COMPUTER SCIENCE

Paper 0478/11
Computer Systems

Key messages

Candidates need to show a greater use of technical terminology in their responses. Candidates will also need to note the key terms given in a question. They must structure their response using these. They must also use the given context in their responses.

General comments

If a candidate writes their response to a question on an additional page, they must indicate very clearly on the script where their response is to be found. If answers are crossed out, any new answer must be written very clearly, so that the text can be easily read.

Comments on specific questions

Question 1

(a) Most candidates ticked the correct answer.

(b) (i) Many candidates were able to give two correct types of compression. Some candidates gave examples of file types or formats, for example JPEG, rather than types of compression.

(ii) Many candidates were able to give three benefits of the compression. The most common correct answers were based on it being transmitted in a faster time and taking less storage space.

Question 2

(a) Many candidates were able to give two suitable input devices. Some candidates gave generic input devices that would not feasibly be built into a smart phone, for example a mouse.

(b) Many candidates were able to give two suitable output devices. Some candidates gave generic output devices that would not feasibly be built into a smart phone, for example a printer.

(c) (i) Some candidates were able to explain the purpose of the secondary storage. Some candidates seemed to have a misconception that secondary storage is only used when the primary storage in the smart phone is full.

(ii) Many candidates were able to give a suitable secondary storage device with a strong justification. The most common incorrect answer given was a hard disk drive (HDD). This would not be the most suitable type of storage.

Question 3

(a) Many candidates were able to give another character set that could be used.

(b) (i) and (ii) Many candidates were able to give the correct binary and hexadecimal conversions.

(c) (i) and (ii) Many candidates were able to give the correct denary and hexadecimal conversions.

(iii) Many candidates were able to give the correct binary number after the logical shift had been performed.

(d) Many candidates were able to correct add together the two binary values. Candidates are reminded that their working should be shown as binary addition. Candidates who converted each binary number to denary, added them and then converted the result to binary did not show their working in the binary addition.

Question 4

(a) Many candidates were able to correct describe the structure of a data packet. Some candidates just listed content of the data packet that would appear in the packet header instead of describing the structure of the data packet.

(b) (i) Some candidates were able to explain why the company chose parallel full-duplex data transmission. The most common reasons given were based upon data being transmitted in a faster time. Some candidates focused on describing how data is transmitted using parallel full-duplex, instead of explaining why the company would choose that method.

(ii) Some candidates were able to give drawbacks of using parallel full-duplex. The most common drawbacks given were based on an increased rate in errors.

(iii) Many candidates were able to give an alternative data transmission method that could be used.

Question 5

(a) Most candidates were able to give two correct registers.

(b) Few candidates were able to accurately describe what happens at the decode stage of the fetch-execute cycle. Many candidates instead described the execute stage of the cycle. Candidates need to have a better understanding of what happens at each stage of the FDE cycle.

(c) Most candidates were able to give a correct register.

(d) Many candidates were able to circle the correct buses. The most common incorrect answers given were central and execute.

(e) Many candidates were able to highlight that the change would increase the performance of the CPU. Few candidates were able to give a technically correct reason why this was the case.

Question 6

(a) Some candidates were able to state what is meant by an embedded system. The most common correct answers were based upon it being a system that has a dedicated function.

(b) Many candidates were able to give the correct translator.

(c) Many candidates suggested that hexadecimal could be used.

(d) A minority of candidates gave a benefit to the programmer of using assembly language to write the program. Candidates need to have a greater understanding of when assembly language code is beneficial in its use.

(e) Many candidates just listed features of an IDE. Few candidates expanded on this to describe how these features could help the programmer.

Question 7

(a) (i) Most candidates were able to tick the correct option. The most common incorrect answer given was ‘handling interrupts’.

(ii) Some candidates were able to identify and describe another function of the operating system. Many were able to identify another function, but few were able to expand this to describe the purpose of the function.

(b) A minority of candidates were able to identify that firmware is the name for the instructions that allow the operating system to run.

Question 8

Very few candidates were able to draw a representation of how blockchain is used in a digital transaction. Candidates need to have a better understanding of this process.

Question 9

(a) Many candidates were able to complete the paragraph with the correct terms.

(b) Few candidates were able to identify that the ability described was machine learning.

COMPUTER SCIENCE

Paper 0478/12
Computer Systems

Key messages

Candidates need to show a greater use of technical terminology in their responses. Candidates will also need to note the key terms given in a question. They must structure their response using these. They must also use the given context in their responses.

General comments

If a candidate writes their response to a question on an additional page, they must indicate very clearly on the script where their response is to be found. If answers are crossed out, any new answer must be written very clearly, so that the text can be easily read.

Comments on specific questions

Question 1

(a) Many candidates were able to state what is meant by software. The most common responses included reference to it being the intangible parts of a computer system.

(b) Many candidates were able to tick the correct option. The most common incorrect answer given was spreadsheet.

(c) Many candidates were able to identify the correct type of software.

Question 2

(a) Most candidates were able to identify the smallest unit of data. The most common incorrect answer given was nibble.

(b) Many candidates were able to give the correct number of nibbles. The most common incorrect answer given was 8.

(c) Many candidates were able to give one or two correct stages of working. Few candidates were able to give the correct answer.

(d) (i) Most candidates were able to state what is meant by file compression. Some candidates focused on a particular kind of compression rather that compression in general. For example, stating that it is when data is permanently removed from the file. This would not be true in all examples of file compression.

(ii) Many candidates were able to give a benefit of compressing the file. Some candidates incorrectly focused on benefits for transmission of the file rather than for the storage of the file.

Question 3

(a) (i) Many candidates were able to give one similarity. Some candidates provided vague responses that did not have the level of accuracy needed. For example, they are both used to represent data.

(ii) Many candidates were able to give two differences between binary and hexadecimal. Some candidates gave one difference split across the two sections. Candidates are reminded that if they are asked to provided differences between two options that they need to include refence to both options in the difference. For example, just stating 'hexadecimal uses letters' is not enough as it does not include reference to how binary is different to this.

(b) Many candidates were able to provide the correct binary conversions.

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

(d) (i) Many candidates were able to describe the logical shift that would be performed on the binary integer.

(ii) Many candidates were able to provide the correct effect on the binary integer. Some candidates gave a vague response that did not have the required level of accuracy. For example, stating that the value is increased or changed.

(e) Many candidates were able to give the correct name of the number system.

Question 4

(a) Most candidates identified two correct input devices. The most common correct answer was touchscreen. Some candidates gave generic input devices that were not suitable for the context given in the question, for example a mouse and a keyboard.

(b) Most candidates identified a correct output device. The most common correct answer was a display screen. Some candidates gave a generic output device that was not suitable for the context given in the question, for example a printer.

(c) Many candidates were able to explain the role of the ROM in the smart watch. Some candidates gave a description of what is meant by primary storage rather than explaining the role of the ROM.

(d) (i) Many candidates were able to show understanding of cloud storage. The main understanding shown is that the data is stored on servers that are in a remote location.

(ii) Some candidates were able to explain the benefits of the application using cloud storage. Many candidates focused on repeating understanding shown in **part (d)(i)**. For example, stating that a benefit is that the internet is used to access the data. Candidates need a greater understanding of a wider range of benefits of cloud storage.

(e) Many candidates were able to recognise that the smartwatch is an embedded system and gave the reason for this being that it has limited functionality.

Question 5

(a) Some candidates were able to describe how the system checked for errors. Many candidates focused their answer on describing how a barcode scanner operates rather than showing understanding of how the check digit is used to check for errors.

(b) (i) Many candidates were able to describe how data is sent using the serial simplex data transmission method.

(ii) Many candidates were able to give good reasons why serial simplex data transmission was used. The most common reason given was that the data would have fewer errors after transmission.

(iii) Most candidates were able to give two other error detection methods that could have been used.

Question 6

Some candidates were able to correctly complete the full table. The most common correct answers were MAR and data bus. Candidates appeared to have a common misconception about the purpose of the accumulator. Many candidates described it as carrying out calculations, however the accumulator does not do this.

Question 7

(a) Some candidates were able to correctly state what is meant by a URL. Many candidates gave a vague description about it being an address for the website. This lacked any technical detail about it being a text-based address.

(b) Many candidates were able to identify parts of a URL.

(c) Many candidates were able to identify the correct software.

(d) Some candidates were able to draw a correct and technical diagram to show the process of retrieving web pages. Some candidates showed a misconception that the request for the web page is sent from the DNS to the web server.

(e) Many candidates were able to complete the paragraph with the correct terms.

Question 8

(a) Most candidates were able to tick the correct option.

(b) Many candidates were able to circle the three correct components.

(c) Few candidates were able to explain how the robot vacuum could make use of machine learning. Many candidates just described what machine learning is rather than referring to how it could be used.

COMPUTER SCIENCE

Paper 0478/13
Computer Systems

Key messages

Candidates need to show a greater use of technical terminology in their responses. Candidates will also need to note the key terms given in a question. They must structure their response using these. They must also use the given context in their responses.

General comments

If a candidate writes their response to a question on an additional page, they must indicate very clearly on the script where their response is to be found. If answers are crossed out, any new answer must be written very clearly, so that the text can be easily read.

Comments on specific questions

Question 1

(a) Most candidates were able to tick the correct option. The most common incorrect answer was tebibyte.

(b) Most candidates were able to identify a correct example of primary storage and explain its purpose.

(c) (i) Most candidates were able to correctly convert the denary number to binary and showed their working.

(ii) Many candidates were able to convert the hexadecimal numbers to binary.

(d) Many candidates were able to correct add together the two binary values. Candidates are reminded that their working should be shown as binary addition. Candidates who convert the binary numbers to denary, add them, then convert the answer to binary did not show their working in the binary addition.

(e) Some candidates were able to correctly covert the two's complement binary value. Some candidates simply converted the binary value as though it was not a two's complement value.

Question 2

(a) Many candidates were able to correctly state the effect of the compression on the report file.

(b) Many candidates were able to give two suitable benefits of compressing the file before emailing it. Some candidates gave vague descriptions such as it would be faster to email. Candidates are reminded to make sure they use technical language in their responses.

(c) Some candidates were able to state why lossy was not suitable. Many candidates just provided a description of what lossy or lossless compression is rather than providing information about why lossy is not suitable.

(d) (i) Candidates generally understood that Unicode is an example of a character set.

(ii) Some candidates were able to give advantages for the use of Unicode. However, some candidates just gave a difference between the two, for example, they stated that Unicode uses more bits than ASCII but did not give the advantage of this.

(iii) Some candidates were able to give a suitable drawback. However, some candidates gave a difference such as Unicode using more bits, but did not state the disadvantage of this.

(e) (i) Many candidates were able to circle the correct three options. The most common incorrect answers were payload and trailer.

(ii) Most candidates were able to tick the correct option. The most common incorrect answer was packet transferring.

(iii) Many candidates were able to identify the correct hardware device. The most common incorrect answer given was internet service provider.

(f) (i) Many candidates were able to accurately explain how echo check is used to check for errors in the email data.

(ii) Few candidates were able to accurate state why the mismatch in the values would show an error had occurred. Many candidates simply repeated the question stating that mismatching values shows an error has occurred; they did not explain why.

(g) (i) Many candidates were able to give the reason why the email data was encrypted. Some candidates have a misconception that encrypting data stops the data from being stolen. Candidates need to understand that encrypting data does not stop the data being stolen; it will just be meaningless to the person who steals it.

(ii) Many candidates were able to give a similarity between the two types of encryption.

(iii) Some candidates were able to give two differences between the two types of encryption. Some candidates only referred to one type of encryption. For example, stating that symmetric encryption only uses one key, but did not continue to refer to how this compares to asymmetric encryption.

Question 3

(a) Many candidates were able to give two other correct suitable registers.

(b) Few candidates were able to draw an accurate and technical diagram of the decode stage of the FDE cycle. Many candidates drew either the fetch stage or the execute stage. Candidates need to have a greater understanding of what happens at the decode stage of the cycle.

Question 4

Many candidates were able to complete the table with the correct terms and descriptions.

Question 5

(a) Many candidates showed a good understanding of what is meant by an automated system.

(b) Many candidates were able to describe the role of the microprocessor in the system. Some candidates described the operation of the whole system, which was not necessary. The question only required the role of the microprocessor.

(c) Most candidates were able to give two correct benefits of the system to the farmer. A wide variety of benefits was seen from candidates.

(d) Few candidates were able to explain how the plough would make use of AI. Many candidates simply described what is meant by AI. Candidates need to have a better understanding of how AI is used in a variety of different contexts.

Question 6

(a) Many candidates were able to complete the paragraph with the correct missing terms.

(b) Many candidates were able to give three correct examples of the use of cookies.

Question 7

Few candidates were able to explain the purpose of the IDE. Most candidates simply listed features that can be found in an IDE.

COMPUTER SCIENCE

Paper 0478/21
Algorithms, Programming and Logic

Key messages

Candidates were able to demonstrate a good level of understanding of algorithms and programming. It would be beneficial to candidates to fully understand the published pseudocode within the syllabus as this is the basis for many of the questions within the paper.

General comments

Candidates using additional pages are reminded to clearly indicate the question for which they are providing a further response. In these, candidates need to clearly write their name and candidate number on any additional booklets.

Comments on specific questions

Question 1

Most candidates were able to correctly identify visual check.

Question 2

Most candidates were able to correctly identify the truth table.

Question 3

This question was answered correctly by most candidates. Many candidates did not connect the DIV operator to the correct operator type.

Question 4

Most candidates were able to identify the three correct stages of the life cycle.

Question 5

A minority of candidates identified the correct methods used to design and construct a solution to a problem. Many candidates identified one or two methods but did not describe the use of or the purpose of the method.

Question 6

(a) A minority of candidates provided a good response. Many candidates did not attempt the question. Many achieved the mark for completing the loop but found the comparison and the assignment challenging.

(b) A minority of candidates provided a good response to this question. Many candidates used program code for their response when the question asked for pseudocode.

(c) A minority of candidates used meaningful identifiers for the array and the variables. Many candidates used `Array` as the identifier for the array, which is not considered meaningful.

Question 7

(a) Many candidates produced the correct Boolean expression. Some candidates reversed the notation for `NOT X` with `X NOT`.

(b) This question was answered well by most candidates. Candidates were required to use the given logic circuit to complete the truth table.

Question 8

(a) Many candidates correctly completed the flowchart. Many candidates used incorrect symbols or did not complete flow lines with arrows. Flow lines should go to either a terminator or to a subroutine.

(b) Many candidates Incorrectly used program code or incorrect pseudocode, which did not match the syntax of the pseudocode in the syllabus.

(c) Most candidates incorrectly wrote about the use of the password in checking instead of explaining what data (in this case a password) is stored in a file.

Question 9

(a) Most candidates correctly identified the input error. Many candidates provided a correct and complete response.

(b) The majority of candidates identified the range of values between 35 and 38 inclusive.

(c) The majority of candidates completed the trace table correctly. Quotation marks on outputs are incorrect and once the stopping condition has been met, no further entries should be made in the trace table.

Question 10

(a) The majority of candidates identified the correct number of records in the database.

(b) (i) The majority of candidates identified the most suitable field for the primary key.

(ii) The majority of candidates stated the correct reason for choosing the field for the primary key.

(c) Most candidates provided at least one correct SQL output. Punctuation marks should not be in the output from an SQL statement.

(d) (i) Many candidates provided a correct response.

(ii) A minority of candidates identified another field that could have been used in the `WHERE` line of the SQL statement. Some candidates did not explain their choice or give any reasons.

Question 11

Candidates were asked to meet three requirements. Requirement 1 was to input each member's time and to use verification to ensure the data was input correctly. Requirement 2 was to sort the members time and name in ascending order of time, outputting the names and times of the members who finished first, second and third. Requirement 3 was to store all the members names who a who will receive a certificate and outputting the number of certificates.

Requirement 1 was attempted by most of the candidates but failed to use the arrays in the question. Most candidates only inputted data for one member and not the 200 as stated in the question. Most of the Candidates who used the arrays given did not use an index with the array or use a loop to input all the members times. Those who attempted the requirement did attempt double entry verification on the time with a few using double entry verification on the name as input; this was not a requirement of the question.

Requirements 2 was attempted by only a few candidates and only a few of this correctly used a bubble sort to sort the times and names. Some attempts at the bubble sort only used one loop. Some candidates used

the min/max method to sort the times but only did this once instead of three times. Some candidates added the SQL term `ASC` to their code for sorting.

Requirement 3 was attempted well by the candidates correctly using selection to identify members who achieved a time of under 240 seconds but did not store the names in the given array. Most candidates who attempted this requirement provided the correct output.

COMPUTER SCIENCE

Paper 0478/22
Algorithms, Programming and Logic

Key messages

Candidates need to carefully read the questions before answering them and their answers must refer to the given context.

Candidates who responded using the correct pseudocode syntax as defined in the syllabus, answered pseudocode questions accurately.

Candidates who answered questions appropriately in terms of the command word used were able to achieve the highest marks, for example: questions beginning with explain require more detail than those beginning with state. In addition, explain type questions usually require an explanation of how something is done, rather than a simple description of what is done.

General comments

Candidates demonstrated a good overall understanding of the requirements of most of the question paper.

Candidates are reminded that when answering the final programming question, they should read the scenario through to the end before they begin to write their solutions. Candidates do not need to declare variables and arrays unless it is stated in the scenario that they need to do this. Candidates should proceed straight to the writing of the program, concentrating their efforts on the given tasks. Candidates must, however, ensure that any variables and arrays defined or stated in the scenario are used and that they include any necessary initialisation.

Comments on specific questions

Question 1

The majority candidates were aware that structure diagrams are an alternative method of representing a solution to a problem.

Question 2

Most candidates understood that an `IF` statement is an example of a selection statement.

Question 3

(a) The majority of candidates were able to match each flowchart symbol with its correct purpose.

(b) Many candidates achieved some marks for their construction of a flowchart to meet the requirements stated in the question. A significant number of these candidates demonstrated a good understanding of flowchart symbols and flowchart structure.

Question 4

(a) Most candidates were able to identify and correct at least one of the errors in the given algorithm with a high proportion of these candidates identifying more than one. Candidates with a good understanding of pseudocode and the bubble sort algorithm were able to correct most of the errors.

(b) The majority of candidates found this question difficult. Some candidates were able to explain that the algorithm used a flag to stop the execution of the algorithm once it was in order, and/or the inner loop reduced its upper limit so that already sorted data was not checked again.

Question 5

(a) The majority of candidates were able to identify a stage in the program development life cycle other than analysis, for example: design, coding or testing.

(b) This question was answered well, with most candidates identifying abstraction and decomposition as occurring during analysis. Other correct points given included correct expansions on the meaning of abstraction or the inclusion of statements such as identification of the problem and/or identification of the requirements of the solution to the problem.

Question 6

Many candidates correctly identified a verification check such as visual check or double entry check. Some of these candidates expanded correctly to outline how their check would work. A significant number of candidates incorrectly named validation checks such as range check or presence check.

Question 7

(a) Candidates generally found it challenging to correctly complete the trace table. A significant number of candidates did correctly complete the first column with some correctly completing the whole trace table.

(b) A minority of candidates correctly identified the purpose of the algorithm.

(c) A significant number of candidates correctly identified the fact that the given input data could lead to an endless loop because the terminal condition for the loop (1) would never be reached.

Question 8

A significant number of candidates either named types of test data or just gave any values of test data that could be either normal or abnormal data. The question asked for test data that tested the whole number limit of 80, so boundary data was required. In this case, 80 is the highest acceptable value and 81 is the first rejected value. Some candidates did answer this question correctly in whole or in part.

Question 9

(a) Most candidates were able to correctly draw and connect the logic gates.

(b) There was a full range of marks for this question with most candidates achieving at least one mark.

Question 10

There were a mixed set of responses for this question with some very good algorithms provided. Candidates who had a good understanding of string handling, file handling and the pseudocode as presented in the syllabus, achieved the best marks. Some of these candidates achieved full or near full marks.

Question 11

(a) The majority of candidates correctly stated that the database table had 11 fields and 15 records. A small number of candidates reversed these two values incorrectly identifying the fields as records and vice versa.

(b) Most candidates understood that the data in the `Type` field was not unique for all records, so could not be the primary key.

(c) Candidates generally named appropriate fields that would contain each of the given types of data.

(d) The majority of candidates correctly wrote down the output of the given structured query language (SQL) statement. The most common error on this question was to include extra data in the response that was not required, such as additional punctuation. Candidates who reproduced the data from the database table to match the query, in the same order as it appeared in the table, achieved all three marks.

Question 12

Candidates were required to complete an extended program using pseudocode, Python, Java or VB.NET to meet a set of requirements given in a scenario. This scenario required a program to store the names and dimensions of up to 20 rooms for a house and calculate the area of each room and a range of other statistics that would then be printed.

There was a wide range of good responses, with most using either pseudocode or Python.

Candidates whose responses closely matched the requirements stated in the scenario, ensuring that all points were fully covered, achieved the highest marks.

The best responses included comments to explain what each part or sub part of the solution was doing and used input prompts and appropriate messages to accompany all outputs.

The best responses also correctly used the data structures given in the scenario in the way they were expected to be used, as stated in the scenario; in this case a one-dimensional (1D) array `Rooms()`, a two-dimensional (2D) array `Dimensions()` and a variable `Number` for the number of rooms.

Many candidates demonstrated good computational thinking skills by writing algorithms to cover all or most of the required tasks. Many candidates also spent time declaring arrays and variables, which was not required for this question. Marks are only given for responses that cover all the requirements, with the addition of comments and any messaging, as stated earlier.

It is also important to ensure that correct initialisation of variables is present, when necessary, to ensure that the candidate's solution would achieve the correct output. In this case, a maximum and minimum are required, to find the largest and smallest rooms, so those variables do need to be initialised appropriately. In addition, totalling routines are used to find the total area of the house to enable the average room size to be calculated. It is also important that variables used here are initialised before they are used.

COMPUTER SCIENCE

Paper 0478/23
Algorithms, Programming and Logic

Key messages

Candidates were able to demonstrate a good level of understanding of algorithms and programming. It would be beneficial to candidates to fully understand the published pseudocode within the syllabus as this is the basis for many of the questions within the paper.

General comments

Candidates using additional pages are reminded to clearly indicate the question for which they are providing a further response. In these, candidates need to clearly write their name and candidate number on any additional booklets.

Comments on specific questions

Question 1

Most candidates were able to correctly identify the correct check.

Question 2

Most candidates were able to correctly identify the correct method.

Question 3

Most candidates identified the correct symbols for all four logic gates.

Question 4

Most candidates correctly identified four or five of the database terms with a few identifying all six.

Question 5

A minority of candidates correctly identified the two other stages of the program development life cycle.

Question 6

(a) A significant number of candidates did not attempt this question. Many achieved the mark for the assignment of the variable. A few correctly identified the addition. A small number correctly identified the average calculation. Other candidates did not subtract one from `C` or did not include any parentheses.

(b) Only a few candidates achieved all the marks as this was a follow on from the previous question requiring the candidates to output the values from the algorithm. Incorrectly using program code was used by a few as this was a pseudocode question.

(c) Only a few candidates used meaningful identifiers for the array and the variables. Many candidates used `Array` as the identifier for the array, which is not meaningful.

Question 7

A minority of candidates achieved full credit for this question. Each type of test needed the name, the actual data and whether the data would be accepted or rejected. Boundary data test needs two pieces of data and an indication that one would be accepted, and one rejected.

Question 8

The truth table question was answered well by most candidates, achieving three or four marks.

Question 9

Most candidates correctly identified the errors. Many candidates identified the same error twice with the switching of the `Yes` and `No` on one of the decision boxes.

Question 10

(a) A minority of candidates achieved four or five marks for correctly entering the data and stating whether it would be accepted or rejected. Many candidates used quotation marks on the output, which is incorrect. When tracing an algorithm, each time a variable has a value assigned to it; this needs to be recorded in the trace table.

(b) Most candidates achieved one or two marks, with some scoring full marks. The password needed to be between 8 and 20 characters inclusive. Most candidates identified greater than 8 and less than 20.

Question 11

(a) Most candidates correctly identified at least one of the SQL statement outputs. Punctuation marks should not be in the output from an SQL statement.

(b) (i) Many candidates wrote down the correct SQL statement.

(ii) A minority of candidates identified another field that could have been used in the WHERE section of the SQL. This was an explain question and not just the use of SQL.

Question 12

Candidates were expected to meet three requirements. Requirement 1 was to input each member's picked weight and to use validation to ensure the data was sensible. Requirement 2 was to sort the members picked weight and name in descending order of weight. Requirement 3 was to output the names and the picked weights of the members who finished with the two heaviest weights and also to store the members names who will receive a certificate.

Requirement 1 was attempted by most of the candidates. Many candidates correctly used the arrays given in the question. Most candidates only inputted data for one member and not the number of members in the group. Most of the candidates who used the arrays given, did not use an index with the array or use a loop to input all the members times. Those who attempted the requirement applied some form of validation on the weight with a few using validation on the name as input, but this was not a requirement of the question.

Requirements 2 was attempted by a minority of candidates. Most of these candidates did not correctly use a bubble sort to sort the times and names. Some attempted the bubble sort but they only used one loop. Some candidates used the min/max method to sort the times but only did this once; it would have required two of these. Many candidates added the SQL term `ASC` to their code for sorting.

Requirement 3 was attempted well by most candidates. A minority chose the correct index of the two highest weights when outputting the names and picked weights of the members. Most candidates correctly identified members who achieved over 3 kg but did not store the names in the given array.