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COMPUTER SCIENCE

Paper 0478/11
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 correctly link the correct statements for an Inkjet printer. Some candidates missed the link to the statement 'can print in colour' for laser printer. It would be beneficial for candidates to understand that laser printers can also print in colour.

(b) Most candidates were able to identify the correct type of printer.

(c) Some candidates were able to describe the process of a 3D cutter. Many candidates show limited understanding, but they were able to demonstrate understanding that it cuts on the x, y and z axis. It would be beneficial for candidates to have a greater understanding of the operation of a 3D cutter, such as the understanding that a laser is used to cut the material.

Question 2

(a) Most candidates were able to convert the binary to the correct denary value.

(b) Many candidates were able to show understanding of the benefits of using hexadecimal. Some candidates demonstrated a misconception that hexadecimal takes less storage space than binary. It would be beneficial if candidates understood that the hexadecimal will need to be converted to binary to be stored, so it will not save any storage space.

(c) Many candidates were able to provide the correct hexadecimal values.

Question 3

(a) Many candidates demonstrated understanding that it is a type of malware that logs key presses. It would be beneficial for candidates to develop a greater understanding of how it relays data to a third party and how that data is analysed to obtain personal data.

(b) Many candidates referred to the use of drop-down boxes as a way to protect against spyware. It would be good to see candidates show understanding that there are other methods that could be used to prevent their personal data and accounts being accessed, such as two-step verification.

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(c) Many candidates showed understanding that data is checked by the firewall in some way. It would be beneficial for candidates to demonstrate a greater level of detail about how this is done, such as the setting of criteria and checking the traffic against these criteria. Some candidates stated that it can block certain traffic, but without any reference as to how this occurs.

(d) Most candidates were able to provide two other methods of protection.

Question 4

(a) Most candidates were able to probe a suitable input device.

(b) Most candidates were able to provide a suitable output device.

(c) Many candidates were able to provide a suitable storage device. Some candidates demonstrated a misconception that RAM could be used to store the data in this context.

(d) Some candidates were able to provide a good level of detail about the process involved in using a QR code to obtain the data. Many candidates described the structure and appearance of the QR code; however, the question did not require this information. Candidates are reminded to make sure that they are reading the context of the question and making sure that their answer directly applies to it.

Question 5

(a) Many candidates were able to correctly describe the data transmission method.

(b) Many candidates identified the correct byte and provided a good level of detail about how they had arrived at their answer. The detail most commonly missed was a simple reference to the counting of the 1/0 values. Some candidates demonstrated a misunderstanding that they counted the number of bits, however the number of bits would remain the same each time.

Question 6

(a) (i) Some candidates were able to demonstrate understanding that the code will not need an interpreter to be run each time. It would be beneficial for candidates to have a greater understanding of the benefits of the use of a compiler in terms of the executable file it produces.

(ii) Some candidates were able to demonstrate understanding that it would not be possible to modify the source code. It would beneficial for candidates to have a greater understanding of the drawbacks of compiling code into an executable file.

(b) (i) Most candidates were able to show how the security of a website can be checked.

(ii) Many candidates were able to show understanding that certificates are used in some way and that the data is encrypted when sent. It would beneficial for candidates to have a greater and more accurate understanding of the process involved, including the exchanging and authenticating of certificates and how this is carried out between the browser and the webserver (not the website).

(c) Candidates demonstrated limited knowledge about the type of software. Many correctly stated that is normally free of charge, but had a mixed understanding about the sharing, copying and modifying of the software. It would be beneficial for candidates to have a clearer understanding about what can be done with the software when it has been obtained by the user.

(d) (i) Most candidates were able to correctly identify that the file size is reduced along with a suitable benefit of this.

(ii) Most candidates correctly identified lossless compression.

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Question 7

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

(b) Many candidates were able to provide the correct logic gate.

(c) Many candidates were able to provide the correct logic circuit. The most commonly missed aspect were the two NOT gates.

(d) Many candidates were able to identify suitable benefits. It would be beneficial for candidates to state a benefit, rather than a feature, of the sensor in this context. Some candidates gave responses such as it can measure the level of heat, rather than a benefit such as it can measure the heat level and can be used to instantly indicate when the level is too hot.

Question 8

Candidates showed limited understanding of the process of fetching an instruction to be processed. Some candidates had some understanding that the MAR and the MDR are used in this process, but lacked accuracy about how they are used. It would be beneficial for candidates to have an accurate understanding of how an instruction is fetched to be processed.

Question 9

(a) Many candidates demonstrated understanding of the meaning of structure in a webpage.

(b) Many candidates demonstrated understanding of how a webpage is displayed. Some candidates demonstrated a misconception that the IP address uses the DNS server to look up the webserver of the website.

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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

Many candidates were able to correctly identify which statements were True or False. The most common incorrect answer was the final statement given as True.

Question 2

Most candidates were able to provide at least three suitable components. Candidates are reminded to make sure that they are accurate when providing the name of a component. Some candidates provided responses that were not accurately named, for example memory register.

Question 3

(a) Few candidates were able to show understanding of what is meant by analogue data. It would be beneficial for candidates to understand that it is a continuous stream of data that is processed by humans.

(b) Many candidates gained a mark by providing an example of digital data, such as binary data. It would be beneficial for candidates to be able to describe what is meant by digital data also, understanding it to be discrete data.

Question 4

(a) Most candidates were able to provide the correct value.

(b) Many candidates were able to carry out the correct shift. Some candidates shifted in the wrong direction.

(c) Many candidates were able to identify the effect the shift had on the value. Some candidates merely stated the value changed; however, this did not provide enough detail about how the value had changed.

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Question 5

(a) It was pleasing to see the level of detail that many candidates provided about the process of lossy compression in this context. Some candidates referred to reducing the resolution of the image and removing colours that humans may not see. Candidates are reminded that they should apply the question to the context that they are provided.

(b) (i) Many candidates were able to provide a suitable benefit. Some candidates lacked detail in their response such as it makes the size smaller, and it uses less space. It would be beneficial for candidates to make sure they are providing enough detail about the benefits they provide.

(ii) Many candidates were able to provide a suitable drawback.

(c) (i) Candidates demonstrated limited understanding of MIDI files. Some provided reference to the MIDI interface, but the question required information about MIDI files. It would be beneficial for candidates to develop a greater understanding of a MIDI file, its contents and how they are created.

(ii) Many candidates were able to provide suitable benefits. Candidates are reminded that if they want to use 'cheaper' as a benefit, they must clarify what it is that they are stating is cheaper, such as cheaper to manufacture.

Question 6

Candidates demonstrated a good level of knowledge about the given touch screen technology. A common incorrect response was that candidates ticked that resistive technology uses the electrical properties of the human body.

Due to an issue with this question, careful consideration was given to its treatment in marking in order to ensure that no candidates were disadvantaged.

Question 7

(a) Candidates demonstrated limited understanding of the operation of a keyboard. Some candidates were able to show understanding that a when a key is pressed a result occurs such as the completion of a circuit, along with some understanding that a character set such as ASCII is used in the process. It would be beneficial for candidates to develop a greater understanding of the operation of a keyboard.

(b) Many candidates were able to provide at least two functions of a browser.

(c) Many candidates demonstrated a good level of understanding of https. A range of knowledge was seen from candidates which was pleasing to see.

Question 8

(a) Many candidates were able to provide a correct statement. The most common incorrect response from candidates was the use of NOR in place of XOR in the statement, some candidates had confused the two gates.

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

Question 9

(a) Candidates demonstrated a good level of knowledge about duplex data transmission. A common incorrect response was that duplex data transmission would automatically detect any errors in data.

(b) Most candidates correct identified parallel.

(c) Many candidates were able to provide at least one benefit and description of a USB connection. It was pleasing to see a range of benefits referred to by candidates. Some candidates referred to benefits of a USB storage device rather than a USB connection. It would be beneficial for candidates to understand the distinction between the two.

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Question 10

(a) Candidates demonstrated limited understanding of the process of check digit. Many candidates described the process of a check sum, rather than a check digit. It would be beneficial for candidates to understand the difference between the two, most importantly that a check digit is used to check data entry and not as a check for errors in data after transmission.

(b) Many candidates were able to identify and describe three different security methods that could be used. It would be beneficial for candidates to understand that anti-virus is not a suitable choice, as a virus is not commonly used to obtain personal data. It may cause the loss of any personal data stored on a computer, but it is not commonly used to collect that data.

Question 11

(a) Candidates are reminded to answer the question in terms of the context given. Many candidates gave a definition of each of the components, rather than providing understanding of how they would be used in the given context.

(b) Most candidates were able to provide two suitable reasons.

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COMPUTER SCIENCE

Paper 0478/13
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) (i) Most candidates were able to provide two suitable input devices.

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

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

(b) (i) Some candidates were able to recognise increasing the length of the key would be a suitable option. However, many candidates focused on adding another security method, such as a firewall. This did not provide a suitable response to the question, which required candidates to provide understanding of how the security of the actual encryption of the data could be improved.

(ii) Some candidates were able to provide the response of cypher text. It would be beneficial for candidates to know the accurate terms involved in the encryption of data. Some candidates did not provide a level of response that was of a high enough standard and gave answers such as encrypted text.

(iii) Many candidates were able to demonstrate knowledge of how both systems would operate. Most candidates described them in isolation, which was sufficient to gain marks, but it would be beneficial to see candidates provide a greater understanding about how the systems would be integrated to work together as a whole error detection system.

(c) (i) Many candidates were able to provide the correct binary values.

(ii) Many candidates were able to describe how the size of the file could be reduced. A range of knowledge about the process was seen from candidates, which was pleasing to see.

(d) Candidates demonstrated limited understanding of the operating of and LCD screen. Some candidates were able to refer to the display being made up of pixels and some referred to the notion that the screen is backlit. It would be beneficial for candidates to have a greater understanding about how light is shone through liquid crystals. Also, how they can be made solid or transparent and how colour filters are used to create the different colours required.

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Question 2

(a) Many candidates were able to provide the correct response for each statement.

(b) Many candidates were able to identify the correct example of high-level language. The most common incorrect response was the second example ticked that referred to mnemonic codes.

Question 3

Many candidates were able to identify the correct missing data transmission terms.

Question 4

(a) Many candidates were able to provide a correct logic circuit. The most common error was the inputs of the AND gate for A AND T being A AND NOT T.

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

(c) Some candidates were able to provide a fully correct response of how the system would operate. Some candidates provided a generic response to the question, rather than using the context provided in the question. Candidates are reminded that when context is provided in a question, their response would be specific to the context provided.

Question 5

Many candidates were able to provide the correct three parity bits.

Question 6

(a) Some candidates correct identified that this described free software. Some candidates confused this description with freeware.

(b) Some candidates correct identified that this described freeware. Some candidates confused this description with free software.

(c) Many candidates correctly identified this was a description of shareware.

(d) Many candidates correctly identified this was a description of plagiarism. Some candidates stated this was a description of copyright. It would be beneficial for candidates to understand the link between plagiarism and copyright, but that copyright is not the actual theft of intellectual property, but that it helps regulate it.

(e) Many candidates correctly identified this as copyright.

Question 7

(a) (i) Some candidates correct identified and described RAM. Some candidates inaccurately included both RAM and ROM. It would be beneficial for candidates to understand that it is only RAM that is used in this context.

(ii) Most candidates were able to provide at least one suitable component. Candidates are reminded to make sure that they are accurate when providing the name of a component. Some candidates provided responses that were not accurately named, for example memory register.

(b) Candidates showed limited understanding of the role of interrupts. It would be beneficial for candidates to develop a greater understanding of the use of interrupts.

Question 8

Many candidates were able to describe how the malicious software could have ended up on the computer. It was pleasing to see a range of responses from candidates about how this could have been done.

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COMPUTER SCIENCE

Paper 0478/21
Paper 2

Key messages

Successful candidates showed evidence of practical experience in designing, programming and testing solutions to the three tasks from the pre-release (stone slabs for patio) to provide answers for ***Section A*** that demonstrated problem-solving and programming skills.

Successful candidates declaring and using variables and arrays as part of a response ensured that the identifier declared could be used consistently in a program. Identifiers must not contain spaces or other punctuation. Once an identifier is declared or used it must remain the same throughout the response to the question. Candidates are advised to read through each written response to ensure that no changes or errors have been made.

Successful candidates showed practical experience of designing, setting up and querying a database table to provide accurate answers to the database question. Once a field has been assigned a data type, the data type must remain the same throughout the response to the question. Candidates are advised to read through each written response to ensure that no changes or errors have been made.

Successful candidates showed evidence of good examination technique by answering the question as set on the examination paper in the space provided for the answer or clearly signposting where the answer was to be found on the examination paper.

General comments

Nearly all candidates attempted all the questions on the paper. Questions about the pre-release were the most likely not to be attempted by weaker candidates.

Comments on specific questions

Section A

Question 1

(a) Many candidates correctly identified two variables with meaningful names, suitable data types and a description of the purpose in **Task 1**. Common errors included incorrectly putting spaces or punctuation in variable names or stating an incorrect data type.

(b) Better responses included descriptions about the use of arrays with matching indexes.

(c) Responses providing pseudocode or code for **Task 2** usually scored higher marks than responses providing a flowchart. A few candidates did not attempt this part of **Question 1**.

(d) Good responses provided an explanation of programming statements that were used for **Task 3**. Unlike **Question 1** part **(c)**, this response required an explanation of how the programming code used by the candidate would provide a solution. Better responses explained how the programming statements calculated the percentage waste required. Responses seen without an explanation were not creditworthy. A few candidates did not attempt this part of **Question 1**.

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(e) Better responses identified suitable validation checks. Some candidates need to understand more about the use of validation checks in a program. A few candidates did not attempt this part of **Question 1**.

Section B

Question 2

Most candidates achieved good marks.

Question 3

(a) Most candidates provided a creditworthy description. Better responses showed detailed descriptions that gained full marks.

(b) Some candidates described the required modification of the algorithm to allow for any number of values to be input. Some candidates need to understand more about modification of algorithms.

(c) Most candidates correctly rewrote the algorithm using a `FOR` loop. Better responses also managed the new loop counter correctly.

Question 4

(a) Most candidates correctly completed the columns for the variables and the OUTPUT in the trace table. The PassMarks columns were completed by candidates who traced the algorithm correctly.

(b) Most candidates correctly identified the purpose of the algorithm.

Question 5

(a) Most candidates identified suitable field names and provided examples of data. A common error seen was to provide a description of the field instead of an example of the data stored in that field.

(b) Most candidates identified a suitable field using the information provided to answer **part (a)** of the question.

(c) Completion of the query-by-example grid required good attention to detail and using the information provided to answer **part (a)** of the question. Common errors seen included incorrect sort terminology or incorrect criteria for selection of the fuel type.

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COMPUTER SCIENCE

Paper 0478/22
Paper 2

Key messages

Candidates who had previously worked through the pre-release material (Concrete Slabs) and who completed the tasks by producing their own programming code were able to demonstrate appropriate techniques for solving this problem. These candidates were able to provide answers for the questions in ***Section A*** that demonstrated the programs they had written, descriptions of how they had solved tasks, why they had used their chosen methods and how their program was altered between the tasks to achieve additional functionality.

Candidates who took care to ensure they answered the question that was asked generally scored higher marks. Examples included: candidates who described how their program achieved certain tasks, or who supplied detailed annotations to their code, rather than simply writing the code; and candidates who took care to name or describe variables, constants and arrays appropriately to match their purpose, within the context or task required by the question.

Candidates should take care to read questions thoroughly before answering them and make sure they respond in the manner required. For example, candidates should limit the length of any program code they write in the examination to match the question that is asked rather than writing out excessive code covering the whole pre-release material.

Candidates are advised to ensure that any flowcharts they construct make use of standard programming flowchart symbols and conventions, and that they are fully connected.

General comments

This was the tenth session of the examination for IGCSE Computer Science paper 2, Problem-solving and Programming. Very few questions were left unanswered and the overall performance on this paper was of a very good standard, with a generally good performance being maintained from previous series.

Comments on specific questions

Section A

Question 1

(a) (i) Most candidates scored some marks on this question. In general, candidates were able to name a whole range of variables and constants used in their programs, including relevant uses and data types. Their marks, however, would have been even higher, had candidates also stated that they had used arrays, variables or constants. An example of a correct answer for five marks is:

> A variable named ‘Colour’ of data type string is used to store the colour of the slab.
> A constant named ‘Pi’ of data type real is used to store the value of Pi, to calculate the area of the slab.

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(ii) Candidates scored very highly on this question. They were able to name a variable that could be used in **Task 3** of the pre-release materials, along with their appropriate data types and purposes. An example of a correct answer for three marks is:

Variable name	`ConcretePrice`
Data type	real
Purpose	to store the price of the grade of concrete

(b) This question required an explanation to show that candidates understood how their programs calculated the volume of the concrete slabs. Many fully and almost fully correct answers were seen. However, it is important to note that the focus of the question was on the volume of the actual slabs rather than the volume of concrete needed for a batch of slabs. An example of a correct answer for three marks is:

> The size and depth of each shape were used to calculate the volume. First the area of the shape was found, for example, using length x breadth for the rectangular slabs. Then the area was multiplied by the depth of the slab.

(c) This question permitted a degree of flexibility in candidates' responses as answers could be written using program code, pseudocode or flowcharts. Most candidates made a good attempt at a response, with a very high proportion of candidates achieving high marks.

Responses were seen in a variety of programming languages, as well as pseudocode and flowcharts. Many creative responses were seen with a range of approaches seen to tackling some of the problems to be solved, for example, rounding up the number of slabs needed to the next 20, to create batches of 20.

In general, responses written in program code or pseudocode covered the task more successfully than responses written as flowcharts, as they tended to be more detailed and included more of the steps required to solve the problem.

(d) This question required candidates to explain how their program was changed to give it more flexibility, as required in **Task 3**. As a change to previous similar questions, although explanations were required, candidates were also asked to include code to illustrate their answers. Many high scoring responses were seen, however, candidates who described what the program did or simply wrote code were unlikely to score many marks, because the question required an answer to say how the program achieved the task. For example, the task involves changing the program from a fixed basic price for the concrete to a variable price for the concrete. An appropriate answer for one of the marks, to cover this part of the task, would be, 'a user prompt is provided to allow the price of the concrete to be entered'.

Section B

Question 2

This question required candidates to identify a number of errors and suggest corrections in a piece of code. The vast majority of candidates managed to find and correct at least one of the errors, with many candidates scoring full or nearly full marks. The answers for four marks are:

`IF TotalTry > Number`	should be	`IF Guess > Number`
`IF Guess > Number`	should be	`IF Guess < Number`
`TotalTry ← Guess + 1`	should be	`TotalTry ← TotalTry + 1`
`UNTIL Guess <> Number`	should be	`UNTIL Guess = Number`

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Question 3

(a) Candidates generally scored well on this question with many achieving full or nearly full marks. Candidates should take care to ensure that the content of the OUTPUT column matches the syntax of the output as would be expected from the given flowchart. An example of a correct answer for four marks is:

Reject	Count	Length	OUTPUT
0	0		
	1	24.88	
1	2	25.01	
	3	24.98	
	4	25.00	
	5	25.05	
	6	24.99	
	7	24.97	
	8	25.04	
	9	25.19	
2	10	25.07	Batch rejected

(b) (i) This question required candidates to give a correction to the flowchart that would change the limits of the lengths of rope tested to only reject those that were too short. Some candidates correctly gave the correct test that would be required. An example of a correct response is:

Change the test in the decision box (after the `Length` has been input) to

```
Is Length > 24.9?
```

(ii) This question proved a little more difficult and required candidates to explain how the algorithm could be made more efficient and effective when rejecting batches. Correct answers were based around the algorithm immediately terminating, with the batch rejected, once the rejection limit of two ropes was reached; rather than continuing to test the remaining ropes in the batch. A small number of candidates achieved some marks here.

Question 4

This question required candidates to match validation checks with their correct descriptions. The vast majority of candidates scored some marks here, with many achieving full marks.

Question 5

Candidates were required to explain how totalling and counting could be used in a given context, in which some variables: `Total` and `BasketCount` had been given. It was therefore important that the explanations given were in the context of the scenario rather than generic, and that the given variables appeared in any program statements. A large number of candidates achieved some marks with a small number achieving full or nearly full marks. An example answer for four marks is:

In totalling, the weight of each basket is added to the total weight as each weight is entered.

```
Total = Total + Weight
```

In counting, the number of baskets is incremented by 1 as each weight is entered.

```
BasketCount = BasketCount + 1
```

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Question 6

Candidates were required to explain why constants, variables and arrays are used in programming. Most candidates were able to do this, in part, and so achieved some of the marks; with some candidates scoring highly. An example answer for six marks is:

A constant cannot be changed during the execution of a program.

A variable can be changed during the execution of a program.

An array is a list of items of the same data type stored under a single name.

Question 7

(a) Most candidates were able to explain that the data in the 'Item number' field was not unique, so it could not be a key field.

(b) This question required candidates to identify some errors in a given query-by-example and then provide a corrected version. Most candidates scored some marks, with many candidates gaining full or nearly full marks. Candidates generally recognised that the fields that would be shown in the given grid were incorrect: 'Order number' and 'Amount' would be shown instead of 'Item number' and 'Order number'. Some candidates went on to explain why the criteria in the Status field was incorrect, as it would also display items that were 'cancelled', rather than those that were 'in progress' or 'not started'.

An example of the correct grid is shown, which, when added to the marks for the explanation, would give a total of five marks:

Field:	Item number	Order number	Status	
Table:	SALES	SALES	SALES	
Sort:				
Show:	☑	☑	☐	☐
Criteria:			Like 'Not started'	
or:			Like 'In progress'	

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COMPUTER SCIENCE

Paper 0478/23
Paper 2

Key messages

Successful candidates showed evidence of practical experience in designing, programming and testing solutions to the three tasks from the pre-release (wall tiling) to provide answers for ***Section A*** that demonstrated problem-solving and programming skills. Candidates need to read each question carefully and answer the question as set on the paper as a question may only require a response that is a partial solution or an extension to a task set out in the pre-release material.

Successful candidates declaring and using variables and arrays as part of a response ensured that the identifier declared could be used consistently in a program. Identifiers must not contain spaces or other punctuation. Once an identifier is declared or used it must remain the same throughout the response to the question. Candidates are advised to read through each written response to ensure that no changes or errors have been made.

Successful candidates showed understanding of programming techniques including use of subroutines, selection and iteration.

Successful candidates showed evidence of good examination technique by answering the question as set on the examination paper in the space provided for the answer or clearly signposting where the answer was to be found on the examination paper.

General comments

Nearly all candidates attempted all the questions on the paper.

Comments on specific questions

Section A

Question 1

(a) Many candidates correctly identified two arrays with meaningful names, suitable data types and a description of the use in **Task 1**. Common errors included incorrectly putting spaces in array names.

(b) Most candidates correctly named one variable, identified a suitable data type and stated the purpose of its use in **Task 2**. Common errors included incorrectly putting spaces in the variable name or stating an incorrect data type. Many candidates also explained why a variable was required.

(c) Responses providing pseudocode or code for the second part of **Task 1** usually scored higher marks than responses providing a flowchart. Many responses seen incorrectly included more than required by the question as they covered the whole of **Task 1**.

(d) Better responses provided an explanation of programming statements that were used to extend **Task 1** to complete **Task 2**. Unlike **Question 1** part **(c)**, this response required an explanation of how the programming code used by the candidate would provide a solution. Responses seen without an explanation were not creditworthy.

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(e) Better responses correctly explained the validation techniques required for the **Task 3** percentage input. A common error was to provide a description of **Task 3** instead of the validation techniques.

Section B

Question 2

The full range of marks was seen. Some candidates need to understand more about the use of subroutines in a program.

Question 3

Most candidates named three types of loop structure used in pseudocode.

Question 4

(a) Many candidates correctly named the type of statement.

(b) Better responses showed a correctly rewritten algorithm using a CASE statement. Some candidates need to understand more about the structure of a CASE statement.

Question 5

(a) Most candidates correctly completed some columns for the variables in the trace table. Some candidates need to understand the purpose of the OUTPUT column in a trace table.

(b) Some candidates correctly identified the function of this algorithm.

Question 6

Nearly all candidates drew and described at least two flowchart symbols.

Question 7

(a) Most candidates correctly stated the number of fields and records.

(b) Many candidates realised that none of the fields given were suitable to use as a primary key.

(c) Completion of the query-by-example grid required good attention to detail and using the information provided in the question. Common errors seen included incorrect sort terminology or incorrect criteria for selection of the test score.

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