



GCE AS EXAMINERS' REPORTS

**COMPUTER SCIENCE
AS**

SUMMER 2023

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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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COMPONENT 1: FUNDAMENTALS OF COMPUTER SCIENCE

General Comments

The mean total for Component 1 this series was approximately 30 out of 100 marks. This represents a substantial decrease when compared with the mean total of 47 out of 100 in 2019.

The effect of the pandemic remains evident in candidates' literacy skills and their use of technical terminology, but less so than in 2022.

Comments on individual questions/sections

- Q.1 This was the best answered question of the paper. Around half of candidates were able to complete the table giving three data types and their storage requirements.
- Q.2 This was the joint-second worst answered question of the paper. A minority of candidates were able to state each step showing how a dual-core processor would process a calculation. A few were able to state why the calculation cannot be processed in fewer steps.
- Q.3 A minority of candidates were able to explain data fragmentation and why the functional characteristics of a solid state drive (SSD) mean that its performance is not affected by fragmented data.
- Q.4 Around half of candidates were able to demonstrate how the state of the second least significant bit can be discovered using a logical operation. Many candidates were able to identify AND as a suitable logical operation, but fewer seemed familiar with the phrase 'least significant bit'.
- Q.5 This was the worst answered question of the paper. Very few candidates were able to explain the possible benefits of standard functions. Incorrect answers of a standard function included if statements. A few candidates were able to describe the advantages of using an assembly language over a high-level language.
- Q.6 This was the second worst answered question of the paper. Many candidates incorrectly simplified the $Y \cdot (Y \cdot \bar{Y})$ aspect of the expression to $Y = Y \cdot Y + Y \cdot \bar{Y}$. This resulted in 0 marks being awarded. For other candidates who did not make this mistake, they often attained full marks.

- Q.7 A minority of candidates were able to determine the closest possible denary representation of 8.6 using this given system. Fewer candidates were able to calculate the absolute and relative error that had occurred. Around half were able to state how the floating point system could be modified to allow a more accurate representation of 8.6.
- Q.8 A minority of candidates were able to complete the algorithm which allows a user to input a student's ID to be deleted and then removes that record from the file. In particular, marks were lost for the skipping the deleted record, copying the rest of records into the tempFile and replacing the gradesFile with tempFile. Many candidates were able to describe the need for archiving certain files.
- Q.9 A minority of candidates were able to describe the role of the operating system.
- Q.10 A minority of candidates were able to describe two applications that use different modes of operation.
- Q.11 This question was the third best answered question of the paper. Around half of candidates were able to identify the error in the bubble sort algorithm and suggest a suitable change to the algorithm. The majority of candidates were able to correctly identify and describe the purpose of two different types of repetition used in this algorithm and one type of selection. A minority were able to state an alternative type of sorting algorithm and describe its characteristics.
- Q.12 This is the first time that this topic has been assessed for this specification and it was the third worst answered question of the paper. A few candidates were able to describe what can be achieved by packages in relation to 2D and 3D images and modelling. Often answers lacked depth beyond describing the creation of 3D objects, characters, environments or building structures.
- Q.13 A minority of candidates were able to describe contemporary processes that protect the security and integrity of data.
- Q.14 Around half of candidates were able to describe the purpose of a feasibility study and give examples of the considerations that an analyst would make. These candidates attempted to address the question by providing a written response that has an adequate line of reasoning with elements of coherence, relevance, and logical structure. They showed an adequate understanding of the requirements of the question and a satisfactory knowledge as specified in the indicative content and used appropriate technical terminology.

Some candidates incorrectly wrote about the analysis stage of systems analysis, describing the use of interviews, questionnaires etc.

Summary of key points

Candidates had a reasonably good understanding of data types and storage requirements, masking, and sorting algorithms and algorithm constructs. They performed best in these questions.

Candidates found the questions on standard functions and low-level languages, Boolean algebra, and computer-generated graphics. This was reflected in the low facility factor for these questions.

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COMPONENT 2: Practical Programming to Solve Problems

General Comments

Component 2 is a practical examination with candidates required to demonstrate the application of knowledge and understanding at all times.

Most of the candidates demonstrated a good understanding of the specification, question attempted percentages were not available this series. Many candidates were well prepared, and many excellent answers were evident. There was evidence also that some candidates had been well prepared for some of the practical programming elements.

Comments on individual questions/sections

- Q.1 This was generally not well answered this series with multiple mistakes in ER diagrams and a weaker understanding of relationships between entities.
- Q.2 Candidates needed to extract details from the scenario to build a data structure form. This was generally well answered.
- Q.3 This was considered to be a demanding question, requiring practical application of modelling to decompose a problem and present it as a data flow diagram. Some good attempts were seen here; however many candidates confused a DFD with a flowchart.
- Q.4 As is usually the case with algorithm questions, some candidates scored full marks, but a large number seemed to have no clear idea about algorithm design.
- Q.5
- (i) This was generally not well answered this series. It was disappointing to see that some centres had not thoroughly prepared candidates for the prospect of fixing “broken” code.
 - (ii) This question required candidates to program a solution to a new problem. Credit was given for functionality however the candidate had implemented it.
 - (iii) This question was generally well answered. Many candidates showed detailed annotation of the code they had used.

Summary of key points

With regards to the practical programming aspect: Python was the most popular language opted for by candidates, with Visual Basic being the second most popular and the least used was Java.



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