

---

**COMPUTER SCIENCE****0984/22**

Paper 2

**May/June 2019**

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 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.

---

This document consists of **9** 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:</p> <p>Data Structure(s) <b>max 2</b></p> <p>Arrays</p> <p>Variable(s) for // data entry such as reserve price // index / constant for minimum number of items</p> <p>Further description <b>max 3</b></p> <p>Data type(s) one or more</p> <p>Use(s) one or more</p> <p>Name(s) one or more e.g. Item_Number, NumberBids, Description, Reserve Price</p> <p>Sample data for appropriate arrays e.g. 1234, 0, vase, 20.00 //</p> <p>Sample data for variable or constant e.g. 10</p> <p>1 mark for:</p> <p>At least four appropriate named arrays with sample data</p>	<b>5</b>
1(b)	<p>Keep a counter/number</p> <p>Add one every time a new item is added</p> <p>or</p> <p>Keep a list of numbers used</p> <p>Using a loop check number is not already in the list before a new item number is added</p>	<b>2</b>

Question	Answer	Marks
1(c)	<p><b>Five</b> from:</p> <p>MP1 Enter Buyer Number  MP2 Check if buyer number valid  MP3 Enter new bid  MP4 Check if new bid less than or equal to current highest bid ...  MP5 ... if so reject  MP6 ... Otherwise store the bid entered as new highest bid  MP7 Increase number of bids by one  MP8 Store Buyer Number</p> <p>Sample answer</p> <pre> REPEAT     PRINT "Enter Buyer Number"     INPUT BuyerNumber UNTIL BuyerNumber &gt;= BuyerLow and BuyerNumber &lt;= BuyerHigh REPEAT     PRINT "Enter Bid -99 to exit"     INPUT Bid     IF Bid &gt; HighestBid(item)         THEN             HighestBid(item) ← Bid             NumberBids(item) ← NumberBids(item) + 1         ENDIF UNTIL Bid &gt; HighestBid(item) OR Bid = -99 IF Bid &lt;&gt; -99     THEN         BuyerItem(item) ← BuyerNumber     ENDIF </pre> <p>There are many possible correct answers, this is an example only.</p>	5
1(d)	<p><b>Three</b> from:</p> <p>MP1 Using index number of item, to find if any bids for item exist  MP2 Using IF/UNTIL/WHILE (statement) to compare new bid with highest/latest bid recorded  MP3 Use an assignment (statement) to replace current highest bid, if new bid greater than current highest bid  MP4 ... else reject bid // using a (REPEAT/WHILE) loop ask for bid to be re-entered  MP5 If number of bids / highest bid = zero add bid (provided greater than zero)</p>	3

Question	Answer	Marks
1(e)	<p>Explanation of how the candidate's program performed the following.</p> <p><b>Five</b> from:</p> <p>MP1 Method to search item arrays MP2 Conditional statement used to check for the successful bids MP3 ... equal to / greater than reserve price MP4 Method used to calculate 10% percent of successful bid (for each item) MP5 ...and add to auction company total fee MP6 Method used to display total fee 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>Low ← Count <b>should be</b> Low ← Number            Number &gt; Low <b>should be</b> Number &lt; Low            UNTIL Count = 99 <b>should be</b> UNTIL Count &gt; 99 <b>or</b> UNTIL            Count = 100 <b>or</b> UNTIL Count &gt;= 100 // Count ← 1  <b>should be</b> Count ← 0            PRINT "Largest Number is ", Number <b>should be</b> PRINT            "Largest Number is ", High</p>	<b>4</b>
2(b)	<p>MP1 Add Total ← 0 // Total ← Number            MP2 Add Total ← Total + Number            MP3 Add PRINT "Total is ", Total            MP4 All positioning explained / seen</p> <pre> Count ← 1 INPUT Number High ← Number Low ← Number Total ← Number REPEAT   INPUT Number   Total ← Total + Number   IF Number &gt; High   THEN     High ← Number   ENDIF   IF Number &lt; Low   THEN     Low ← Number   ENDIF   Count ← Count + 1 UNTIL Count &gt; 99 PRINT "Largest Number is ", High PRINT "Smallest Number is ", Low PRINT "Total is ", Total           </pre>	<b>4</b>

Question	Answer					Marks
3	<b>Total</b>	<b>Count</b>	<b>Distinction</b>	<b>Mark</b>	<b>OUTPUT</b>	4
	0	0	0	50		
	50	1	0	70		
	120	2	0	65		
	185	3	0	30		
	215	4	0	95		
	310	5	1	50		
	360	6	1	55		
	415	7	1	85		
	500	8	2	65		
	565	9	2	35		
	600	10		–1	Number of Distinctions 2	
					Average Mark 60	
	<p>1 mark for Total and Count columns both correct.            1 mark for each correct column apart from Total and Count.            If no marks awarded allow 1 mark for initialisation of Total, Count and Distinction, set to zero.</p>					

Question	Answer			Marks
4	<b>Statements</b>	<b>Selection</b>	<b>Repetition</b>	4
	FOR A ← 1 TO 100 B ← B + 1 NEXT A		✓	
	CASE A OF 100: B ← A 200: C ← A ENDCASE	✓		
	IF A > 100 THEN B ← A ENDIF	✓		
	REPEAT A ← B * 10 UNTIL A > 100		✓	
1 mark for each correct row				

Question	Answer	Marks
5	<p><b>Validation</b> Two from:   automated checking   checking that data is reasonable / of a certain type   checking that data meets certain criteria</p> <p>Example 1 mark   range check // length check // type check // check digit etc.</p> <p><b>Verification</b> Two from:   checking that data has not changed...   ... during input to a computer   ... during transfer between computers / devices</p> <p>Example 1 mark   double entry // checking against original // visual check // use of checksum etc.</p>	6



Question	Answer	Marks																																																						
6(a)	Passengers	1																																																						
6(b)	<p>Explanation</p> <p><b>Three</b> from:</p> <p>Flight number not displayed            Passengers displayed when should not be            Departure time = not &gt;            "Freight and passengers" flight not excluded</p> <p>Revised QBE – answers shown are examples only            1 mark per bullet</p> <p>correct field and table names (either 3 or 4 columns) must include            Notes, Flight number and Departure time            correct show            correct time criteria for the candidate's QBE grid            use of criteria to select planes with passengers only</p> <table border="1"> <tr> <td>Field:</td> <td>Flight number</td> <td>Passengers</td> <td>Departure time</td> <td>Notes</td> </tr> <tr> <td>Table:</td> <td>FLIGHT</td> <td>FLIGHT</td> <td>FLIGHT</td> <td>FLIGHT</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 type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Criteria:</td> <td></td> <td>=Y</td> <td>&gt;10:00</td> <td>&lt;&gt; "Freight and passengers"</td> </tr> <tr> <td>or:</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>OR</p> <table border="1"> <tr> <td>Field:</td> <td>Flight number</td> <td>Departure time</td> <td>Notes</td> </tr> <tr> <td>Table:</td> <td>FLIGHT</td> <td>FLIGHT</td> <td>FLIGHT</td> </tr> <tr> <td>Sort:</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Show:</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>&gt;10:00</td> <td>= "Passengers only"</td> </tr> <tr> <td>or:</td> <td></td> <td>&gt;10:00</td> <td>= "Private passenger flight"</td> </tr> </table>	Field:	Flight number	Passengers	Departure time	Notes	Table:	FLIGHT	FLIGHT	FLIGHT	FLIGHT	Sort:					Show:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Criteria:		=Y	>10:00	<> "Freight and passengers"	or:					Field:	Flight number	Departure time	Notes	Table:	FLIGHT	FLIGHT	FLIGHT	Sort:				Show:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Criteria:		>10:00	= "Passengers only"	or:		>10:00	= "Private passenger flight"	7
Field:	Flight number	Passengers	Departure time	Notes																																																				
Table:	FLIGHT	FLIGHT	FLIGHT	FLIGHT																																																				
Sort:																																																								
Show:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																				
Criteria:		=Y	>10:00	<> "Freight and passengers"																																																				
or:																																																								
Field:	Flight number	Departure time	Notes																																																					
Table:	FLIGHT	FLIGHT	FLIGHT																																																					
Sort:																																																								
Show:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
Criteria:		>10:00	= "Passengers only"																																																					
or:		>10:00	= "Private passenger flight"																																																					