Examiners' Report
Principal Examiner Feedback

Summer 2023

Pearson Edexcel International GCSE
In Computer Science (4CP0)
Paper 01 Principles of Computer Science

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SPECIFIC COMMENTS

Question 1

1a The majority of candidates answered well. The most popular answers were shared peripherals, access to the internet, and communication. Most candidates obtained at least one mark.

1b(i) This multiple choice question was answered well by most candidates.

1b(ii) This question was generally well answered. Most candidates understood the concept of physical means. CCTV, security guards and locks were the most popular answers. Several candidates answered with passwords, but this on its own, was not accepted if it was not clear that it referred to a specific physical lock.

1b(iii) Many responses recognised the fact that people were tricked when social engineering measures such as phishing were employed.

1c This multiple choice question was answered well by most candidates.

1d Modular testing seemed to be poorly understood by many candidates. Many candidates failed to gain credit because they either used 'module/modular' in their answer, repeating the question, or talked about testing in general. Most successful responses recognised the idea of blocks, sections, or chunks of code being tested independently.

1e Overall this question was answered quite well, although in many cases candidates lost marks by repeating two examples of ethical/legal behaviour. Many candidates found it difficult to contextualise their answers to specify how computer scientists could demonstrate professionalism and gave generic answers that could have applied to any profession.

Question 2

2a Many candidates found this to be an accessible question with the vast majority gaining full marks.

2b This multiple choice question was answered very well.

2c(i) Many candidates demonstrated a good understanding of logical shifts and gave the correct response.

2c(ii) Candidates found arithmetic shifts to be far harder to implement than logical shifts, with many performing a logical shift instead of performing an arithmetic shift. This proved to be a very challenging topic for many.

2d(i) Conversion of an unsigned integer to 8-bit binary was very well understood by nearly all candidates.

2d(ii) Sign and magnitude was relatively well understood.

2d(iii) The numerical process to negate a binary number in two's complement form was reasonably well understood with most candidates gaining some credit.

2e The construction of an expression was not as well answered as many of the other numerical questions. Some candidates produced very complex answers. Most gained at least one mark either for numerator, recognising 13*1000, or for the denominator being 1024. Whilst many candidates did achieve both marks it was apparent that a significant number of candidates could not distinguish between kilobytes and kibibytes.

Question 3

3a This question was answered very well by some candidates, but many described a consequence, such as inaccurate results, without explaining why this would come about.

3b(i) Many candidates found this to be a surprisingly challenging question. Many responses stated pixels without any unit of measurement beyond this.

3b(ii) This question was not well answered. Candidates frequently answered erroneously that the number of pixels would increase. Some candidates simply said more storage would be required which simply repeated the question. Some candidates quoted a formula for file size without explanation or expansion.

3c This was not well answered. Many candidates erroneously stated that system software is put on a system before purchase and cannot be deleted or that application software is installed after purchase. Marks achieved were most often awarded for system software controlling the hardware. Descriptions of application software were often vague with many candidates not relating application software to the user or to the ability to carry out general tasks that did not relate to the operation of the computer. A few gave examples such as spreadsheets or games. A stock answer was that application software did tasks that would otherwise be done by hand – without explanation or expansion this could include washing up or ironing.

3d Many candidates achieved some degree of success for ordering file blocks contiguously.

3e Most candidates obtained at least one mark mainly for increased file size overall. Marks were lost through failure to recognise that electricity readings would have few repeating sequences and that this was the reason for the file size increase in this context. Some responses explained the effect of run-length encoding on files in general, therefore not gaining credit. Other erroneous responses included sorting the data into order rather than looking at compression.

3f Many candidates found it difficult to give valid uses for different types of translation software. This continues to be a topic that candidates find challenging.

Question 4

4a This multiple choice question was reasonably well answered. The most common incorrect response was often Megabytes per second.

4b Many candidates found this to be a challenging question. Frequent incorrect responses gave an expression such as 2^{32} for the total number of addresses rather than specifying that 32 bits were used.

4c(i) This question was not as well answered as other questions. Many candidates gave answers about relative speeds of wired/wireless transmission or the security of wired/wireless networks. Whilst some candidates recognised that wireless transmission used waves, responses only gave waves and not radio waves.

4c(ii) This question was not well answered, with many candidates who attempted it simply stating wires rather than clearly identifying that Ethernet is a specific standard/type of cable used in wired networks. Few candidates identified it as a protocol. The strongest candidates did give some good responses.

4d Many candidates achieved some success, most frequently by identifying at least one relevant component. Relatively few candidates could identify all three components in the correct order.

4e Many candidates failed to achieve full marks for this question. Answers often stated that validation checked for valid data without giving an expansion as to what this meant or how it would be achieved. Responses for authentication often relied on username and password as a means of proving identity. Many candidates confused the terms validation with authentication in their examples.

Question 5

5a This question was well answered by the majority of candidates.

5b(i) This question was well answered by most candidates, although some missed marks for omitting the two-way link between CPU and USB.

5b(ii) This was a more challenging multiple choice question with relatively few candidates successfully identifying BIOS.

5b(iii) This question was very well answered by many candidates, with many gaining some credit for identifying the fact that cache is high speed memory. Fewer candidates went on the explain how this acted as a buffer between the CPU and main memory.

5c Most candidates obtained at least one mark for this question, mainly for the description of the embedded system. Marks were often lost identifying the embedded component, with many candidates showing limited knowledge of the types of sensors and actuators available.

5d(i) Many candidates gave good responses achieving all 3 marks.

5d(ii) Some answers did not give the logic statement asked for but showed a circuit diagram instead, which did not gain credit. Many achieved some credit for one of the parts of the required logic statement, but relatively few gave an entirely correct statement.

5e This was generally answered in rather vague terms and many candidates referred to multiple cores and therefore did not gain credit because the question referred to a single CPU. Those candidates who successfully identified that time-slicing was one mechanism that could be used less frequently went on to expand on swapping or scheduling of tasks.

Question 6

6a Most candidates gained at least one mark for identifying a method but struggled to give a valid justification. Many candidates restated the question saying it would be 'easy for non-technical managers to understand' rather than explaining how or why.

6b This was generally answered very well by those candidates who attempted it, although there were a large number who did not.

6c(i) This was generally answered well by those who attempted it, although there were a large number who did not. Many candidates continue to struggle to show an understanding of what a given piece of code does.

6c(ii) This was generally answered well by those who attempted it, although there were a large number who did not.

6d This was well answered on the whole, with most candidates gaining at least three marks. Many responses focused on hacking, potential bankruptcy, and lack of confidentiality in service providers with simplistic reasoning. However, there were some very well structured and detailed responses that made more nuanced arguments.

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