Cambridge O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

COMPUTER SCIENCE **2210/22**

Paper 2 **October/November 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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Cambridge International is publishing the mark schemes for the October/November 2017 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

Cambridge Assessment International Education

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

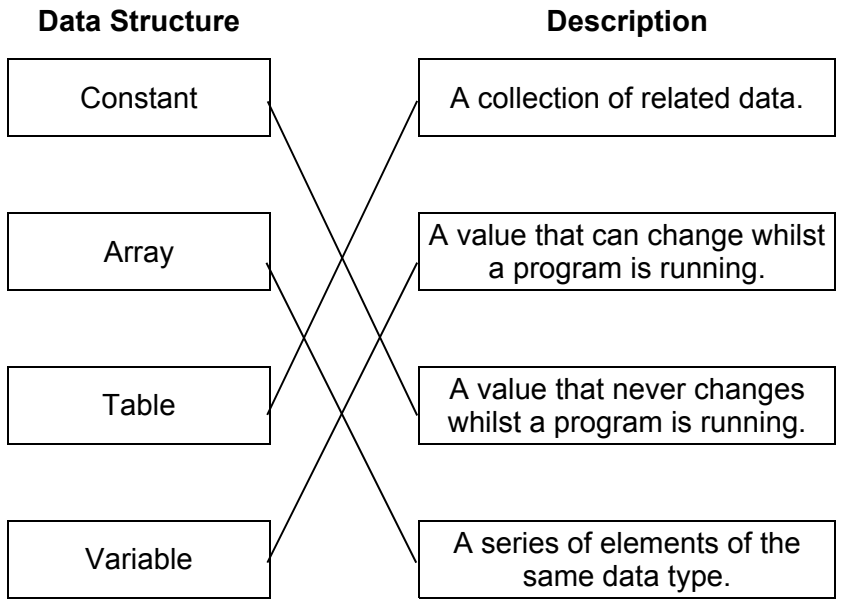
1(c)	– any loop for 10 boats (1 mark)
	
	Four from:
	– Initialisation
	– check `HoursHired` against `MaxHoursHired` …
	… store the `BoatNumber`
	… update `MaxHoursHired` if greater
	– check if `HoursHired = 0` …
	… if so add 1 to `NumberBoatsUnused`
	– update daily totals (for hours and money)
	– output report with messages (including totals for hours and money, and number of boats unused and the most used boat).
	
	Max 4 marks
	
	Example:
	`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"`
		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:
	`INPUT NumberCount`
	`Total ← 0`
	`FOR Count ← 1 TO NumberCount`
	`  INPUT Number`
	`  Total ← Total + Number`
	`NEXT`
	`Average ← Total/NumberCount`
	`  PRINT Total, Average`
		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

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>5(a)</td><td>
<table>
<tr><th>Accept</th><th>Reject</th><th>Count</th><th>Sack</th><th>OUTPUT</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td></td><td></td></tr>
<tr><td>1</td><td></td><td>1</td><td>50.4</td><td></td></tr>
<tr><td>2</td><td></td><td>2</td><td>50.3</td><td></td></tr>
<tr><td></td><td>1</td><td>3</td><td>49.1</td><td></td></tr>
<tr><td>3</td><td></td><td>4</td><td>50.3</td><td></td></tr>
<tr><td>4</td><td></td><td>5</td><td>50.0</td><td></td></tr>
<tr><td>5</td><td></td><td>6</td><td>49.5</td><td></td></tr>
<tr><td>6</td><td></td><td>7</td><td>50.2</td><td></td></tr>
<tr><td>7</td><td></td><td>8</td><td>50.3</td><td></td></tr>
<tr><td>8</td><td></td><td>9</td><td>50.5</td><td></td></tr>
<tr><td></td><td>2</td><td>10</td><td>50.6</td><td>8 2</td></tr>
<tr><td></td><td></td><td></td><td></td><td></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>– change to <code>Is Count = 50?</code>
– remove <code>IS Sack > 50.5?</code></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 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</td><td>6</td></tr>
<tr><td>6(b)</td><td>– Engine Number // Correct field number</td><td>1</td></tr>
<tr><td>6(c)</td><td>
<table>
<tr><td>Field:</td><td>Engine Number</td><td>Class</td><td>Service Date</td><td></td></tr>
<tr><td>Table:</td><td>TRAIN</td><td>TRAIN</td><td>TRAIN</td><td></td></tr>
<tr><td>Sort:</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Show:</td><td>☑</td><td>☐</td><td>☐</td><td>☐</td></tr>
<tr><td>Criteria:</td><td></td><td>Like ‘P*’ // Like ‘P?’</td><td><10/11/2016</td><td></td></tr>
<tr><td>or:</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>(1 mark)</td><td>(1 mark)</td><td>(1 mark)</td><td></td></tr>
</table>
</td><td>3</td></tr>
</table>