

COMPUTER SCIENCE

<p>Paper 2210/12 Paper 1</p>
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Key messages

This standard of candidate's work continues to improve for this syllabus. There is a continued move to provide questions where candidates have to apply their knowledge, rather than just show their ability to simply remember facts. There is strong evidence that this is producing candidates who are now exhibiting an improved understanding of many of the topics.

General comments

Candidates and centres are reminded that written papers are now scanned in and marked on computer screens by examiners. Consequently, if a candidate writes the answer to a question on an additional page, they must indicate very clearly to the examiner where their revised answer is to be found. Also, if answers have been crossed out, the new answer must be written very clearly, so that examiners can easily read the text and award candidates the appropriate mark.

Comments on specific questions

Question 1

- (a) Most candidates were able to tick the correct box for the response of Base-10.
- (b) Some candidates were able to provide all four correct values. Many candidates were able to provide a correct response for the first two values. Some candidates were able to provide a correct response for the last two values. The most common incorrect response was from candidates who provided a conversion to binary instead of a conversion to denary, as required by the question.
- (c) (i) Most candidates were able to tick the correct box for the correct binary response.
(ii) Most candidates were able to tick the correct box for the correct binary response.
- (d) (i) Many candidates were able to provide a correct example. The most common correct answer was in HTML colour code. Some candidates did not have a high enough level of accuracy in their response and gave more vague answers such as just HTML or in messages. Candidates are reminded to be technically accurate in their responses.
(ii) Many candidates were able to provide a correct example. The most common correct response was in assembly code.

Question 2

- (a) Most candidates were able to provide a suitable output device. The most common correct response was printer.
- (b) Most candidates were able to provide a suitable input device. The most common correct responses were touchscreen and microphone.

Question 3

- (a) Some candidates were able to provide the correct ticks in all rows. The most common incorrect responses were from candidates ticking Parallel Simplex in rows 1 and 4. It is possible that candidates have confused the operation of simplex data transmission with the operation of serial data transmission. It would be beneficial for candidates to have a clearer understanding of simplex and serial data transmission.
- (b) Many candidates were able to provide three benefits of the USB connection. Some candidates gave benefits of a USB memory device instead of a USB connection.

Question 4

Many candidates were able to provide the correct missing terms to complete the paragraph. The most common incorrect responses were from candidates who confused the operation of resistive and capacitive touch screens.

Question 5

- (a) Many candidates were able to provide three suitable methods. Some candidates stated that they could use a firewall. However, the question stated that the laptop would not be connected to any networks. Therefore this would be unnecessary. Candidates are reminded to apply the context they are given in a question to their response.
- (b) (i) Some candidates were able to provide three correct points about lossy compression. The most common correct responses were the removal of sounds and the reduction of colour depth. Some candidates gave the benefits or drawbacks of lossy compression instead of stating how the compression method would reduce the file size.
- (ii) Many candidates were able to provide a suitable drawback.
- (c) (i) Many candidates were able to provide a suitable reason. The most common correct answer was that it would maintain the quality.
- (ii) Some candidates were able to provide two suitable disadvantages. Many candidates did not provide a full disadvantage, stating that the file size would be larger, not stating why this would be a disadvantage. Candidates are reminded that when they are asked to provide advantages and disadvantages as an answer, they should look to do this in full by stating why their point is an advantage or a disadvantage in the given context.

Question 6

- (a) Many candidates were able to give a correct similarity. The most common correct response was that they both translate high-level languages into machine code.
- (b) Some candidates were able to provide two correct differences. Many candidates just gave several points of knowledge about the operation of either or both translators but did not relate these as differences between the two.
- (c) Most candidates were able to give another type of translator.

Question 7

Some candidates were able to provide correct ticks in all rows. The most common correct rows were rows 2, 3, and 4.

Question 8

Few candidates were able to provide an accurate and technical response about how the sensors and the microprocessor operate in the scenario given. Many candidates gave a generic response about the operation of a sensor and a microprocessor in a system but did not apply this to the context given in the question. Candidates are reminded that they are to apply any context given in a question to their response.

Question 9

- (a) Many candidates were able to give three correct examples of when an interrupt would be generated. Nearly all of the examples were related to the printing process. It would be beneficial for candidates to have a wider understanding of the use of interrupts beyond the printing process.
- (b) Many candidates gave responses that demonstrated an understanding that the computer would not operate efficiently in some way. The most common reason given being it would not be able to multitask.

Question 10

- (a) Most candidates were able to demonstrate an understanding that data would be encrypted.
- (b) Many candidates identified the Transport Layer Security (TLS) protocol.
- (c) Most candidates were able to identify two ways the website is secure.

Question 11

- (a) Many candidates were able to provide a correct logic circuit.
- (b) Many candidates were able to provide a correct truth table.
- (c) Many candidates were able to provide two further logic gates.

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Paper 2210/22
Paper 2

Key messages

Candidates who had previously worked through the pre-release material (Integrated Transport System) and who completed the tasks by producing their own programming code were able to demonstrate appropriate techniques for solving this problem.

Candidates who took care to ensure that they fully answered the questions that were asked, taking care to ensure their responses matched the context of the questions, scored higher marks than those who gave generic responses. Examples included: candidates who described how their program achieved certain tasks; candidates who supplied detailed annotations to their program code; candidates who took care to name or describe variables and arrays appropriately to match their purpose.

Candidates are advised to answer algorithm questions as stated in the question so that pseudocode questions are answered using pseudocode, program code questions are answered using program code and flowchart questions are answered using a flowchart.

Candidates are advised to make sure that any answers they provide are appropriate for the command word used in the question, such that questions beginning with explain will require more detail than those beginning with state. In addition, explain type questions usually require an explanation of how something was done, rather than a simple description of what was done.

General comments

Candidates demonstrated a good overall understanding of the requirements of the paper with very few questions left unanswered.

Candidates demonstrated a good understanding of how arrays could be used within the context of the given pre-release task.

Candidates are reminded that they should avoid using punctuation marks and spaces in variable and array names.

Comments on specific questions

Section A

Question 1

- (a) (i) Candidates who identified a relevant variable for **Task 2** and stated its use achieved both marks. Marks were lost if the variable name contained spaces or if the stated use was too vague.
- (ii) Candidates who identified an array that could be used for **Task 1**, along with some additional data, such as the data type, a description of its use, and an example of sample data, achieved most of the marks for this question. Candidates who were able to repeat this for more than one array achieved full marks.

- (b) Candidates who described how the input of codes for the different stages of the journey, which could include appropriate types of validation checks or the process their program would follow to check that the data entered was valid, achieved marks for this question. Candidates who described how to validate other data entry, such as account numbers, did not achieve marks.
- (c) The vast majority of candidates achieved some marks for this question, which required a section of code to be written to solve **Task 3**. Candidates were allowed to write their responses using pseudocode, program code, or a flowchart. Candidates who wrote their responses using code generally performed better. The full range of marks was seen for this question, with the vast majority of candidates checking the departure time, then calculating and applying a discount, if appropriate.
- (d) This question required an explanation of how the program from the pre-release material could be changed to give an additional discount after a specific passenger had made at least ten bookings. Candidates who only wrote code did not achieve any marks, however, some very good responses were seen, with the best ones having written explanations that were supported by examples of code, for clarification. This demonstrated that the candidate understood how they could achieve the specified task. The full range of marks was seen for this question, with many high-scoring responses.

Section B

Question 2

Most candidates achieved at least one mark here, to demonstrate that they could identify statements related to validation, verification, or neither of these.

Question 3

Candidates were expected to give examples of normal, extreme, and erroneous test data, along with a reason for why they had chosen the data, for a validation check with an input range of 1 to 100 inclusive. The vast majority of candidates correctly stated some or all of the examples of the test data. However, the reasons were not answered so well. One important reason for any test data is to see if the program will accept or reject it. This was often not stated in candidates' responses. Some candidates also incorrectly named a number of validation checks, which was not part of the question.

Question 4

- (a) The vast majority of candidates were able to identify and give corrections for at least one of the errors in the pseudocode algorithm. The full range of marks was seen for this question.
- (b) Some candidates achieved high marks for this question, with the best responses including a validation check, usually with a `WHILE` loop, after the value for `Operator` had been input. The full range of marks was seen for the question, but candidates who simply wrote out a corrected version of the given pseudocode algorithm, with no additional functionality, did not achieve any marks.

Question 5

The vast majority of candidates achieved some marks for this trace table question, with the full range of marks seen. Candidates are reminded to ensure that the content of the `OUTPUT` column should represent what would actually be seen on the computer screen if this were a running program.

Question 6

- (a) (i) The vast majority of candidates recognised that the field that could have a Boolean data type is `InStock`.
- (ii) The vast majority of candidates recognised that the field that should be used as a primary key is `ProductID`.

- (c) The majority of candidates achieved at least one mark for the query-by-example grid, with many achieving three or four marks. Some candidates lost marks because they had missed out one of the required fields, they had not completed the Table row, the sort method was missing or incorrect, or there was an error in the search criteria.