COMPUTER SCIENCE

| Paper 2210/12 |
| Paper 1 |

Key Messages

This is a reasonably new syllabus and the standard of candidates work was mostly very good. 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 a good 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 answers 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

Most candidates were able to accurately name three different security risks. Many candidates were able to describe why they were a risk, but some candidates did not provide clear detail in their answer for this section. These candidates were vague in their response and not specific in the detail. Candidates need to make sure they are specific in their answers, clearly demonstrating their understanding.

Some candidates did not give an accurate enough response for minimising the security risk, for example installing most software will not ensure the risk in minimised. The software needs to be run in order to minimise the risk.

Question 2

Many candidates gained high marks for this question. Some candidates confused common areas such as lossy and lossless compression.

Question 3

Many candidates were able to accurately order the process. Candidates had clearly read the question carefully and were able to construct an accurate flowchart as a result.

Question 4(a) (b) and (c)

In part **(a)** most candidates were able to demonstrate a high level on knowledge in data representation and logic. Some candidates made small errors but still gained later marks with follow through on their answers.

In part **(b)** some candidates were able to provide a correct response. Some candidates made an error in putting the two codes for the two different colours, rather than combining the codes to create the colour requested.

In part **(b)(ii)** many candidates gave a vague response and did not describe that HTML codes are combined to create different colours. Many candidates provided a minimum level answer, such as adding the colour black to blue. They did not add the Computer Science aspect, that different HTML codes are combined to do this. Candidates need to make sure they are thinking about the computer science aspect of the question in questions such as this one.

In part **(c)** many candidates did not recognise what information they needed to give. They provided conversions of the hex values to denary or binary, rather than stating what the code actually represents. Some candidates were too vague in stating what it represented, candidates need to be specific in their responses. In part **(c)(ii)** some candidates were able to state that MAC addresses are a unique identifier for a device on a network. Many candidates were not specific enough, stating that MAC addresses identified a device on a network, but not stating that the identification is unique.

Question 5(a) (b) and (c)

In part **(a)** most candidates gained 2 or 3 marks. Many candidates did not specify any type of sensor that might be used in the system. If the sensor is not specified, this is something they should look to identify in a question of this nature. Some candidates were very generic in their response, speaking of values being compared rather than using the context of the question, for example images being compared.

In part **(b)** some candidates gained a mark for working out the number of images, a smaller number then made an attempt at calculating the memory requirement for the system.

In part **(c)** many candidates showed some understanding of the issues, but many were too vague as they did not compare the two types of infrastructure. A surprising number of candidates suggested that fibre optic cable is cheaper than conventional broadband cable.

Question 6(a) (b) and (c)

In part **(a)** many candidates were able to identify that HTML is hypertext mark-up language, and that it is used to create webpages. Very few candidates demonstrated knowledge beyond this.

In part **(b)** most candidates could not give a specific description of these terms. The responses given were very vague and did not identify a convincing difference between the two terms. Most candidates gave a vague definition referring to the way the website looks.

In part **(c)** most candidates gained a mark by stating that the web browser displays webpages. Many candidates stated an incorrect response, that a web browser allows people to surf the internet. Candidates need to remember the internet is an infrastructure and is not the World Wide Web.

Question 7(a) and (b)

In part **(a)** some candidates correctly followed the instructions and gained the marks for a correct answer.

In part **(a)(ii)** some candidates gave a correct response but were too vague in their reason as to why. They just stated that the remainder was not 10, rather that demonstrating what they had calculated the remainder to be.

In part **(b)** most candidates were able to give the correct parity bits.

Question 8

This question proved very challenging to candidates and tested the depth of their knowledge in this area. Many were able to start off with a correct sequence, and many were able to end with a correct sequence, but most became a little lost with their sequence in the middle stages. Candidates need to make sure they are fully reading each stage and carefully considering what will come before that and appear after that.

Question 9(a) (b) and (c)

In part **(a)** many candidates gave a definition of RAM, ROM and SSD rather than relating it to the context of the question. Candidates need to make sure they use a context of a question in their answer, where provided, when appropriate.

In part **(b)** a surprising number of candidates did not consider where the input device would be placed and therefore gave a range of unsuitable input devices. They again needed to consider the context of the question.

In part **(c)** most candidates gained at least one mark. A number of candidates suggested that the SSD was more robust, without any explanation. Candidates need to make sure that they clarify statements they make with regard to things such as robustness, reliability and security.

COMPUTER SCIENCE

Paper 2210/13
Paper 1

Key Messages

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General Comments

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Comments on Specific Questions

Question 1 (a) and (b)

In part **(a)** many candidates were able to provide a suitable application for each sensor. Some candidates did not understand what is meant by an application and some candidates gave a vague description of a possible use. Candidates need to name a specific and clear application.

In part **(b)** most candidates were able to provide a correct order to complete the flow chart. Candidates need only write the number of the instruction in the flowchart box and not the instruction text itself.

Question 2 (a) and (b)

In part **(a)** most candidates were able to gain some marks for a description of how sensors and the microprocessor would be used. Some candidates missed naming the type of sensor that could be used. This would have gained further marks. Some candidates were not specific in their answer, merely talking about comparing values, but specifically which values. Candidates need to make sure they are specific to the question in their answer.

In part **(b)** many candidates were able to correctly identify the fault condition provided. Most were able to provide the correct parity bit, and many were able to provide the correct vales in the register and convert this to hexadecimal. Candidates need to make sure their answer is clear when providing hexadecimal and that it can be distinguished from any working.

Question 3 (a), (b) and (c)

In part **(a)** some candidates were able to recognise and select the correct address and contents. Candidate need to make sure they read the whole question before answering as some had not noted the correct memory location provided in the question. Some candidates were able to provide the correct contents of the second set of registers, but some candidates did not manage to recognise how a section of memory worked and could not provide a correct answer to the question.

In part **(b)** some candidates could provide three correct registers, but many could only provide one or two.

In part **(c)** many candidates demonstrated limited knowledge of the workings of the control unit. Most were vague in their description and needed specific detail about how the unit operates.

Question 4 (a), (b) and (c)

In part **(a)(i)** many candidates confused free software with freeware or shareware, providing an incorrect answer. In part **(a)(ii)** most candidates were able to pick up marks by describing areas that might be covered in ethics. Most candidates missed providing detail about ethics being used to regulate or govern the use of computers.

In part **(b)** many candidates did not identify that some statements could apply to both a firewall and a proxy server. Most ticked only one.

In part **(c)** many candidates did not consider the question thoroughly and realise that it was asking about accidental damage and not malicious damage. Many candidates wrote about malicious damage such as viruses. Some candidates could correctly identify some methods such as creating a back-up. Candidates need to understand a clearer distinction between what causes accidental damage and what causes malicious damage.

Question 5 (a) and (b)

In part **(a)** some candidate did not consider that the file size would be considerably large and provided an unsuitable device as a result. If candidates are to state a device that has a small storage capacity but can also have a much larger one, for example a USB, they need to make sure they state a suitable size for the USB device.

In part **(b)** many candidates were able to provide a correct calculation for the question.

Question 6

Many candidates were vague in their answer and were not able to provide specific detail about the comparison operation. When candidates answer questions about the operation of devices they need to provide specific and clear detail.

Question 7

Many candidates were able to provide a suitable output device. Some candidates were not specific enough in identifying a device, for example providing an answer of printer, but not stating which type of printer. This level of detail was important to the question.

Question 8

Most candidates were able to get some marks for this question. Many were not specific enough in their application, for example stating supermarket, rather than at a supermarket checkout. Candidates need to make sure they are providing a full and clear application.

Question 9 (a) and (b)

In part **(a)** most candidates were able to carry out a correct calculation for this question.

In part **(b)(i)** some candidates could provide a good level of detail about MP3 file compression. Many candidates gave a vague description of compression itself and could not gain any marks for this. In part **(b)(ii)** many candidates could provide the correct type of compression, but in part **(b)(iii)** many candidates provided the opposing compression method, for example lossless and did not provide a file format.

Question 10

Some candidates were able to provide the correct missing terms, many confused plain text and cypher text, or encryption key and encryption algorithm.

COMPUTER SCIENCE

Paper 2210/22
Paper 2

Key messages

Candidates who had completed the tasks in the pre-release material (monitoring of a baby's temperature) were able to provide answers for **Section A** that demonstrated a 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 wrote out the code from their solution to the task mentioned in the question.

Candidates should take care when declaring variables, constants and arrays to ensure that the identifier declared could be used in a program. Once declared, the same identifier name should be used throughout the answer. The use of spaces and punctuation marks, and minor alterations in name, was condoned this session, as it was the first November examination in the series.

General comments

This was the second session of examination for O Level Computer Science Paper 2, Problem-solving and Programming. Nearly all candidates attempted all the questions on the paper.

Comments on specific questions

Section A

Question 1

(a) (i) Many candidates correctly declared two variables with meaningful names and could state what the variables had been used for.

(ii) Few candidates declared two constants with meaningful names and appropriate values. The term 'constant' did not seem to be familiar to many candidates. For example, an answer that would have gained all of the marks available could read:

Constant 1 `LowTemperature = 36`
Use To test the lower end of the acceptable temperature range for the baby
Constant 2 `HighTemperature = 37.5`
Use To test the higher end of the acceptable temperature range for the baby

(b) Algorithms were seen written in pseudocode, program code or as a flowchart. Most candidates wrote an algorithm that allowed for entry and testing of a baby's temperature. Some candidates needed to ensure that messages were shown to be output.

(c) (i) Many candidates correctly described checking for a temperature range of greater than one degree; stronger responses also output a message clearly stating what had happened. Some candidates checked how many times the baby's temperature had been out of range and then output a message if the temperature was out of range at least twice. A few candidates incorrectly included Task 2, so could not be awarded any marks for this part of the explanation. Some candidates incorrectly wrote only pseudocode or programming code, thus not providing the explanation required. Candidates were not required to draw a flowchart.

(ii) Candidates with the strongest responses throughout included a valid comment about the efficiency of their design for Task 3. Creditworthy comments seen included using the results from Task 2.

Section B

Question 2

Many candidates located at least one error and suggested a suitable piece of corrected code. The errors on lines 4 and 5 were frequently identified, with stronger responses providing a working correction. The question asked the candidates to identify and correct each error; a few candidates either identified the error or corrected the error, but both actions were required to gain each mark.

Question 3

(a)   Candidates with stronger responses throughout showed the skill of using a trace table; some candidates correctly updated the variables, T1 and T2, only.

(b)   Candidates with stronger responses throughout correctly identified the purpose of the flowchart as converting a denary number to binary. A few candidates incorrectly quoted the answer of a check digit from a previous examination paper.

Question 4

Most candidates could identify at least one correct example of test data. Examples of normal and abnormal test data were usually correct. Some candidates' examples of extreme test data were incorrect. A correct example of extreme test data would be 0.5 or 2.0.

Question 5

Many candidates could identify `IF` as a conditional statement. Candidates with stronger responses throughout also identified `CASE`.

Question 6

(a) (i)   Most candidates correctly identified the correct data type for some of the fields. Candidates who did less well throughout, incorrectly used data types from programming rather than database management.

  (ii)   Most candidates correctly identified the field to choose for the primary key.

(b)   Many candidates correctly identified at least one suitable validation check. Candidates with stronger responses throughout identified four different checks; a few candidates incorrectly repeated a validation check.

(c)   Many candidates correctly identified the fields to include in the query-by-example grid; stronger responses identified those fields that were to be shown. A common error was to not include the table name.

COMPUTER SCIENCE

| Paper 2210/23 |
| Paper 2 |

Key messages

Candidates who had completed the tasks in the pre-release material (monitoring of the temperature in an apartment) were able to provide answers for **Section A** that demonstrated a 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 wrote out the code from their solution to the task mentioned in the question.

Candidates should take care when declaring variables, constants and arrays to ensure that the identifier declared could be used in a program. Once declared, the same identifier name should be used throughout the answer. The use of spaces and punctuation marks, and minor alterations in name, was condoned this session as it was the first November examination in the series.

General comments

This was the second session of examination for O Level Computer Science Paper 2, Problem-solving and Programming. Nearly all candidates attempted all the questions on the paper.

Comments on specific questions

Section A

Question 1

(a) (i) Most candidates correctly declared two variables with meaningful names and many candidates could state what the variables had been used for.

(ii) Some candidates declared two constants with meaningful names and appropriate values. The term 'constant' did not seem to be familiar to many candidates. For example, an answer that would have gained all of the marks available could read:

Constant 1 LowTemperature = 22
Use Lowest acceptable level of temperature in the apartment
Constant 2 HighTemperature = 24
Use Highest acceptable level of temperature in the apartment

(b) Algorithms were seen written in pseudocode, program code or as a flowchart. Most candidates wrote an algorithm that found the highest and lowest temperatures recorded and calculated the difference between them.

(c) (i) Many candidates correctly described counting how often the temperature in the apartment was out of range; stronger responses differentiated between too high and too low temperatures output messages, clearly stating what had happened. Some candidates incorrectly wrote only pseudocode or programming code, thus not providing the explanation required. Candidates were not required to draw a flowchart.

(ii) Candidates with the strongest responses throughout included a valid comment about the efficiency of their design for Task 3. Creditworthy comments seen included using the results from Task 2.

Section B

Question 2

Most candidates located at least one error and suggested a suitable piece of corrected code. The errors on lines 5 and 9 were frequently identified, with stronger responses providing a working correction. The question asked the candidates to identify and correct each error; a few candidates either identified the error or corrected the error, but both actions were required to gain each mark.

Question 3

(a)   Most candidates showed the skill of using a trace table; some candidates correctly updated the variables, T1 and T2, only.

(b)   Candidates with stronger responses throughout correctly identified the purpose of the pseudocode as converting a denary number to hexadecimal. The candidates with the strongest responses throughout correctly identified that the hexadecimal number would be output in reverse order.

Question 4

(a)   Candidates with stronger responses throughout correctly identified that the data was normal test data and explained why it was used.

(b)   Candidates with stronger responses throughout identified two data sets, with each set showing a different type of data. To answer this question, each set of data should have contained all data of the same type.

Question 5

(a)   Most candidates correctly identified the correct data type for some of the fields. Candidates who did less well throughout incorrectly used data types from programming rather than database management.

(b)   Most candidates correctly identified at least one suitable validation check. Candidates with stronger responses throughout identified four different checks; a few candidates incorrectly repeated a validation check.

(c)   Most candidates correctly identified some fields to include in the query-by-example grid; stronger responses identified those fields that were to be shown. A common error was to not include the table name.