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**COMPUTER SCIENCE**

**0478/23**

Paper 2

**May/June 2019**

MARK SCHEME

Maximum Mark: 50

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**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 May/June 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

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This syllabus is regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **8** 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
<b>Section A</b>		
1(a)	<p>4 marks for: Data Structure(s) <b>max 2</b> Arrays Variable(s) for // data entry such as Item Code // index / constant for minimum number of items</p> <p>Further description <b>max 3</b> Data type(s) one or more Use(s) one or more Name(s) one or more e.g. Item_Code, Description, Price, Stock Sample data for appropriate arrays e.g. 1234, Notepad, 0.050, 1000 // Sample data for variable or constant e.g. 10</p> <p>1 mark for: All four names and suitable data samples</p>	<b>5</b>
1(b)	<p>Keep a counter/number Add one every time a new item code is added</p> <p>or</p> <p>Keep a list of item codes used Using a loop check item codes is not already in the list before a new item code is added</p>	<b>2</b>
1(c)	<p>Check items in stock array ... with a value of 10 or less Display these values in a different way e.g. in red</p>	<b>3</b>

Question	Answer	Marks
1(d)	<p><b>Five</b> from:</p> <p>MP1 Enter the item code  MP2 ...and check if valid  MP3 Enter number to purchase and check if less than or equal to number in stock for that item number  MP4 Display error message(s) if needed  MP5 Calculate price to pay  MP6 Using the number to purchase calculate discount ...  MP7 Check for new customer AND \$50 spend/returning customer eligibility ...  MP8 ... application of discount(s) if available  MP9 Check order confirmed ...  MP10 ... update appropriate stock level</p> <p><b>Sample answer</b></p> <pre> REPEAT   PRINT "Enter Item Code"   INPUT ItemCode   Found ← False   Count ← 1   REPEAT     IF ItemCode = ItemList(Count) THEN Found ← True   ENDIF   Count ← Count + 1   UNTIL Found OR Count = NoItems UNTIL Found REPEAT   PRINT "Enter Number to purchase"   INPUT Number   UNTIL Number &gt; 0 and Number &lt;= Stock(ItemCode)   PriceToPay ← Number * Price (ItemCode)   IF Number &gt;= 10 AND Number &lt; 20 THEN PriceToPay ←   PriceToPay * 0.95 ENDIF   IF Number &gt;= 20 AND Number &lt; 50 THEN PriceToPay ←   PriceToPay * 0.9 ENDIF   IF Number &gt;= 50 AND Number &lt; 100 THEN PriceToPay ←   PriceToPay * 0.75 ENDIF   IF Number &gt;= 100 AND Number &lt; 500 THEN PriceToPay ←   PriceToPay * 0.65 ENDIF   IF Number &gt;= 500 THEN PriceToPay ← PriceToPay * 0.5 ENDIF PRINT "Enter Value of discount voucher, 0 if no voucher" INPUT Voucher PriceToPay ← PriceToPay - Voucher PRINT "Price to pay is ", PriceToPay PRINT "Order confirmed? Y/N" INPUT Confirm IF Confirm = "Y" THEN Stock(ItemCode) ← Stock(ItemCode) - Number ENDIF </pre>	5

Question	Answer	Marks
1(e)	<p>Explanation</p> <p><b>Five</b> from:</p> <p>MP1 Search item arrays</p> <p>MP2 For stock level = 0 ...</p> <p>MP3 ... list these as sold out</p> <p>MP4 Check stock level at end of day with original stock level//search items sold arrays</p> <p>MP5 ... if the same, display/store item code as not sold//if 0, display/store item code as not sold</p> <p>MP6 ... update largest value if greater than existing greatest value ... //use max function on items sold array ... //other method to find highest number sold ...</p> <p>MP7 ... display this item number with a suitable message</p> <p>All programming statements used must be explained.</p>	<b>5</b>

Question	Answer	Marks
<b>Section B</b>		
2(a)	<p>1 mark for each error identified + suggested correction</p> <p>Count ← 1 <b>should be</b> Count ← 0 <b>or</b> Count &gt;= 500 <b>should be</b> Count &gt; 500 AND <b>should be</b> OR Reject ← Reject - 1 <b>should be</b> Reject ← Reject + 1 Reject ← Reject/100 <b>should be</b> Reject ← Reject/5 <b>or</b> Reject * 100 / 500</p>	<b>4</b>
2(b)	<p>MP1 Add Accept ← 0 at start</p> <p>MP2 Add ELSE Accept ← Accept + 1 after THEN <u>AND</u> Over and Under defined/position described OR Add Accept ← Accept + 1 after THEN <u>AND</u> Replace IF statement with ...&lt;= Over AND ...&gt;= UNDER... /position described</p> <p>MP3 Add Accept ← Accept/5 after UNTIL AND correct loop/position described</p> <p>MP4 ADD IF Accept &lt; 50 THEN PRINT "Less than 50% accepted" at end</p> <pre> Accept ← 0 Count ← 1 // 0 Reject ← 0 Over ← 62 Under ← 58 REPEAT     INPUT ItemWeight     IF ItemWeight &gt; Over OR ItemWeight &lt; Under // IF ItemWeight &lt;= Over AND ItemWeight &gt;= Under         THEN             Reject ← Reject + 1         ELSE             Accept ← Accept + 1//ELSE not required     ENDIF     Count ← Count + 1 UNTIL Count &gt; 500 // &gt;= 500 Accept ← Accept / 5  IF Accept &lt; 50     THEN         PRINT "Less than 50% accepted" ENDIF </pre>	<b>4</b>

Question	Answer				Marks																																								
3	<table border="1"> <thead> <tr> <th>TreadReject</th> <th>Count</th> <th>Depth</th> <th>OUTPUT</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> <td></td> <td></td> </tr> <tr> <td></td> <td>2</td> <td>1.7</td> <td></td> </tr> <tr> <td></td> <td>3</td> <td>1.9</td> <td></td> </tr> <tr> <td>1</td> <td>4</td> <td>1.4</td> <td></td> </tr> <tr> <td></td> <td>5</td> <td>1.8</td> <td></td> </tr> <tr> <td></td> <td>6</td> <td>2.0</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>Car is potentially roadworthy</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				TreadReject	Count	Depth	OUTPUT	0	1				2	1.7			3	1.9		1	4	1.4			5	1.8			6	2.0					Car is potentially roadworthy									4
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5	<p>FOR ... TO ... NEXT fixed number of repetitions</p> <p>REPEAT ... UNTIL always executed // condition tested at end</p> <p>WHILE ... DO ... ENDWHILE may not be executed // condition tested at beginning</p>	6

Question	Answer	Marks																														
6(a)	Number is repeated/not unique	1																														
6(b)	<p><b>Three</b> from: Train number not displayed Departure time before 8:30 Criteria of =Y for Platform not required/incorrect All late trains will be shown/the condition should be on the line above</p> <p>4 marks, one mark for each correct column</p> <table border="1"> <tbody> <tr> <td>Field:</td> <td>Train Number</td> <td>Platform</td> <td>Departure Time</td> <td>Status</td> </tr> <tr> <td>Table:</td> <td>TRAIN</td> <td>TRAIN</td> <td>TRAIN</td> <td>TRAIN</td> </tr> <tr> <td>Sort:</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Show:</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Criteria:</td> <td></td> <td></td> <td>&gt; 08:30</td> <td>= "Late"</td> </tr> <tr> <td>or:</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Field:	Train Number	Platform	Departure Time	Status	Table:	TRAIN	TRAIN	TRAIN	TRAIN	Sort:					Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Criteria:			> 08:30	= "Late"	or:					7
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