MARK SCHEME for the May/June 2015 series

2210 COMPUTER SCIENCE

2210/21   Paper 2, 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.

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Section A

1 (a) (i) **Many correct answers, they must be meaningful. These are examples only.**
      –   `MiddayTemperature[1:30]`
    or   `MiddayTemperature[0:29]`
    or   `MiddayTemperature[30]`
    or   `MiddayTemperature[29]`
    or   `MiddayTemperature[]`   (1 mark)
      –   `MidnightTemperature[1:30]`
    or   `MidnightTemperature[0:29]`
    or   `MidnightTemperature[30]`
    or   `MidnightTemperature[29]`
    or   `MidnightTemperature[]`   (1 mark)   [2]

  (ii) Answers, must match above and the upper bound should have been changed from 30 to 7 or 29 to 6 or no change if not used. These are examples only.
      –   `MiddayTemperature[1:7] MidnightTemperature[1:7]`
    or   `MiddayTemperature[7] MidnightTemperature[7]`   [1]

  (iii) Any **two** variables with matching reasons, **1** mark for the variable and **1** mark for the matching reason. The variables and the matching reasons must relate to the tasks in the pre-release. There are many possible correct answers these are examples only.
  Variable   –   `Counter: (Integer)`
  Reason   –   to use as a loop counter when entering the temperature

  Variable   –   `HighNoon: (Real)`
  Reason   –   to store the highest midday temperature   [4]

(b) If loop used
- initialisation before loop
- loop
- running total inside loop
- calculation of average outside loop
- output of average with message outside loop

(Max 4 marks)

- completion of at least 3 of initialisation, running total, calculation of average and output of average with message for **both** midday and midnight

(1 mark)   [5]

sample algorithm:

```
MiddayTotal ← 0; MidnightTotal ← 0
FOR Count ← 1 TO 7
  MiddayTotal ← MiddayTotal + MiddayTemperature[Count]
  MidnightTotal ← MidnightTotal + MidnightTemperature[Count]
NEXT Count
MiddayAverage ← MiddayTotal/7
MidnightAverage ← MiddayTotal/7
PRINT 'The average midday temperature is ', MiddayAverage
PRINT 'The average midnight temperature is ', MidnightAverage
```

If loop not used
- total of 7 midday temperatures
- calculation of midday average *(Note could be combined as one calculation, see example below)*
- total of 7 midnight temperatures
- calculation of midnight average *(Note could be combined as one calculation, see example below)*
- output of both averages with suitable messages   [5]

sample algorithm:

```
MiddayAverage ← (MiddayTemperature[1]+ MiddayTemperature[2]+
MiddayTemperature[3]+ MiddayTemperature[4]+
MiddayTemperature[5]+ MiddayTemperature[6]+
MiddayTemperature[7])/7
MidnightAverage ← (MidnightTemperature[1]+
MidnightTemperature[2]+ MidnightTemperature[3]+ Midnight[4]+
Midnight[5]+ Midnight[6]+ MidnightTemperature[7])/7

PRINT 'The average midday temperature is ', MiddayAverage
PRINT 'The average midnight temperature is ', MidnightAverage
```

(c) **1** mark for the data set and **1** mark for the matching reason.
There are many possible correct answers, these are examples only.
Data set   –   30, 29, 28, 31.5, 32.3, 33, 29.7
Reason   –   normal data that should be accepted

Data set   –   twenty, 23.99, seventeen, 501, –273, @#@, seventy seven
Reason   –   abnormal data that should be rejected   [2]

(d) Maximum 6 marks **in total** for question part
Explanation (max 6)
– set variable called HighestMidday to a large minus number
– loop (30 or 7) times to check each midday temperature in turn
– check midday temperature against HighestMidday / midday temperature > HighestMidday
– …replace value in HighestMidday by midday temperature
– …store array index in MiddayMonthDay/MiddayWeekday
– output HighestMidday outside the loop
– output MiddayMonthDay/MiddayWeekday outside the loop

Sample algorithm (max 4):
```
HighestMidday ← -999
FOR Count ← 1 TO 7
  IF MiddayTemperature [Count] > HighestMidday
    THEN HighestMidday ← MiddayTemperature[Count]
  MiddayMonthDay/MiddayWeekday ← Count
ENDIF
NEXT Count
 PRINT 'The highest midday temperature was ',HighestMidday, ' on
day ', Count
```

If pseudocode or programming only and no explanation, then maximum 4 marks   [6]

Section B

2 1 mark for each error identified + suggested correction
Line 1 or Small = 0: this should read **Small = 999**
line 5 or IF…: this should read **IF Num < Small THEN Small = Num**
line 8 or UNTIL: this should read **UNTIL Counter = 10** or
  UNTIL Counter > = 10 or
  UNTIL Counter > 9
line 7 or PRINT…: **PRINT Small** should come after the end of the repeat loop
or
line 8 or UNTIL: this should come before line 7 [4]

3

Total	Reject	Weight	Output
0	0		
1.8		1.8	
	1	26.0	
8.8		7.0	
20.1		11.3	
30.1		10.0	
32.6		2.5	
	2	25.2	
37.6		5.0	
57.4		19.8	
	3	29.3	
		–1	57.4, 3

(2 marks) (1 mark) 1 mark) (1 mark)
(–1 for each error) (allow follow through)
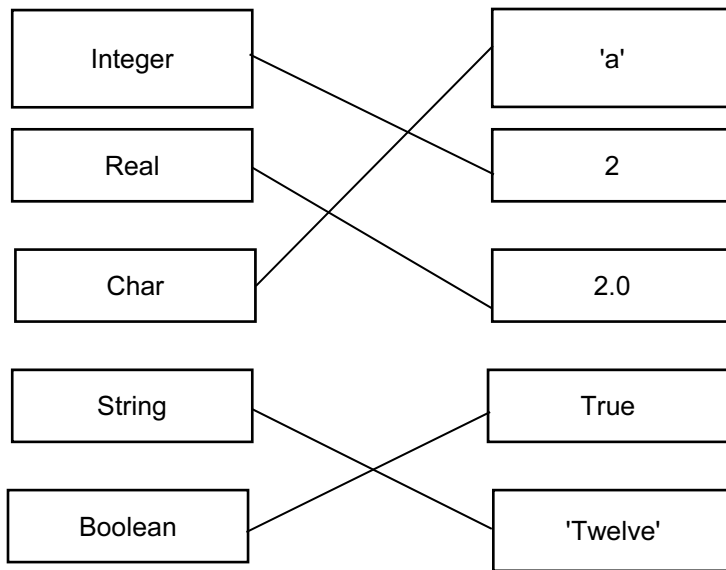(then follow though) (from Total and Reject)

[5]

4 1 mark for each correct link, up to maximum of 4 marks

[4]

5 Any **two** points from
  − a variable is used to store data that can change during the running of a program
  − a constant is used to store data that will not be changed during the running of a program [2]

6 − `FOR (… TO … NEXT)`
  − `REPEAT (… UNTIL)`
  − `WHILE (… DO … ENDWHILE)` [3]

7 (a) − 7 [1]

  (b) − Brochure No
    − Uniquely identifies each property [2]

  (c) Garage   −   Boolean
    Number of Bedrooms   −   Number/Integer/Single
    Price in $ −   Number/Single/Real/Currency [3]

  (d) 399000   H13
    450000   H10 [2]

(e)

Field:	Property Type	Garage	Price in $	Brochure No
Table:	PROPERTY	PROPERTY	PROPERTY	PROPERTY
Sort:				
Show:	☑	☐	☑	☑
Criteria:		True	< 200000	
or:				

or

Field:	Property Type	Garage	Price in $	Brochure No
Table:	PROPERTY	PROPERTY	PROPERTY	PROPERTY
Sort:				
Show:	☑	☐	☑	☑
Criteria:		Yes	< 200000	
or:				

or

Field:	Property Type	Garage	Price in $	Brochure No
Table:	PROPERTY	PROPERTY	PROPERTY	PROPERTY
Sort:				
Show:	☑	☐	☑	☑
Criteria:		=Yes	< 200000	
or:				

or

Field:	Property Type	Garage	Price in $	Brochure No
Table:	PROPERTY	PROPERTY	PROPERTY	PROPERTY
Sort:				
Show:	☑	☐	☑	☑
Criteria:		=-1	< 200000	
or:				

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

[4]