Cambridge Assessment International Education

# Cambridge IGCSE™

**COMPUTER SCIENCE** **0478/23**

Paper 2 **October/November 2021**

MARK SCHEME

Maximum Mark: 50

**Published**

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2021 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.



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**[Turn over**

**PUBLISHED**

## Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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| GENERIC MARKING PRINCIPLE 5:<br><br>Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen). |
| GENERIC MARKING PRINCIPLE 6:<br><br>Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind. |

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| Question | Answer | Marks |
|---|---|---|
| **Section A** | | |
| 1(a) | Constant name `MaxNoTables`<br>Value 20<br>Use Storing the maximum number of tables available for a session | **3** |
| 1(b) | Any **three** from:<br>MP1 Identifier / name of array used<br>MP2 Description of purpose of an identified array<br>MP3 Length of an identified array used<br>MP4 Type of data in an identified array<br>MP5 Explanation of number of arrays used, must be capable of storing all data required<br>MP6 Sample data for an identified array<br><br>**One mark**<br>MP7 Identifying more than one array<br><br>E.g. 3 sets of 4 arrays of twenty elements for each session, for example for lunch, `TableLunch` of type Boolean, `PassengerLunch`, `CabinLunch` and `DietReqLunch` all type string | **4** |
| 1(c) | Any **three** from:<br>MP1 Input the maximum number of tables available for a session<br>MP2 Input the maximum number of tables available for every session<br>MP3 Storing each value input in a variable / an array<br>MP4 Validation check<br>MP5 Change the constant used for number of tables to a variable<br>MP6 Using the value input instead of 20 for max value for loop counter etc | **3** |

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| Question | Answer | Marks |
|---|---|---|
| 1(d) | Any **six** from:<br>MP1 Input session<br>MP2 … with prompt<br>MP3 Validate input<br>MP4 Check number of tables available / check each table …<br>MP5 … for the session that has been input<br>MP6 If no tables available any session that has been input<br>MP7 … output suitable message<br><br>Sample<br>`REPEAT`<br>`  OUTPUT "Which session do you want to book a table?"`<br>`  INPUT Session`<br>`UNTIL Session >= 1 AND Session <= 3`<br>`IF TablesAvailable[Session] = 0`<br>`  THEN`<br>`  OUTPUT "No tables available "`<br>`ENDIF` | **6** |
| 1(e) | Explanation<br>Any **four** from:<br>MP1 Any changes required for the Array data types in Task 1<br>MP2 How the program displayed the options in Task 3<br>MP3 How the program selected the choice in Task 3<br>MP4 How the program dealt with incorrect choices in Task 3<br>MP5 How the program counted number of tables with vegetarian diners<br>MP6 How the program counted number of tables with vegan diners<br>MP7 How the program output number of tables with vegetarian/vegan diners<br><br>Programming statements should be used and must be explained. | **4** |

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| Question | Answer | Marks |
|---|---|---|
| **Section B** | | |
| 2(a) | Line 1 should be `Counter`<br>Line 2 should be `< 50`<br>Line 3 should be `RandUp(0,100) // RandUp(-1,100)`<br>Line 4 should be `Counter ← Counter + 1`<br>`1 Counter ← 0`<br>`2 WHILE Counter < 50 DO`<br>`3 NumRand[Counter} ← RandUp(0, 100)`<br>`4 Counter ← Counter + 1`<br>`5 ENDWHILE` | **4** |
| 2(b) | Any **three** from:<br>`FOR Counter ← 0 TO 49 // FOR Counter ← 1 TO 50`<br>`NumRand[Counter] ← RandUp(0,100) / RandUp(-1,100)`<br>`NEXT // NEXT Counter` | **3** |

| Question | Answer | Marks |
|---|---|---|
| 3(a)(i) | **one** mark for sample, **one** mark for reason **max four**<br>Normal Sample any password with at least 8 characters and one special character e.g. Password!<br>Reason to test that normal data is **accepted** and processed correctly<br><br>Erroneous Sample any value that would be rejected e.g. secret<br>Reason to test that erroneous data is **rejected** | **4** |
| 3(a)(ii) | Reason to test that Secret? which has 7 characters is rejected and Secret?? which has 8 characters is accepted<br><br>Boundary Sample 1 – Secret?<br>Boundary Sample 2 – Secret?? | **3** |

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| Question | Answer | Marks |
|---|---|---|
| 3(b) | Any **two** methods, **one** mark for method, **one** mark for description **max four**<br>E.g.<br>Asking the user to enter the password twice and comparing the values (1) only accepting the data if both entries are identical (1)<br>Displaying the password as it is entered (1) so the user can put right errors have been made as the password was typed (1) | **4** |

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| Question | Answer | Marks |
|---|---|---|
| 4 | **One** mark for each correct column | **5** |

| Counter | Pass | Mark | Help | OUTPUT |
|---|---|---|---|---|
| 0 | 0 | | | |
| 1 | 1 | 88 | | |
| 2 | | 24 | | |
| 3 | 2 | 60 | | |
| 4 | | 30 | | |
| 5 | 3 | 44 | | |
| 6 | | 17 | | |
| 7 | | 25 | | |
| 8 | | 22 | | |
| 9 | 4 | 54 | | |
| 10 | | 6 | | |
| | | 999 | 0.4 | Extra Help |

| Question | Answer | Marks |
|---|---|---|
| 5(a) | WEIGHT – Number, comparisons / calculations may be required<br>PRICE – Currency, the price is in dollars / money<br>CODE – Text, no calculations required, could be numbers or characters<br>STOCK – Number, comparisons / calculations may be required | **4** |

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>5(b)</td><td>
<table>
<tr><td>Field:</td><td>CATEGORY</td><td>MANUFACTURER</td><td>PRICE</td><td>CODE</td><td>WEIGHT</td></tr>
<tr><td>Table:</td><td>COMPUTER</td><td>COMPUTER</td><td>COMPUTER</td><td>COMPUTER</td><td>COMPUTER</td></tr>
<tr><td>Sort:</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Show:</td><td>☑</td><td>☑</td><td>☑</td><td>☑</td><td>☐</td></tr>
<tr><td>Criteria:</td><td></td><td></td><td></td><td></td><td>< 2.5</td></tr>
<tr><td>or:</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
One mark for correct rows Field and Table<br>One mark for correct Show row<br>One mark for correct Criteria row
</td><td>3</td></tr>
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