MARK SCHEME for the May/June 2015 series

0478 COMPUTER SCIENCE

0478/22 Paper 2 (Written), maximum raw mark 50

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.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2015 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.
Section A

1 (a) (i) Many correct answers, they must be meaningful. This is an example only.
   - PupilName[1:30]
   or PupilName[0:29]
   or PupilName[30]
   or PupilName[29]
   or PupilName[]
   [1]

(ii) Many correct answers, they must be meaningful. This is an example only.
   - StartWeight[1:30]
   or StartWeight[0:29]
   or StartWeight[30]
   or StartWeight[29]
   or StartWeight[]
   [1]

(iii) Answers, must match (i) and (ii) above and the upper bound should have been changed from 30 to 600 or 29 to 599 or no change if not used.
   - StartWeight[1:600] or StartWeight[600]
   - PupilName[1:600] or PupilName[600]
   [1]

(b) any four from
   - prompt for entry of final weight that includes pupil’s name
   - input final weight
   - validation check for final weight
   - calculation of difference in weight
   - ……using the initial weight stored in the array
   - store difference in weight
   (Max 4 marks)

   – loop for 600 pupils
   (1 mark)

   sample algorithm:

   FOR Count ← 1 TO 600
   REPEAT
       PRINT 'Please enter weight for ', PupilName[Count]
       INPUT FinalWeight
       UNTIL FinalWeight < 120 AND FinalWeight > 20
       WeightDifference[Count] ← FinalWeight - StartWeight[Count]
   NEXT Count
(c) (i) any two from
– check that the weights are within a given range
– check that the weights are numeric
– check that the weights are given to one decimal point
– character/type check on name
– length check on name

(ii) 1 mark for the data and 1 mark for the matching reason.
There are many possible correct answers this is an example only.
Weight 1 – 35.2
Reason – normal data that should be accepted

Weight 2 – twenty
Reason – abnormal data that should be rejected

(d) Maximum 6 marks in total for question part
Explanation (max 6)
– loop 30 or 600 times to check each difference in weight
– check for a difference in weight
– less than -2.5 (final weight – start weight) or greater than 2.5 (start weight – final weight)
– …if so output pupil’s name
– …if so output difference in weight
– …if so output message that it is a fall in weight

Sample algorithm (max 4)
FOR Count ← 1 TO 30
    IF WeightDifference [Count] < -2.5
    THEN PRINT PupilName[Count], 'The weight loss was ', WeightDifference [Count]
ENDIF
NEXT Count

If pseudocode or programming only and no explanation, then maximum 4 marks
Section B

2 1 mark for each error identified + suggested correction
Line 1 or Large =9999: this should read Large = 0
Line 3 or WHILE: this should read WHILE Counter < 30
line 6 or IF: this should read IF Num > Large THEN Large = Num
line 7 or Counter =...: this should read Counter = Counter + 1

3 (a)
Trace table set 1

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Total</th>
<th>Check</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
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<td>4</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>38</td>
<td>5</td>
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</tr>
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</table>

---(1 mark)-------------------------
----------(1 mark)------
---(1 mark)

Trace table set 2

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<th>Check</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>3</td>
<td>45</td>
<td>1</td>
<td>Reject</td>
</tr>
</tbody>
</table>

---(1 mark)-------------------------
----------(1 mark)------
---(1 mark)

(b) – (modulo 11) check digit calculation

(c) 1 mark for identifying the problem, 2 marks for the solution
Problem – doesn’t deal correctly with remainder 10/a check digit of X
Solution – check Z for X as a final digit
– have a special case where check = 10
– accept where Check = 10 and F = X
4 1 mark for each correct line, two lines from one box not allowed

Counting

Repetition

Selection

Totalling

\[
\text{Sum} = \text{Sum} + \text{Value}[n]
\]

\[
\text{IF Value} = 10 \text{ THEN PRINT 'X'}
\]

\[
\text{FOR Counter} = 1 \text{ TO 10}
\]

\[
\text{Amount} = \text{Amount} + 1
\]

\[
\text{Sum} = \text{Num1} + \text{Num2}
\]

5 (a) 1 mark for FOR ... TO ... NEXT 1 mark for INPUT

\[
\text{FOR Count} \leftarrow 1 \text{ TO 1000}
\]

\[
\text{INPUT A[Count]}
\]

\[
\text{NEXT (Count)}
\]

(b) 4 marks
– initialisation
– start of loop
– update loop counter
– end of loop

Example 1

\[
\text{Count} \leftarrow 1 \quad (1 \text{ mark})
\]

\[
\text{REPEAT} \quad (1 \text{ mark})
\]

\[
\text{INPUT A[Count]}
\]

\[
\text{Count} \leftarrow \text{Count} + 1 \quad (1 \text{ mark})
\]

\[
\text{UNTIL Count} > 1000 \quad (1 \text{ mark})
\]

Example 2

\[
\text{Count} \leftarrow 0 \quad (1 \text{ mark})
\]

\[
\text{WHILE Count} < 1000 \quad (1 \text{ mark})
\]

\[
\text{DO} \quad (1 \text{ mark})
\]

\[
\text{Count} \leftarrow \text{Count} + 1 \quad (1 \text{ mark})
\]

\[
\text{INPUT A[Count]}
\]

\[
\text{ENDWHILE} \quad (1 \text{ mark})
\]
6  (a) – 7  

(b) – Class ID
   – Uniquely identifies each student  

(c) Diana Abur, Paul Smith
   – both names
   – ……. correct order  

(d) 

<table>
<thead>
<tr>
<th>Field:</th>
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<th>English</th>
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<td>Sort:</td>
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<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Criteria:</td>
<td>&lt;40</td>
<td>&lt;40</td>
<td></td>
</tr>
<tr>
<td>or:</td>
<td>(1 mark)</td>
<td>(1 mark)</td>
<td>(1 mark)</td>
</tr>
</tbody>
</table>

[1] [2] [3]