

**GCSE (9–1)**

**Examiners' report**

# **COMPUTER SCIENCE**

**J276**

For first teaching in 2016

**J276/01 Autumn 2020 series**

## 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 Autumn 2020 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 answers.

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 1 series overview

This theory paper covers specification sections 1, including: Systems architecture, memory, storage, wired and wireless networks, network topologies, protocols and layers, system security, system software, ethical, legal, cultural and environmental concerns.

There are a total of 80 marks. The exam is a non-calculator paper, with 1 hour 30 minutes allowed time.

Fewer candidates took this examination than in previous series. The candidates tackled the questions well. There were some well thought out responses to questions.

Candidates did particularly well in the question relating to threats and preventions methods. Sensible methods of prevention were given for the identified threats.

Candidates demonstrated a good understanding of networks and were able to apply their knowledge of wireless networks to Hope's home network. There were a good range of responses to how she could improve the performance. These included using further boosters, to changing to a lower frequency to allow the signal to travel further.

Question 6(c) required candidates to apply their understanding of virtual memory and convert this into an algorithm. Candidates tackled this question well; they considered the possible answers and many selected correct responses. The most challenging aspect was to check if NOT (data required is in RAM).

Candidates were given the opportunity to argue whether a tablet is an embedded system, or not. With either answer being acceptable but candidates were required to justify their choice. This required application of the question to the scenario of the tablet. Candidates often gave generic definitions of what an embedded system, without any application to the tablet and whether this meets the definition of an embedded system or not.

### ***Candidates who did well on this paper generally did the following:***

- Applied their knowledge to the scenarios in the question, for example in Question 2 relating their responses to Hope's home and the devices in her network.
- Gave a balanced discussion in their response to the quality of written communication question.

### ***Candidates who did less well on this paper generally did the following:***

- Gave generic statements that did not make suitable use of the given scenario. For example in Question 2(e) candidates gave generic descriptions of cloud storage and did not always consider how these apply to Hope.
- Expanded their responses in descriptive questions such as Question 2(e).

## Comments on responses by question type

### Level of response questions

Candidates often read the word 'issues' and associated this with negative issues. Candidates often presented suitable and detailed responses explaining the problems that could occur with the use of Artificial Intelligence in medical testing.

Candidates needed to look at all sides of the argument. There were many positive issues that could have been discussed. Positive arguments were often missed.

The most common responses referred to the replacement of researchers and the loss of jobs.

Candidates gave good explanations of the potential impacts on society. A common second drawback was a possible lack of trust by people in the use of AI.

Positive points included the increase in speed. This was given in the question. But, candidates found it challenging to relate this to ethical, legal or cultural issues; hence these points were often given briefly and not fully explored.

Candidates need to link all points to the scenario. The question focus was AI in medical testing. Some responses strayed into detailed discussions around other AI applications such as self-driving cars.

While there may be similarities in the points identified, candidates need to be explicit in their application to the scenario in the question.

Many candidates gave suitably structured essay responses. Some used a table structure, with positive and negative headings. They wrote descriptions in clearly identifiable points beneath each heading. This format allowed candidates to consider both sides of the argument by including positive and negative points, while still giving detailed explanations.

### Explain

Question (b)(ii) required candidates to explain why the computer accesses the files faster after defragmentation. The question told candidates that the files were accessed faster, and they needed to explain why this is the case.

Candidates found this challenging and often repeated the question in different ways. For example some stating that they can access the files faster because it's defragmented. Candidates needed to delve into **why** it is faster, considering the movement of the read head and positioning of the files.

	<b>Misconceptions</b>	<p>Candidates associated the word 'issues' with negative points, whereas positive and negative points should be covered.</p> <p>Increasing the network frequency will increase the strength.</p> <p>In response to Question 2(c)(ii), candidates often stated that increasing the frequency will allow the signal to travel further. Candidates were mixing up the amount of data that can be sent at a time, with the distance that signal can travel.</p> <p>Question 2(c)(ii) asks candidates to explain how the wireless network performance can be improved. Some candidates described using wired connections, which did not answer the question.</p>
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## Key teaching and learning points – comments on improving performance

### Level of Response (quality of written communication) questions

Candidates need experience of looking at all sides of a scenario. This could be through debates where candidates need to argue for one side.

Candidates often do well when they plan before responding. This helps to keep focus when writing.

### Guidance on using this paper as a mock

When marking the responses take note of the annotations in the mark scheme.

- Marks are usually given as 1 per bullet point, unless otherwise stated. For example, Question 1(b) uses (1) to indicate where a mark can be given.
- If a candidate gives two responses that meet the same bullet point then only 1 mark is given.
- The use of a // on a line indicates an alternative response for that bullet point. Only 1 mark can still be given.
- The use of a / on a line indicates an alternative word e.g. Use of proxy server/firewall; this reads as use of proxy server or use of firewall. Either can be given a mark, but maximum of 1.
- The use of bold indicates that that idea must be present. It can be expressed in a variety of ways, but that idea must be present. For example, in Question 2(d) '**No** server required'. The word 'no' does not need to be present but the idea that there is not a server is needed, e.g. 'The network doesn't need a server', meets this.
- There is no use of underline in this mark scheme. However its meaning is given here for clarity. The use of underline indicates that that word or phrase **must** be present. Alternatives that have the exact same meaning can be awarded. but they must be clearly present to be given the mark.

### Marking the quality of written communication question

It is important to read the whole response first. Then determine which band is most suited.

#### Top band

'The candidate is able to weigh up both sides of the discussion'. This means including both the positive and negative issues associated with the use of AI in medical testing.

#### Mid band

This does not require both sides of the discussion to be present. It does need 'a reasonable attempt to discuss the impact on most areas'. In this question that includes ethical, legal and cultural issues.

#### Lower band

The lower band requires a 'limited attempt to apply acquired knowledge and understanding to the context provided'. These responses may be about AI in general, and not necessarily related to the AI in medical testing.

Once the most suitable band has been selected, the mark within the band needs to be determined. This depends on the amount of relevant context, the suitable expansions, structure of the response, appropriate use of terminology and overall understanding that is conveyed. It is important to realise that the top marks (7 and 8) are not reserved for the best possible responses, any responses that meet the requirements can be given these marks.

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