Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMPUTER SCIENCE **0478/21**

Paper 2 **October/November 2017**

MARK SCHEME

Maximum Mark: 50

Published

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Question	Answer	Marks

1(a)(i)	1 mark per bullet:
	
	• At least one array declaration
	• At least one array has an appropriate name
	
	• All arrays with appropriate names
	
	Many correct answers, they must be meaningful. These are examples only.
	
	`Array_2Seater[ ]`
	`Array_4Seater[ ]`
	`Array_Historic[ ]`
		3

1(a)(ii)	1 mark per bullet: • Name of variable • Purpose of variable • Name of constant • Purpose of constant Many correct answers, they must be meaningful. These are examples only. Variable `NumFlights` to store the number of flights in a day Constant `FlightCost2Seat30` to store the cost of a 30 minute flight in a 2 seater plane	**4**

Question	Answer	Marks

1(b)	Any **five** from:
	
	• Prompt for plane
	• Input plane
	• Prompt for another input length of flight along with the input.
	• Attempt at calculation of maximum number of flights in a day
	• Using correct values for maximum number of flights (from calculation or otherwise)
	• Calculation/determination of cost of a single flight for selected plane and duration
	• Calculation of income that can be generated for one combination of plane and flight
	• Output of total possible income for one combination of plane and flight with message(s)
	
	Algorithm example:
	
	`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`
		5

1(c)	1 mark for each correct point related to the inputs for **Task 1** • Description of how the program would validate the input • Description/identification of input(s) • Type of validation check • Checking inputs against stored data/maxima/correct data • Dry-running the program • Use of test data • Identification of types of test data • Example(s) of test data	**4**

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Question	Answer	Marks
1(d)	Any **four** from: • Input timeslot • Check 3 types of plane • Methodology for checking time slot • Identify any planes available • Output plane(s) available • Output if no planes available	**4**

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

Question	Answer	Marks
3(a)	1 mark per bullet: • Validation checks whether data to be entered is possible/sensible // computer check • Verification checks that data entered is the data that was intended to be entered // can be a human check // matches the source	**2**
3(b)	1 mark for each valid point **Either** • Double Entry // suitable practical example • the data will be entered twice • compared by the computer or by a human • if a discrepancy is found, the data entry operator is asked to re-enter the data **Or** • Visual Verification // suitable practical example • the data will be compared to the source 'document' • compared by a human • if a discrepancy is found, the data is re-entered	**2**

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Question	Answer	Marks
3(c)	1 mark for explanation and 1 mark for an expansion • Library routine is a list of instructions // block of code // subroutine • … that is used often … • … which is given a name • … and which can be called from other programs • Library routines make writing programs easier and faster as the code is already written • Library routines make program testing easier as the code has already been tested and debugged	**2**

Question	Answer	Marks
4(a)	1 mark for each correct line **Pseudocode description** / **Pseudocode statement** A loop that will iterate at least once. → REPEAT…UNTIL A conditional statement to deal with many possible outcomes. → CASE…OF…OTHERWISE…ENDCASE A loop that will iterate a set number of times. → FOR…TO…NEXT A conditional statement with different outcomes for true and false. → IF…THEN…ELSE…ENDIF WHILE…DO…ENDWHILE	**4**

4(b)	1 mark per bullet:
	
	• Appropriate loop controls
	• Read from array
	• Print from array (the last two points can be in one statement)
	
	Note reading and printing **MUST** be within the same loop
	
	Example algorithm:
	
	`Count ← 0`
	`WHILE Count < 50 DO`
	`  OUTPUT Name[Count]`
	`  Count ← Count + 1`
	`ENDWHILE`
		3

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>5(a)</td><td>
<table>
<tr><th>Flag</th><th>Count</th><th>Name[1]</th><th>Name[2]</th><th>Name[3]</th><th>Name[4]</th><th>Temp</th></tr>
<tr><td></td><td></td><td>Jamal</td><td>Amir</td><td>Eve</td><td>Tara</td><td></td></tr>
<tr><td>0</td><td>1</td><td>Amir</td><td>Jamal</td><td>Eve</td><td>Tara</td><td>Jamal</td></tr>
<tr><td>1</td><td>2</td><td>Amir</td><td>Jamal</td><td>Eve</td><td>Tara</td><td>Jamal</td></tr>
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(1 Mark) (1 Mark) (--------1 Mark--------) (--------1 Mark--------) (1 Mark)
</td><td>5</td></tr>
<tr><td>5(b)</td><td>1 mark per bullet:

• Sorting the names
• Ascending order / A to Z / lowest to highest / Alphabetic order</td><td>2</td></tr>
</table>

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>6(a)</td><td>1 mark for any sensible appropriate field name
1 mark for data type, purpose + example data

Example 1:
Field Name: SPECIESID
Data Type: Alphanumeric
Purpose: Primary key
Example Data: SP06583

Example 2:
Field name: NUMBER
Data Type: Integer
Purpose: To record how many of that species there are at the park
Example Data: 30</td><td>2</td></tr>
</table>

Question	Answer	Marks
6(b)		**4**

Field:	Species	Classification	Diet	Legs	
Table:	LIVESTOCK	LIVESTOCK	LIVESTOCK	LIVESTOCK	
Sort:	Ascending/ Descending				
Show:	☑	☐	☐	☐	☐
Criteria:		“Mammal”	“Herbivore”	4	
or:					
	(1 Mark)	(1 Mark)	(1 Mark)	(1 Mark)	

1 mark per completely correct column.