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COMPUTER SCIENCE

Paper 0478/12
Paper 1

Key messages

Candidates continue to demonstrate a good level of knowledge about the fundamental aspects of computer science. It would be beneficial for candidates to consider the context that is given in some questions. Candidates should look to reflect the application of this context in the knowledge and understanding they are required to demonstrate. This would allow candidates to demonstrate a greater level of understanding, beyond a general response, about the topic in question.

General comments

Candidates are reminded to make sure that they do not write outside the given writing space in a question. If additional writing space is required, candidates should use the additional pages available. They should make sure they clearly indicate the question for which they are providing a further response.

Comments on specific Questions

Question 1

(a) Many candidates were able to match the correct component with the correct description. The most common incorrect answer was the confusion of the memory data register and the accumulator.

(b) Most candidates were able to provide two correct buses. Some candidates had not noted the use of control bus in the question and incorrectly provided this as an answer.

Question 2

(a) Many candidates were able to choose the correct method and type given in each description. The most common incorrect answer was for the last description. Some candidates indicated this to be serial transmission, rather than parallel transmission. It is possible that these candidates did not recognise that serial data transmission can occur in both directions.

(b) (i) Many candidates were able to provide the correct parity bit.

(ii) Many candidates were able to provide a correct response. The most common correct response was that the bits had been transposed. It would be beneficial for candidates to understand that accuracy is important in technical answers. Some candidates stated that more than one bit had been interchanged. It would help candidates to understand that it accurately needs to be an even number of bits that are interchanged for the error not to be detected.

(c) (i) Most candidates were able to provide a description of encryption. It would be beneficial for candidates to understand that encryption will not stop data being read. It would be helpful for candidates to know that the perpetrator is still able to read the data, they will just find it meaningless.

(ii) It was pleasing to see candidates also suggestion asymmetric encryption as a way to strengthen the encryption, as well as extending the length of the key. Although asymmetric encryption is not an element of the syllabus, and candidates are not required to have this knowledge, some candidates has read beyond the syllabus and were rewarded for including it in their answer.

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(d) Few candidates were able to provide a description that was awarded full marks. Many candidates listed the methods that can be used. It would be beneficial for candidates to note the full extent of the question requirements and include a description of how each method would aid the prevention of the loss of data.
It was pleasing to see a wide range of different methods given by candidates.

Question 3

(a) (i) Many candidates were able to provide a suitable similarity between the two examples of storage. The most common response was that they are both types of secondary storage.

(ii) Some candidates were able to give three full differences between the two examples of storage. It would be beneficial for candidates to understand that if they are asked to provide a difference between two different items, they must refer to the same aspect for both items in their response. For example, some candidates only stated that HDD has moving parts, but it would be helpful for candidates to understand that they also need to expand this to say that an SSD does not have moving parts.

(b) Many candidates were able to provide a suitable example of the requested storage. The most common answer given was USB flash memory drive. It would be beneficial for candidates to understand that accuracy is important in their answer. Some candidates only gave USB as their response. As USB is a form of data transmission, candidates need to be specific in stating it is a USB device, to be accurate for a storage example.

(c) (i) Most candidates were able to provide suitable input devices.

(ii) Most candidates were able to provide suitable output devices.

(d) Some candidates were able to provide a response as to how the data would be compressed. It would be beneficial for candidates to note the requirements of the question. Some candidates gave the benefits of the compression method, rather than describing how the data would be compressed. It would also be beneficial for candidates to note any context given in the question. The context given in this question was about a sound file, but some candidate wrote about repeating words being indexed, which would only be applicable to a text document.

(e) (i) Few candidates were able to demonstrate understanding of the features of a MIDI file. It would be beneficial for candidates to have a greater understanding about this area of the syllabus. Many candidates gave responses about the MIDI interface, rather than a MIDI file.

(ii) Many candidates were able to provide suitable features of an MP3 file. The most common response given is that it uses lossy compression.

Question 4

Many candidates were able to provide the correct identification of translators for each statement. The most common incorrect response was confusing the translator that provides an executable file. Some candidates identified this as an interpreter.

Question 5

(a) Few candidates were able to provide a suitable response as to why a computer requires binary. It would be helpful for candidates to have a technical understanding of the need for binary. Most candidates only suggested that a computer only understands binary. A greater level of technical detail as to why this is would help candidates greatly.

(b) Most candidates were able to correctly convert the values. It would be beneficial for candidates to note the number of bits of the binary if it is given in the question. Some candidates lacked accuracy in their answer as they did not provide an 8-bit binary value, it would be helpful for candidates to understand that in cases where the conversion does not provide 8-bits, they need to add leading zeros to create an 8-bit value.

(c) Most candidates were able to provide three correct conversions.

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(d) Most candidates were able to provide two correct uses. It would be beneficial for candidate to understand that accuracy is important in their answer. Some candidates were too brief in their use, for example providing HTML as a response, but not being specific about which part of HTML. It would be helpful for candidates to understand that his level of accuracy is required.

Question 6

(a) Many candidates were able to provide a correct truth table.

(b) Some candidates were able to provide a correct logic circuit.

Question 7

Few candidates were able to provide an answer that gained full marks. It would be beneficial for candidates to note any context given in a question and reflect this context in their response. It would be helpful for candidates to apply this context and provide specific conditional values if they are given in the question. Many candidates gave a very general response about how a sensor and microprocessor operate, without tailoring this to the context given.

Question 8

(a) Some candidates were able to provide different functions of a web browser in the given context. It would beneficial for candidates to note the context given in the question. Many candidates gave general functions of a web browser, rather than those tailored to the context given.

(b) Many candidates were able to provide a suitable description of the attack.

(c)(i)(ii) Some candidates were able to provide understanding that copyright is legislation. It would be beneficial for candidates to have a greater understanding of the difference between what copyright is and what plagiarism is. Many candidates gave a very similar definition of copyright, to the one they gave for plagiarism. It would be helpful for candidates to understand that copyright is a form of legislation.

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COMPUTER SCIENCE

Paper 0478/22
Paper 2

Key messages

Candidates who had completed the tasks for the pre-release (car buying service) were able to provide answers for ***Section A*** that showed good understanding of the tasks undertaken. Candidates, who read each question carefully and answered the question, as set on the paper, performed better than those who had memorised their solution and used all of that information without considering what information needed to be included in their answer.

Candidates should take care when declaring variables, constants and arrays to ensure that the identifier declared could be used in a program. Identifier names must not contain spaces. Once declared the same identifier name should be used throughout the answer.

Questions asking for an explanation about a section of a program, for example **Questions 1(c)** and **1(e)**, require the candidate to explain what this part of the program does as well as quoting any programming code used.

General comments

Most candidates attempted all the question parts in ***Section A***. **Question 1 (e)** was sometime omitted. Nearly all candidates attempted all the questions in ***Section B***.

Comments on specific questions

Section A

Question 1

(a) Most candidates correctly stated a suitable constant to use for **Task 1**. Common errors seen for the value included lists of values rather than a single value and incorrectly including units as well as the value.

(b) Most candidates correctly stated a variable name and data type for the amount offered for the trade-in-value of an old car. The validation required was usually identified, better candidates also explained how their program ensured that the data entered was valid. For example, '*use of a conditional statement to check if the value input is greater than or equal to 10,000 and less than or equal to 100,000*' would gain all the marks available for validation.

(c) Generally, well answered by those candidates who explained the changes to the data structures and their algorithm that would be required in their program, as well as showing the code required to implement those changes.

(d) Algorithms were usually written in pseudocode or program code; a few flowcharts were seen. Most candidates correctly showed some the steps required to calculate each payment. Many candidates attempted to display the payments, those candidates who carefully followed the instructions in **Task 2** provided statements that included all the details required. Common errors included incorrect calculations and insufficiently detailed output.

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(e) Well answered by those candidates who explained how their program completed **Task 3**. Responses that only paraphrased **Task 3** from the scenario or only included code shown without explanation were not creditworthy. Common errors seen, included providing a redundant explanation of the calculation of 1 per cent discount that formed part of **Task 2** and not showing how their program identified the best offer to display first followed by displaying the other offer.

Section B

Question 2

(a) The full range of marks was awarded, many candidates correctly described the error that occurred if the value zero was input and provided a working correction. A few candidates gained no credit because they missed identifying other parts of the program as erroneous and tried to re-write that part of the pseudocode.

(b) The full range of marks was awarded. This part of the question proved more challenging for many candidates, who only partially identified the changes required.

Question 3

(a) Most candidates showed the skill of using a trace table. Candidates found the output the most challenging column to complete correctly and common errors seen were to incorrectly include inverted commas round the output, for example `"Pass"`, or include an `Average` of `40` as `"Fail"`.

(b) Generally, well answered, most candidates provided clear descriptions of the changes required to the flowchart. A common error seen was to not include an average mark of 60 per cent as a Merit.

Question 4

Most candidates could provide suitable examples of validation and verification. Providing correct explanations of why each type of check was needed proved to be more challenging for some candidates. Responses that gave vague explanations such as to ensure data is valid or correct were not creditworthy.

Question 5

(a) Many candidates gained good marks for this part of the question showing good understanding of the data types required.

(b)(i) Generally, well answered with most query-by-example grids completed as required.

(ii) This part of the question proved more challenging for many candidates. Most candidates correctly identified that the field needed to be shown, very few candidates correctly identified the criteria required for the column. An example of a correct criteria is = “walnut” or “beech”.