



**Cambridge Assessment International Education**  
Cambridge International General Certificate of Secondary Education

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**COMPUTER SCIENCE**

**0478/21**

Paper 2

**October/November 2017**

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.

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This document consists of **7** printed pages.

Question	Answer	Marks
1(a)(i)	<p>1 mark per bullet:</p> <ul style="list-style-type: none"> <li>• At least one array declaration</li> <li>• At least one array has an appropriate name</li> <li>• All arrays with appropriate names</li> </ul> <p>Many correct answers, they must be meaningful. These are examples only.</p> <pre>Array_2Seater[ ] Array_4Seater[ ] Array_Historic[ ]</pre>	<b>3</b>
1(a)(ii)	<p>1 mark per bullet:</p> <ul style="list-style-type: none"> <li>• Name of variable</li> <li>• Purpose of variable</li> <li>• Name of constant</li> <li>• Purpose of constant</li> </ul> <p>Many correct answers, they must be meaningful. These are examples only.</p> <p><b>Variable</b>    NumFlights                   to store the number of flights in a day</p> <p><b>Constant</b>    FlightCost2Seat30                   to store the cost of a 30 minute flight in a 2 seater plane</p>	<b>4</b>

Question	Answer	Marks
1(b)	<p>Any <b>five</b> from:</p> <ul style="list-style-type: none"> <li>• Prompt for plane</li> <li>• Input plane</li> <li>• Prompt for another input length of flight along with the input.</li> <li>• Attempt at calculation of maximum number of flights in a day</li> <li>• Using correct values for maximum number of flights (from calculation or otherwise)</li> <li>• Calculation/determination of cost of a single flight for selected plane and duration</li> <li>• Calculation of income that can be generated for one combination of plane and flight</li> <li>• Output of total possible income for one combination of plane and flight with message(s)</li> </ul> <p>Algorithm example:</p> <pre> OUTPUT "Please Enter Type of Plane" OUTPUT "1: 2 Seater" OUTPUT "2: 4 Seater" OUTPUT "3: Historic" INPUT PlaneType OUTPUT "Please Enter Length of Flight" INPUT FlightLength CASE FlightLength of   30: OUTPUT "Maximum number of flights is 10"   60: OUTPUT "Maximum number of flights is 6" OTHERWISE OUTPUT "Invalid length of flight" ENDCASE  CASE PlaneType of   1: Price30 ← 100; Price60 ← 150   2: Price30 ← 120; Price60 ← 200   3: Price30 ← 120; Price60 ← 500 OTHERWISE OUTPUT "Invalid type of plane" ENDCASE  CASE FlightLength of   30: OUTPUT "Total Possible Income is ", Price30 * 10   60: OUTPUT "Total Possible Income is ", Price60 * 6 ENDCASE </pre>	5
1(c)	<p>1 mark for each correct point related to the inputs for <b>Task 1</b></p> <ul style="list-style-type: none"> <li>• Description of how the program would validate the input</li> <li>• Description/identification of input(s)</li> <li>• Type of validation check</li> <li>• Checking inputs against stored data/maxima/correct data</li> <li>• Dry-running the program</li> <li>• Use of test data</li> <li>• Identification of types of test data</li> <li>• Example(s) of test data</li> </ul>	4

Question	Answer	Marks
1(d)	Any <b>four</b> from: <ul style="list-style-type: none"> <li>• Input timeslot</li> <li>• Check 3 types of plane</li> <li>• Methodology for checking time slot</li> <li>• Identify any planes available</li> <li>• Output plane(s) available</li> <li>• Output if no planes available</li> </ul>	<b>4</b>

Question	Answer	Marks
2	1 mark for each error identified plus suggested correction (the corrected lines must be written in full) <p>Line 4 <b>correct line</b> WHILE Number &lt;= 99 OR Number &gt; 1000</p> <p>Line 7 <b>correct line</b> Num[Index] = Number</p> <p>Line 9 <b>correct line</b> NEXT (Index)</p> <p>Line 10 <b>correct line</b> PRINT Count</p>	<b>4</b>

Question	Answer	Marks
3(a)	1 mark per bullet: <ul style="list-style-type: none"> <li>• Validation checks whether data to be entered is possible/sensible // computer check</li> <li>• Verification checks that data entered is the data that was intended to be entered // can be a human check // matches the source</li> </ul>	<b>2</b>
3(b)	1 mark for each valid point <p><b>Either</b></p> <ul style="list-style-type: none"> <li>• Double Entry // suitable practical example</li> <li>• the data will be entered twice</li> <li>• compared by the computer or by a human</li> <li>• if a discrepancy is found, the data entry operator is asked to re-enter the data</li> </ul> <p><b>Or</b></p> <ul style="list-style-type: none"> <li>• Visual Verification // suitable practical example</li> <li>• the data will be compared to the source 'document'</li> <li>• compared by a human</li> <li>• if a discrepancy is found, the data is re-entered</li> </ul>	<b>2</b>

Question	Answer	Marks
3(c)	1 mark for explanation and 1 mark for an expansion <ul style="list-style-type: none"> <li>Library routine is a list of instructions // block of code // subroutine</li> <li>... that is used often ...</li> <li>... which is given a name</li> <li>... and which can be called from other programs</li> <li>Library routines make writing programs easier and faster as the code is already written</li> <li>Library routines make program testing easier as the code has already been tested and debugged</li> </ul>	2

Question	Answer	Marks												
4(a)	1 mark for each correct line <table border="0" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th style="text-align: left;">Pseudocode description</th> <th style="text-align: left;">Pseudocode statement</th> </tr> </thead> <tbody> <tr> <td style="border: 1px solid black; padding: 5px;">A loop that will iterate at least once.</td> <td style="border: 1px solid black; padding: 5px;">FOR...TO...NEXT</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">A conditional statement to deal with many possible outcomes.</td> <td style="border: 1px solid black; padding: 5px;">IF...THEN...ELSE...ENDIF</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">A loop that will iterate a set number of times.</td> <td style="border: 1px solid black; padding: 5px;">WHILE...DO...ENDWHILE</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">A conditional statement with different outcomes for true and false.</td> <td style="border: 1px solid black; padding: 5px;">CASE...OF...OTHERWISE...ENDCASE</td> </tr> <tr> <td></td> <td style="border: 1px solid black; padding: 5px;">REPEAT...UNTIL</td> </tr> </tbody> </table>	Pseudocode description	Pseudocode statement	A loop that will iterate at least once.	FOR...TO...NEXT	A conditional statement to deal with many possible outcomes.	IF...THEN...ELSE...ENDIF	A loop that will iterate a set number of times.	WHILE...DO...ENDWHILE	A conditional statement with different outcomes for true and false.	CASE...OF...OTHERWISE...ENDCASE		REPEAT...UNTIL	4
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4(b)	1 mark per bullet: <ul style="list-style-type: none"> <li>Appropriate loop controls</li> <li>Read from array</li> <li>Print from array (the last two points can be in one statement)</li> </ul> Note reading and printing <b>MUST</b> be within the same loop <p>Example algorithm:</p> <pre> Count ← 0 WHILE Count &lt; 50 DO     OUTPUT Name[Count]     Count ← Count + 1 ENDWHILE                     </pre>	3												

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5(b)	<p>1 mark per bullet:</p> <ul style="list-style-type: none"> <li>• Sorting the names</li> <li>• Ascending order / A to Z / lowest to highest / Alphabetic order</li> </ul>	2																																																																																											

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6(a)	<p>1 mark for any <b>sensible appropriate</b> field name 1 mark for data type, purpose + example data</p> <p>Example 1: Field Name: SPECIESID Data Type: Alphanumeric Purpose: Primary key Example Data: SP06583</p> <p>Example 2: Field name: NUMBER Data Type: Integer Purpose: To record how many of that species there are at the park Example Data: 30</p>	2

Question	Answer					Marks	
6(b)						<b>4</b>	
	Field:	Species	Classification	Diet	Legs		
	Table:	LIVESTOCK	LIVESTOCK	LIVESTOCK	LIVESTOCK		
	Sort:	Ascending/ Descending					
	Show:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
	Criteria:		"Mammal"	"Herbivore"	4		
	or:						
(1 Mark)                      (1 Mark)                      (1 Mark)                      (1 Mark)							
1 mark per completely correct column.							