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Examiners' report

COMPUTER SCIENCE

H446

For first teaching in 2015

H446/02 Autumn 2021 series

Version 1

Introduction

Our examiners' reports are produced to offer constructive feedback on candidates' performance in the examinations. They provide useful guidance for future candidates.

	Reports for the November 2021 series will provide a broad commentary about candidate performance, with the aim for them to be useful future teaching tools. As an exception for this series, they will not contain any questions from the question paper nor examples of candidate responses.

The reports will include a general commentary on candidates' performance, identify technical aspects examined in the questions and highlight good performance and where performance could be improved. The reports will also explain aspects which caused difficulty and why the difficulties arose, whether through a lack of knowledge, poor examination technique, or any other identifiable and explainable reason.

A full copy of the question paper and the mark scheme can be downloaded from OCR.

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Paper 2 series overview

The Algorithms and Programming paper requires candidates to be familiar with a wide range of standard algorithms that can be applied to data structures. This session's examination required detailed knowledge of:

- graphs
- A* pathfinding algorithm
- breadth first traversal of trees
- the binary search algorithm
- the principles of the quicksort algorithm.

	**AfL**	Candidates who prepare for examinations by implementing data structures and algorithms gain the practical experience. This practical experience is vital to developing a deeper insight. It is recommended that candidates are given the opportunity to extend their programming skills through the implementation of data structures and their associated algorithms.

Candidates who did well on this paper generally did the following:	***Candidates who did less well on this paper generally did the following:***
• Showed detailed knowledge of algorithms such as the A* pathfinding algorithm and the quicksort algorithm. • Wrote clear, well-structured pseudocode when presented with problems to solve. • Produced coherent, detailed, and analytical answers, for the level of response questions. • Exhibited detailed knowledge of the object oriented programming paradigm including the use of constructors and inheritance.	• Showed limited ability to formulate algorithms using pseudocode. • Demonstrated little understanding of object oriented programming. • Struggled to apply their knowledge to solve problems and hence show deeper understanding.

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Common misconceptions

It was clear that many candidates did not understand the difference between Big O space complexity and time complexity.

Many candidates did not appreciate the midpoint of a binary search is calculated using integer division by 2.

Many candidates were unfamiliar with the concept of a Repeat…Until post condition loop or equivalent. This is potentially because of only having experience of programming using Python.

Guidance on using this paper as a mock

If the paper is used as a mock, it would be worthwhile following up with a review and subsequent implementation of the coding-based questions. Suitable exercises include modelling both the OOP scenario in Question 5 and the generic Nonogram problem in Question 8.

Candidates who code solutions to the algorithms in the questions will gain a greater depth of understanding and appreciation of the subject material.

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Supporting you through 2021-2022

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Supporting you

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For the Autumn 2021 series, results analysis is available for GCSE English Language, GCSE Mathematics and Cambridge Nationals (moderated units) only.

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