



GCE EXAMINERS' REPORTS

**WJEC EDUQAS AS COMPUTER
SCIENCE**

SUMMER 2016

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Annual Statistical Report

The annual Statistical Report (issued in the second half of the Autumn Term) gives overall outcomes of all examinations administered by WJEC.

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COMPUTER SCIENCE

AS

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COMPONENT 1

Many of the candidates demonstrated that they understood and could answer questions on most of the specification. Candidates were obviously well prepared for this exam and many good answers were evident with numerous candidates giving extended answers where appropriate. However, it was slightly disappointing to see many candidates not giving enough technical detail on traditional computing topics like programming paradigms and modes of operation.

Individual Questions

1.
 - (a) Many candidates were able to accurately complete the truth table for A OR B, A AND B and A XOR B expressions, but only a minority of candidates were able to complete the truth table for the more demanding A OR (NOT B) expression.
 - (b) The majority of candidates were able to show how a logical operation can be used to discover the state of the most significant bit. A significant number of candidates tried to use the XOR logical operation.
2. Most candidates were able to describe cache memory in a Central Processing Unit, but only a minority were able to give advantages of using this memory. A significant number of candidates confused this memory with Random Access Memory.
3. The majority of candidates were able to discuss the benefits of solid-state drives compared with magnetic hard disc drives, with many candidates showing their knowledge of the non-mechanical design of NAND flash mounted on circuit boards in SSDs.
4.
 - (a) Most candidates were able to correctly state what is meant by the term handshaking.
 - (b) Many candidates were able to name a standard networking protocol, with a majority of candidates describing its function. Very few candidates went on to describe the importance of their chosen protocol.
5.
 - (a)
 - (i) Most candidates were able to correctly calculate the storage requirements for an integer data type within an unsigned range of 0_{10} to 255_{10} .
 - (ii) This question was poorly answered with only a few candidates able to give the range for a signed integer data type with the same storage requirements as question 5(a)(i).
 - (b)
 - (i) Only a minority of candidates were able to describe the use of standardised character sets.
 - (ii) This question was poorly answered with only a few candidates correctly comparing the storage requirements for a character and a string data type which uses a standard character set.

6. The majority of candidates were able to discuss the benefits and drawbacks of two different methods of investigation available to a systems analyst.
7. Only a minority of pupils were able to explain how the Computer Misuse Act 1990 aims to improve data security. A significant number of candidates confused this question with the Data Protection Act 1998.
8.
 - (a) Most candidates were confident in converting from the hexadecimal to binary number system. Fewer candidates were as confident in using binary addition and converting their answer into a denary number. A few candidates lost mark as they did not demonstrate their working for the binary addition.
 - (b) Many candidates were able to describe two's complementation and sign and magnitude representation in an 8-bit register. A few candidates lost a mark where they did not mention that the most significant bit is used as a sign bit in sign and magnitude representation.
 - (c)
 - (i) This question was poorly answered and many candidates struggled.
 - (ii) This question was poorly answered and most candidates struggled. In particular, candidates were unable to convert their answers into denary as the question required.
9. A minority of candidates were able to write a fully functioning linear search algorithm. Most candidates input *SearchValue*. Very few candidates declared the array and a significant number of candidates did not include a clear increment in their loop structure.
10. Around half of the candidates were able to simplify the given Boolean expression. Some candidates were penalised where they hadn't clearly shown each step.
11. A minority of candidates were able to explain the concept of open source software. Some candidates had merely stated that "it's free". At this level, candidates were expected to show an awareness of licensing and the General Public License.
12.
 - (a) A minority of candidates were able to describe syntax analysis in the compilation process. Many of these candidates were penalised where they had stated that syntax analysis "checks the syntax of the code". At this level, candidates were required to show understanding of tokens and the fact that they are checked to see if they match the spelling and grammar expected.
13.
 - (a) Most candidates were able to recognise that the algorithm provided was a bubble sort algorithm. Fewer candidates were able to correctly state its function by stating that the algorithm "swaps data", but not stating in which order.
 - (b) A majority of candidates were able to correctly show the effect that the given algorithm had on the data in the array.
 - (c)
 - (i) A minority of candidates were able to state why the algorithm would fail if two values were the same. Very few candidates went on to fully explain why the algorithm would fail by stating that the algorithm would never finish and that 'swapped' would never become 'FALSE'.
 - (ii) A few candidates were able to suggest a suitable change that could be made to the algorithm to overcome the problem.

14. This question was the most poorly answered question of the whole paper.
- (a) A few candidates were able to describe the distinguishing features of a procedural language programming paradigm. Many seemed unfamiliar with this topic.
 - (b) Very few candidates were able to describe the object-oriented approach to programming. Most seemed unfamiliar with this topic.
15. This question was poorly answered and many candidates seemed unfamiliar with the modes of operation topic.

A few candidates wrote a response that showed an adequate understanding of the requirements of the question and a satisfactory knowledge of modes of operation and input/output methods. These candidates used appropriate technical terminology referring to the indicative content in the mark scheme.

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COMPONENT 2

Introduction

Component 2 is a practical examination with candidates needing to demonstrate the application of knowledge and understanding.

General Comments

Most of the candidates demonstrated a good understanding of the specification and attempted most of the questions. Many candidates were well prepared and many excellent answers were evident. There was evidence also that candidates had been well prepared for the majority of the practical programming elements found in question 4.

Comments on Individual Questions

Q.1 This was generally not well answered by candidates. Candidates did not use technical terminology such as class, object, method, inheritance, public, private or parameter well.

Q.2 Many good answers were seen here, with candidates able to trace through an algorithm and provide the outputs/contents of variables. However, candidates' understanding of the errors caused by truncation was sometimes disappointing.

Q.3 As is the case with algorithm questions, some candidates scored full marks but a large number seemed to have no clear idea about algorithm design.

Q.4 (i) This was generally well answered with candidates either scoring very highly or not gaining any marks. It was pleasing to see that most centres had thoroughly prepared candidates for the prospect of fixing "broken" code. Python was the most popular language opted for by candidates, with Visual Basic being the second most popular and the least used was Java.

NB. With Java most centres used the recommended Netbeans IDE with some centres using Eclipse and a small number of centres using BlueJ. Unfortunately, from the evidence seen, BlueJ was not well suited to the demand of an AS-level paper

(ii) Generally not well answered. Many candidates were neither able to implement validation checks nor deal with file handling.

(iii) This question was generally well answered. Many candidates showed detailed annotation of the code.



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