COMPUTER SCIENCE **0478/22**

Paper 2 **March 2017**

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.

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Question	Answer	Marks
1(a)(i)	Many correct answers, the identifier must be meaningful and appropriate size if present. These are examples only `ReactionTime [1:650]`, `ReactionTime [0:649]`, `ReactionTime [650]`, `ReactionTime[649]`, `ReactionTime[ ]`	1
1(a)(ii)	Many correct answers, the identifier must be the same as part 1(a)(i) including appropriate size if present. These are examples only `ReactionTime [1:50]`, `ReactionTime [0:49]`, `ReactionTime [50]`, `ReactionTime[49]`, `ReactionTime[ ]`	1
1(a)(iii)	Any **two** from: – can store multiple reaction times under a single identifier – reduces the number variables – arrays have an index which identifies each stored element – can use iteration to loop through an array – allows for more efficient programming – programs are easier to debug	2

1(b)	Any **three** from:
	
	– an effective loop to accept 650 records
	– prompt for **all three** inputs
	– within the loop reads **all three** INPUT values
	– storing input values in appropriate arrays
	
	Sample Answer.
	`FOR Counter ← 1 TO 650`
	`    OUTPUT ('Input House, Age and Reaction Time')`
	`    INPUT HouseArray [Counter], AgeArray [Counter],`
	`    ReactionTimeArray[Counter]`
	`NEXT`
		3

1(c)	1 mark for correct type of test data (max 3) …… 1 mark for appropriate example (max 3) <table><tr><td>Normal / Valid</td><td>12 / 13 / 14 / 15 / 16</td></tr><tr><td>Erroneous / Abnormal / Invalid</td><td>13.5 / Twelve / 9</td></tr><tr><td>Boundary (accepted) Boundary (rejected)</td><td>12 or 16 11 or 17</td></tr><tr><td>Extreme</td><td>12 or 16</td></tr></table>	6
1(d)	Any **five** from following explanations: – user input for House and Age – loop through the arrays – use selection statements to identity the elements that meet <u>both</u> criteria – maintain counter of elements (that met criteria of House and Age input) – maintain a sum of reaction times (that match criteria of House and Age input) – calculate the average from element counter and sum of reaction times – create appropriate output message – output message and average outside of loop	5

Question	Answer	Marks
1(e)	Any **two** from following explanations: – variable used to hold fastest time will have to initialised to a high value / variable used to hold **fastest** time will be given first record value – store array value in variable if reaction time less than current value in variable – store array value of age with the same index in a variable – Output age and fastest reaction time	**2**

Question	Answer	Marks
	Section B	

Question	Answer	Marks

2	1 mark for each error identified **with** effective corrective action
	
	`01 Num18 = 0`
	`02 INPUT Age`
	`03 WHILE Age >= 0 DO`
	`04    IF Age >= 18 THEN`
	`05       Num18 = Num18 + Age`
	`06    END IF`
	`07 END WHILE`
	`08 PRINT Num18 - Age`
	
	Error – Line 04 or `IF Age >= 18` and Correction – `IF Age >18`
	
	Error – Line 05 or `Num18 =Num18 + Age` and Correction – `Num18 = Num18 + 1`
	
	Error – Line 08 or `PRINT Num18 – Age` and Correction – `PRINT Num18`
	
	Error – `INPUT Age` missing inside loop and Correction – Include `INPUT Age` after test and before exiting loop
		4

Question	Answer	Marks
3	1 mark for each correctly completed element of the grid <table><tr><td>*Variable*</td><td>*Data Type*</td><td>*Appropriate Validation Check*</td></tr><tr><td>*EmployeeID*</td><td>String</td><td>Length Check / Presence Check / Format Check / Type check</td></tr><tr><td>*Manager*</td><td>Boolean</td><td>Type Check / Presence Check</td></tr><tr><td>*AnnualHoliday*</td><td>Integer</td><td>Type Check / Range Check / Presence Check</td></tr><tr><td>*PayGrade*</td><td>Char</td><td>Presence Check / Length Check / Type Check</td></tr></table>	**8**

Question	Answer	Marks
4	1 mark for each correct column	**4**

A	B	C	Output
4	4	4	
	8	3	
	12	2	
	16	1	16
3	3	3	
	6	2	
	9	1	9
–1			Exit

Question	Answer	Marks

5(a)	– initialising counter outside the loop
	– updating counter inside loop
	– suitable exit value at start of loop
	– correct use of WHILE … DO … ENDWHILE
	
	Example:
	
	``
	INPUT Num
	Counter ← 1
	WHILE Counter <= 12 DO
	    Num ← Num * Counter
	    A [Counter] ← Num
	    Counter ← Counter + 1
	ENDWHILE
	``
		4

5(b)	– WHILE has criteria check at start / pre-test – may never run – REPEAT UNTIL has criteria check at end / post-test – will always run at least once	**4**

6(a)	Alan Swales Chantel Law
	
	      Correct data
	      Correct order
		2

6(b)	(see table below)	**4**

6(b):

Field:	Device ID	Device Type	Purchase Date	Purchase Price ($)
Table:	DEVICE	DEVICE	DEVICE	DEVICE
Sort:				
Show:	☑	☑	☐	☐
Criteria:		Like 'Desktop'	<#31/12/2016#	
or:				<1000

1 mark for each correct column