COMPUTER SCIENCE

Paper 0478/12
Paper 1

Key messages

This has been a successful examination series and candidates work continues to improve. 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

Some candidates provided the correct connections between the type of software and the description. Some candidates confused the two types of software and provided a mixed response or a completely incorrect response.

Some candidates only used a single line to connect a description to a piece of software, sometimes leaving one description without a connection. It would be helpful if candidates understood that some questions will indicate that one line is required as a connection and some questions will indicate that there may be more than one line that can be given as a connection. Candidates should thoroughly read the question to understand if one or multiple lines should be given from each box.

Question 2

(a) Many candidates answered this question well. Most candidates provided information about the virus scanner identifying and removing viruses. It would be encouraging to see candidates begin to provide understanding beyond this about the role of anti-virus software.

Some candidates demonstrated a misconception that anti-virus software will stop any viruses being downloaded. It would be helpful if candidates understood that this is not the case.

(b) Most candidates demonstrated a good level of knowledge for this question. The most common responses were the use of a firewall and to only download from trusted sources.

Some candidates repeated a solution already given in part **2(a)** about using anti-virus software to scan the computer. It would be helpful if candidates understood that if this has already been provided as a solution, no marks can be awarded for further elaboration when other alternatives have been requested.

Question 3

(a) and (b) Many candidates answered this question well. It was pleasing to see that candidates could use problem solving skills to find the correct answer and explain how they did this effectively.

Question 4

Some candidates answered this question well, but some provided a very generalised response. It would be helpful if candidates used the context and values provided in a question of this nature in their response. This will show a greater understanding about how that particular system will operate.

Question 5

(a) Many candidates answered this question well. Two common errors were not providing the full register values for the last register. Some candidates only gave 9 as the value, but the values for the whole register should have been provided, for example 09. It would be helpful if candidates understood that even if they are asked to convert the whole register, any 0 value should also be given.

Some candidates converted the value again for the first register. They should have provided the response 10, but treated this as a denary value and further converted it giving an answer of A. It would be helpful if candidates understood that the initial values from the conversion were hexadecimal values and not a denary value of 10.

(b) Many candidates provided a good response for this question. The most common responses were that it would make it easier to read and that fewer errors may be made.

Question 6

Many candidates answered this question well. It would be helpful if candidates understood that providing USB as a response cannot be awarded a mark as this is a method of data transmission. Candidates must provide a storage device, so must indicate that it is a USB storage device.

Some candidates described the storage itself and how it operates, rather than information about what it is used.

Question 7

(a), (b) and (c) Many candidates demonstrated excellent knowledge of both truth tables and logic circuits. It is pleasing to see that candidates are skilled in one of the logical fundamentals of Computer Science.

Question 8

(a) and (b) Many candidates provided a correct response for these questions, demonstrating an excellent level of knowledge of data transmission.

Question 9

Many candidates provided a correct answer for this question. It would be helpful if candidates clearly showed all the stages of their working in the work space. Some candidates scattered their working around, outside of the provided answer space into other answer spaces, which has the risk of being unseen by the examiner.

Question 10

(a) (i) and (ii) Most candidates provided a correct response and demonstrated an excellent level of understanding.

(b) This question appeared to be very challenging for candidates. Many candidates described the fetch execute cycle. It would be helpful if candidates understood that the stored program concept is a specific infrastructure for the central processing unit and not the fetch execute cycle. It would be encouraging to see candidates demonstrate a more confident level of knowledge of the stored program concept.

Question 11

(a) Many candidates answered this question well. Some candidates referred to making the downloading process easier. It would be helpful for candidates to understand that the downloading process would not change, it would be the download time that would be reduced.

Some candidates also referred to the download speed being reduced. It would be advisable for candidates to understand the difference between the speed of a download and the time it takes to download something. In this situation, the speed of the download would not be reduced, it would stay the same depending on the user's bandwidth.

(b) Some candidates provided a good level of knowledge of the compression process for an image. Some candidates described the compression process for sound. It would be helpful if candidates provided a response that described the context they are given in the question and not a generalised response about the compression of data.

Question 12

(a) This question appeared challenging for candidates. Many candidates described that the process was made easier linked regarding the fact that the data will be stored in an electronic database and it will be easier to see all the details and update them. This process would be just the same if the patients name was typed in, rather than the barcode scanned. Candidates did not consider this fact.

It would be helpful for candidates to focus on the process indicated in the question of using the barcode to access the records, making it quicker to scan and less likely to have an input error. The process beyond this would be the same as typing in the patient name.

(b) Many candidates answered this question well. It was pleasing to see the level of understanding provided about how a barcode scanner operates. Some candidates gave information about how barcode scanners are used, rather than describing how they operate.

Question 13

Many candidates provided a good level of knowledge about the functions of an operating system.

COMPUTER SCIENCE

Paper 0478/22
Paper 2

Key messages

Candidates who had completed the tasks for the pre-release (subject choices for students) 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 code from their solution for the task mentioned in the question and wrote that.

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

Questions asking for an explanation about a section of a program require the candidate to explain what this part of the program does as well as quoting any programming code used.

When candidates complete trace tables, values in the cells should be easily readable. If candidates use pencil, then overwrite with pen, it is sometimes difficult for the examiner to decide which value is the one intended. Any incorrect values should be clearly crossed out.

General comments

Most candidates attempted all the question parts in ***Section A***. **Question 1**, parts **(c)** and **(d)** were the ones most frequently omitted. Nearly all candidates attempted all the questions in ***Section B***.

Comments on specific questions

Section A

Question 1

(a) (i) Most candidates chose an array as the data structure required. A common error was to incorrectly give a data type instead of the data structure requested. Identifier names chosen must not contain any space.

(ii) Most candidates provide correct information for a variable and a constant. Some candidates did not always choose suitable constants, often identifying a quantity that could change during the task, for example, `NumberOfPhysicsStudents` could change as the student choices were identified.

(b) Some candidates correctly explained the changes that would be required to the **Task 2** program if the group size increased. Changes included altering the values of variables and/or constants and changing how selection statements worked. Some candidates incorrectly provided program code without an explanation.

(c) Algorithms were usually written in pseudocode or program code, some flowcharts were seen. Most candidates correctly showed some of the steps required for **Task 1**. Some candidates incorrectly included some of the steps required for **Task 2**, for example, printing lists of student names for each subject, these steps could not be credited. If candidates use pseudocode any count controlled loops should have `FOR` and `NEXT`, so the statements inside the loop can be easily identified.

(d) Some candidates provided the programming statements required to calculate the total number of spare places in **Task 3** together with a written explanation of the purpose of each statement. The explanation asked for in the question concerned only part of **Task 3**. Some candidates incorrectly included an explanation about calculating the total number of unallocated student choices, this could not be credited.

Section B

Question 2

(a) Most candidates correctly identified one or two errors. A few candidates showed good understanding of the pseudocode by correctly identifying the problem with the variable name and the need to add `INPUT Number` before `ENDWHILE`. A common error was to suggest that the `WHILE` condition was incorrect.

(b) Some candidates realised that as well as introducing an upper bound, there was a change required to the value of the lower bound of the selection test, as the number 100 would now be included.

Question 3

Most candidates showed the skill of using a trace table. Some candidates provided a 'rough answer' in pencil and a final answer in ink; this is not recommended as extra values can be seen in the trace table. Candidates found the output the most challenging column to complete correctly and common errors seen were to incorrectly include quotation marks around the output or repeats of the output.

Question 4

Most candidates could provide at least one correct test data value. Many candidates found providing the reasons more challenging.

Question 5

Candidates found the explanation of the difference between the programming concepts **sequence** and **selection** challenging, with few candidates identifying that programming statements in a sequence were executed one after another whilst selection meant that the path through the program depends on the result of a question. Candidates were more successful in providing suitable examples of programming statements. Common errors included confusing sequence or selection with iteration.

Question 6

(a) Nearly all candidates identified some appropriate fields and could also provide a suitable data type and explanation. Many candidates provided excellent answers worth full marks.

(b) Nearly all candidates gave a correct explanation as to why none of the fields were suitable use as a primary key.

(c) Nearly all candidates correctly identified the fields required in the query-by-example grid. Most candidates correctly identified which fields to show. Many candidates provided suitable criteria to identify that only details of silver bracelets were required.