



Cambridge IGCSE™

COMPUTER SCIENCE**0478/21**

Paper 2

October/November 2020

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 2020 series for most Cambridge IGCSE™, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

This document consists of **6** printed pages.

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.

GENERIC MARKING PRINCIPLE 5:

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:

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.

Question	Answer	Marks
Section A		
1(a)	<p>For one array One mark for naming of an array with a suitable data type and one mark for its use</p> <p>Array yearsWithoutClaim Data type integer Use to store the % discount</p> <p>Many correct answers, this is an example only.</p>	3
1(b)	<p>For each validation check One mark for identification of a check and one mark for the reason max 4</p> <p>Check presence check Reason need to enter age to calculate price</p> <p>Check type check Reason need to check age is a positive integer</p> <p>Many correct answers, these are examples only.</p>	4
1(c)	<p>Any six from:</p> <p>MP1 Input with prompt if new customer MP2 Check age greater than or equal 26 MP3 Check age less than or equal 70 MP4 Check number of years without a claim greater than or equal to 2 ... MP5 ... discount 10% MP6 Otherwise discount 0% MP7 Calculate new price and value of extra discount MP8 Output new price and value of extra discount, with suitable message</p> <p>Sample answer</p> <pre>PRINT "Are you a new customer Y/N?" INPUT new discount ← 0 IF new = "Y" DO IF age >= 26 AND age <= 70 THEN IF yearsWithoutClaim >=2 THEN discount ← price * 0.1 price ← price * 0.9 ENDIF ENDIF ENDIF PRINT "New price", price PRINT "Extra discount for new customer", discount ENDIF</pre>	6

Question	Answer	Marks
1(d)(i)	<p>Explanation</p> <p>Any four from:</p> <p>MP1 Provide a prompt and input to check if additional driver required</p> <p>MP2 Check response with <code>IF/REPEAT/WHILE/CASE</code> statement for yes</p> <p>MP3 ... input age of additional driver</p> <p>MP4 ... Use of <code>IF / REPEAT</code> etc. to validate age</p> <p>MP5 ... use the age input to find / look up appropriate price increase</p> <p>MP6 ... description of how the price to pay now is calculated</p> <p>MP7 ... description of how the price to pay now is displayed including the use of a suitable message</p> <p>For no</p> <p>MP8 ... no output required or suitable message output</p> <p>Programming statements can be used but must be explained.</p>	4
1(d)(ii)	<p>Description</p> <p>Any three from:</p> <p>MP1 Use a variable (quotes) to keep a running total of the number of quotes provided</p> <p>MP2 Ask, using prompt with input, customers if they are going to purchase the insurance</p> <p>MP3 Use another variable (policies) to keep a running total of the number of insurances bought / not bought</p> <p>MP4 Use these to calculate the percentage policies/quotes*100</p>	3

Question	Answer	Marks
Section B		
2	<p>One mark for description of variable</p> <p>One mark for description of constant</p> <p>One mark for inclusion of an example variable</p> <p>One mark for inclusion of an example constant</p> <p>Example answer:</p> <p>A value that can change during the execution of a program</p> <p>A named value that cannot change during the execution of a program</p> <p>Variable example - using a counter for example <code>counter ← counter + 1</code></p> <p>Constant example – a static value that can be used for checking for example <code>< maxAge</code></p>	4

Question	Answer	Marks
3(a)	<p>Line 1/2/3/4/8/9</p> <p>Lines 5–11</p> <p>Line 9</p> <p>Line 8</p>	4

Question	Answer	Marks
3(b)	<p>One mark for error and correction</p> <p>Line 1 TotalWeight ← 0</p> <p>Line 10 move OUTPUT "Number of bags in the load is ", BagCount to end / after line 11</p> <p>Line 11 UNTIL TotalWeight > MaxWeight OR BagCount >= MaxBag</p> <p>Line 12 OUTPUT "Total weight of the load is ", TotalWeight</p>	4
3(c)	<p>Any four from:</p> <p>After line 11</p> <p>Divide TotalWeight by ... BagCount</p> <p>Assign a new variable AverageWeight ← TotalWeight / BagCount</p> <p>Output the result OUTPUT AverageWeight</p> <p>With a message "Average weight of a bag of firewood is "</p>	4

Question	Answer	Marks																																								
4(a)	<p>One mark for correct input columns (V, W, X, Y, Z)</p> <p>One mark for correct calculation column A</p> <p>One mark for correct calculation column B</p> <p>One mark for correct output column</p> <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>V</th> <th>W</th> <th>X</th> <th>Y</th> <th>Z</th> <th>A</th> <th>B</th> <th>OUTPUT</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>4</td> <td>6</td> <td>2</td> <td>1</td> <td>56</td> <td>1</td> <td>Valid</td> </tr> <tr> <td>9</td> <td>3</td> <td>2</td> <td>1</td> <td>6</td> <td>40</td> <td>7</td> <td>Invalid</td> </tr> <tr> <td>7</td> <td>6</td> <td>1</td> <td>5</td> <td>1</td> <td>61</td> <td>6</td> <td>Invalid</td> </tr> <tr> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	V	W	X	Y	Z	A	B	OUTPUT	5	4	6	2	1	56	1	Valid	9	3	2	1	6	40	7	Invalid	7	6	1	5	1	61	6	Invalid	0	0	0	0	0				4
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9	3	2	1	6	40	7	Invalid																																			
7	6	1	5	1	61	6	Invalid																																			
0	0	0	0	0																																						
4(b)	<ul style="list-style-type: none"> (Use first four digits input to) calculate a check digit Check if the check digit input is valid 	2																																								

Question	Answer	Marks
5(a)	6 fields 9 records	2
5(b)	<p>Either mark by row or by column but not both</p> <p>One each correct row or one mark for each correct column max two</p> <p>Koala3 Australia</p> <p>SkyKing Europe</p>	2

Question	Answer				Marks																														
5(c)	<table border="1" data-bbox="443 282 1313 707"> <tr> <td data-bbox="443 282 710 383">Field:</td> <td data-bbox="710 282 976 383">Airline name</td> <td data-bbox="976 282 1243 383">Number of countries</td> <td data-bbox="1243 282 1455 383">Head office</td> <td data-bbox="1455 282 1463 383"></td> </tr> <tr> <td data-bbox="443 383 710 450">Table:</td> <td data-bbox="710 383 976 450">AIRLINE</td> <td data-bbox="976 383 1243 450">AIRLINE</td> <td data-bbox="1243 383 1455 450">AIRLINE</td> <td data-bbox="1455 383 1463 450"></td> </tr> <tr> <td data-bbox="443 450 710 517">Sort:</td> <td data-bbox="710 450 976 517"></td> <td data-bbox="976 450 1243 517"></td> <td data-bbox="1243 450 1455 517"></td> <td data-bbox="1455 450 1463 517"></td> </tr> <tr> <td data-bbox="443 517 710 584">Show:</td> <td data-bbox="710 517 976 584"><input checked="" type="checkbox"/></td> <td data-bbox="976 517 1243 584"><input checked="" type="checkbox"/></td> <td data-bbox="1243 517 1455 584"><input type="checkbox"/></td> <td data-bbox="1455 517 1463 584"><input type="checkbox"/></td> </tr> <tr> <td data-bbox="443 584 710 651">Criteria:</td> <td data-bbox="710 584 976 651"></td> <td data-bbox="976 584 1243 651">> 4</td> <td data-bbox="1243 584 1455 651">="Asia"</td> <td data-bbox="1455 584 1463 651"></td> </tr> <tr> <td data-bbox="443 651 710 707">or:</td> <td data-bbox="710 651 976 707"></td> <td data-bbox="976 651 1243 707">> 4</td> <td data-bbox="1243 651 1455 707">="Africa"</td> <td data-bbox="1455 651 1463 707"></td> </tr> </table> <p data-bbox="304 741 1313 943"> one mark for correct fields and correct table names, must have the three columns required, ignore another column provided the show row is not ticked and there are no criteria set for that column one mark for correct show row one mark for correct number of countries criteria one mark for correct head office criteria </p>				Field:	Airline name	Number of countries	Head office		Table:	AIRLINE	AIRLINE	AIRLINE		Sort:					Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Criteria:		> 4	="Asia"		or:		> 4	="Africa"		4
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or:		> 4	="Africa"																																