with the data given in the correct order.
1b(i)	Many candidates answered well and understood the difference between functions and procedures, knowing that functions have to return a value.
1b(ii)	Parameter passing by value and by reference continue to prove problematic to candidates, with many having a poor grasp of the concept. Those candidates who have used a variety of programming languages including those that allow for parameter passing by reference often had the practical experience to draw upon.
1b(iii)	Candidates are best prepared for this paper by having had practical experience of implementing data structures such as stacks and queues. A number of candidates did not read the whole stem of the question and assumed that the total number of elements was 10 instead of 20. The concept that the stack pointer points to the next space to be used in the stack was poorly understood. Those candidates with practical experience and the ability to read and interpret code did answer well.
1b(iv)	Tracing code execution is an area that continues to prove challenging to candidates. Candidates need to have experience of completing dry-runs of code and setting out a trace table in a logical manner. Where candidates did perform well the initialisation of the variables *total* and *add* before the main body of the loop was entered was often omitted.
2a(i)	The concept of record structures within programming languages is one that was poorly understood by most candidates.

2a(ii)	Stronger candidates often recognised that arrays can be indexed. Fewer recognised that the array could hold records, and that each record would contain the individual player's details.
2a(iii)	Nearly all candidates could successfully name an additional data structure.
2a(iv)	Most candidates successfully identified that a global variable would have scope throughout the program and would therefore be available within each subroutine. Fewer could expand on this in context.
2c(i)	Writing pseudocode is a skill that candidates need to practice. Most candidates successfully wrote a statement to input the number of players. Whilst many candidates then attempted to validate the input, few could write code that would successfully do this. When reading in the player names it was evident that many candidates struggled to index an array to store the names efficiently. Candidates also found difficulty using the dot notation to reference the *.playerName* and *.totalScore* values within each record.
2c(ii)	A number of candidates struggled to use the information that was gathered in c(i) and wrote code to input values rather than using the data stored in the *scores* array. However, more candidates were able to successfully attempt this question with appropriate pseudocode to loop through the *scores[ ]* array.
2d(i)	Most candidates identified the inefficiency of the bubble sort but fewer could expand upon this.
2d(ii)	Most candidates correctly identified that that the list to sort was small.
2d(iii)	Those candidates who had learnt the standard sorting algorithms had little difficulty producing good pseudocode for the bubble sort. Unfortunately, many candidates had not learnt the code for the standard algorithms.
2d(iv)	Candidates who were confident in analysing code often answered successfully and could calculate the correct way to index the *numbers[ ]* array.
2e	It was clear that nearly all candidates had experience of using an IDE and that they could successfully identify a number of features that an IDE provides.
3a(i)	The term abstraction was well understood and clearly defined by most candidates.
3a(ii)	A number of candidates did not read the question clearly and responded by giving examples of abstraction rather than reasons for abstraction being used.
3a(iii)	Many candidates could offer contextualised examples of differences between the real and the abstracted version of the system.
3b(i)	Most candidates knew that the list had to be sorted before a binary search could be performed.
3b(ii)	The majority of candidates described a linear search, but some described a binary search by mistake. Where candidates did describe a linear search, they generally did so with sufficient precision.
4	Most candidates were well prepared and knew about the waterfall model of software development as well as RAD. There were fewer responses where candidates commented on which method would be more suited to the given scenario. Evaluative comments for the higher level of response were also far fewer.

About OCR

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