Published

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Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.
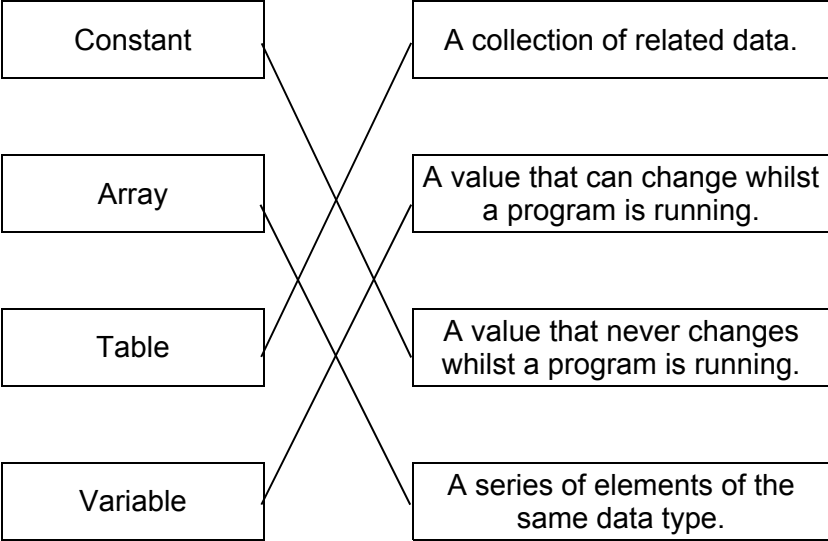
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Cambridge Assessment International Education **[Turn over**

Question	Answer	Marks

1(a)(i)	1 mark for appropriate variable name, 1 mark for appropriate data type, 1 mark for appropriate use.
	
	Many correct answers, they must be meaningful. These are examples only.
	  – `HireTotal,` integer, running total of money taken (for the day)
	  – `HoursHired,` real, running total of hours hired for the day
	  – `Returned,` real, hour and fraction of hour when next returned
		3

1(a)(ii)	1 mark for appropriate constant name, 1 mark for appropriate value.
	
	Many correct answers, they must be meaningful. These are examples only.
	  – `HourPrice, 20.00`
	  – `HalfHourPrice 12.00`
		2

1(b)	1 mark for validation check, all checks must be different, 1 mark for the reason and 1 mark for the test data. The only inputs for task 1 can be length of hire, money taken, time of hire and time of return. There are many possible correct answers these are examples only. Validation check – range check for time of hire Reason – cannot be hired before 10:00 returned after 17:00 Test data – 12:00, 19:00 Validation check – type check for money taken Reason – must be a numeric value Test data – 20.00, bob	6

Question	Answer	Marks

1(c)	– any loop for 10 boats (1 mark)
	
	Four from:
	    – Initialisation
	    – check `HoursHired` **against** `MaxHoursHired` …
	        … store the `BoatNumber`
	        … update `MaxHoursHired` if greater
	    – check if `HoursHired = 0` …
	        … if so add 1 to `NumberBoatsUnused`
	    – update daily totals (for hours and money)
	    – output report with messages (including totals for hours and money, and number of boats unused and the most used boat).
	                                                                     Max 4 marks
	
	Example:
	<pre>MaxHoursHired ← 0
	TotalHoursHired ← 0
	TotalMoney ← 0
	NumberBoatsUnused ← 0
	FOR BoatNumber ← 1 to 10
	  TotalMoney ← TotalMoney + Money(BoatNumber)
	  TotalHoursHired ← TotalHoursHired + HoursHired(BoatNumber)
	  IF HoursHired(BoatNumber) = 0
	    THEN NumberBoatsUnused ← NumberBoatsUnused + 1
	  ENDIF
	  IF HoursHired(BoatNumber) > MaxHoursHired
	    THEN
	      MostUsed ← BoatNumber
	      MaxHoursHired ← HoursHired(BoatNumber)
	  ENDIF
	NEXT BoatNumber
	PRINT "Boats were hired for ", TotalHoursHired, " hours"
	PRINT "Total amount of money taken was ", TotalMoney
	PRINT NumberBoatsUnused, " boats were not used"
	Print "Boat number ", MostUsed, " was used most"</pre>
		5

Question	Answer	Marks

1(d)	Maximum 4 marks in total for question part
	
	e.g.
	Explanation (may include reference to program statements)
	   – check all boats for…
	   – … return time < current time // current booking slot available or return time > current time// current booking slot not available
	   – keep a running total of those available
	   – display number of boats
	
	Example:
	`FOR BoatNumber ← 1 to 10` loop to check for all boats
	  `IF ReturnTime(BoatNumber) <= CurrentTime` check return time against current time
	    `THEN BoatsAvailable ← BoatsAvailable + 1` keep a running total
	  `ENDIF`
	`NEXT BoatNumber`
	`PRINT "Number of boats available ", BoatsAvailable` display number of boats
		4

Question	Answer	Marks

2	1 mark for each, there may be other solutions, award full marks for any working solution
	
	any **six** from:
	    initialise total (outside loop)
	    Input number of numbers (outside loop with validation)
	    Loop using input value
	    Input number (inside loop)
	    Update Total (inside loop)
	    Calculate average
	    Print average and total (outside loop)
	
	Sample algorithm:
	<pre>INPUT NumberCount
	Total ← 0
	FOR Count ← 1 TO NumberCount
	  INPUT Number
	  Total ← Total + Number
	NEXT
	Average ← Total/NumberCount
	  PRINT Total, Average</pre>
		6

Question	Answer	Marks
3	1 mark for each correct line, max **3** marks.	**3**

Question	Answer	Marks

4	2 marks for identification, 1 mark for description, 1 mark for reason.
	
	 Identification:
	      CASE …
	      … OF … OTHERWISE … (ENDCASE) or
	      … OF … (OTHERWISE) … ENDCASE
	
	 Description:
	     – a statement that allows for multiple selections // not any of the above
	
	 Reason:
	     – to simplify pseudocode/ make pseudocode more understandable etc.
		4

Question	Answer	Marks
5(a)	(see table below)	**5**

Accept	Reject	Count	Sack	OUTPUT
0	0	0		
1		1	50.4	
2		2	50.3	
	1	3	49.1	
3		4	50.3	
4		5	50.0	
5		6	49.5	
6		7	50.2	
7		8	50.3	
8		9	50.5	
	2	10	50.6	8 2

←   (1 mark)   →←   (1 mark)   →←   (1 mark)   →←   (1 mark)   →←   (1 mark)   →

Question	Answer	Marks
5(b)	– change to `Is Count = 50?` – remove `IS Sack > 50.5?`	**2**

Question	Answer	Marks

6(a)	– 1 mark for each field suitable name, 1 mark for appropriate data type and appropriate data sample
	
	The following are examples there are many different correct answers.
	
	  – Engine Number, text, 21012
	  – Class, text, P6
	  – Service Date, date, 4/3/2017
		6

6(b)	– Engine Number // Correct field number	**1**
6(c)		**3**

6(c):

Field:	Engine Number	Class	Service Date	
Table:	TRAIN	TRAIN	TRAIN	
Sort:				
Show:	☑	☐	☐	☐
Criteria:		Like 'P*' // Like 'P?'	<10/11/2016	
or:				
	(1 mark)	(1 mark)	(1 mark)	