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**

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| Question | Answer | Marks |
|---|---|---|
| 1(a)(i) | 1 mark for appropriate variable name, 1 mark for appropriate data type, 1 mark for appropriate use.<br><br>Many correct answers, they must be meaningful. These are examples only.<br>– `HireTotal`, integer, running total of money taken (for the day)<br>– `HoursHired`, real, running total of hours hired for the day<br>– `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.<br><br>Many correct answers, they must be meaningful. These are examples only.<br>– `HourPrice, 20.00`<br>– `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.<br>The only inputs for task 1 can be length of hire, money taken, time of hire and time of return.<br><br>There are many possible correct answers these are examples only.<br><br>Validation check – range check for time of hire<br>Reason – cannot be hired before 10:00 returned after 17:00<br>Test data – 12:00, 19:00<br>Validation check – type check for money taken<br>Reason – must be a numeric value<br>Test data – 20.00, bob | **6** |

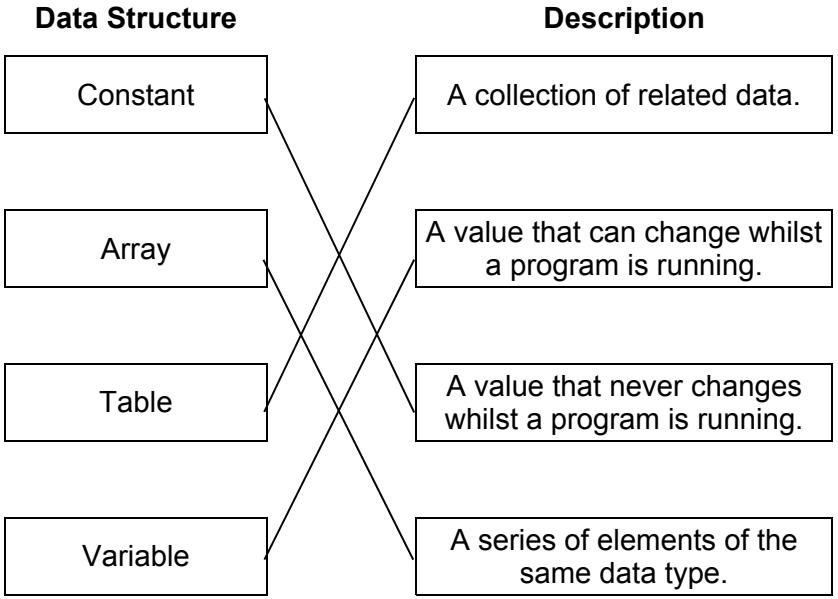
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| Question | Answer | Marks |
|---|---|---|
| 1(c) | – any loop for 10 boats (1 mark)<br><br>**Four** from:<br>– Initialisation<br>– check `HoursHired` against `MaxHoursHired` …<br>… store the `BoatNumber`<br>… update `MaxHoursHired` if greater<br>–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

| Question | Answer | Marks |
|---|---|---|
| 1(d) | Maximum 4 marks in total for question part<br><br>e.g.<br>**Explanation** (may include reference to program statements)<br>– check all boats for…<br>– … return time < current time // current booking slot available or return time > current time// current booking slot not available<br>– keep a running total of those available<br>– display number of boats<br><br>Example:<br>`FOR BoatNumber ← 1 to 10` loop to check for all boats<br>`  IF ReturnTime(BoatNumber) <= CurrentTime` check return time against current time<br>`  THEN BoatsAvailable ← BoatsAvailable + 1` keep a running total<br>`  ENDIF`<br>`NEXT BoatNumber`<br>`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<br><br>any **six** from:<br>initialise total (outside loop)<br>Input number of numbers (outside loop with validation)<br>Loop using input value<br>Input number (inside loop)<br>Update Total (inside loop)<br>Calculate average<br>Print average and total (outside loop)<br><br>Sample algorithm:<br>`INPUT NumberCount`<br>`Total ← 0`<br>`FOR Count ← 1 TO NumberCount`<br>`  INPUT Number`<br>`  Total ← Total + Number`<br>`NEXT`<br>`Average ← Total/NumberCount`<br>`  PRINT Total, Average` | **6** |

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| Question | Answer | Marks |
|---|---|---|
| 3 | 1 mark for each correct line, max **3** marks.<br><br> | **3** |

| Question | Answer | Marks |
|---|---|---|
| 4 | 2 marks for identification, 1 mark for description, 1 mark for reason.<br><br>Identification:<br>`CASE …`<br>`… OF … OTHERWISE … (ENDCASE)` or<br>`… OF … (OTHERWISE) … ENDCASE`<br><br>Description:<br>– a statement that allows for multiple selections // not any of the above<br><br>Reason:<br>– 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>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
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</table>
← (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><br>– remove <code>IS Sack > 50.5?</code></td><td>2</td></tr>
</table>

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<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<br><br>The following are examples there are many different correct answers.<br><br>– Engine Number, text, 21012<br>– Class, text, P6<br>– 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>
</table>
(1 mark) (1 mark) (1 mark)
</td><td>3</td></tr>
</table>

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