**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**Cambridge International General Certificate of Secondary Education**

# MARK SCHEME for the May/June 2015 series

# 0478 COMPUTER SCIENCE

**0478/21** Paper 2 (Written), maximum raw mark 50

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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]

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**(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
```

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**(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]

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## 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]

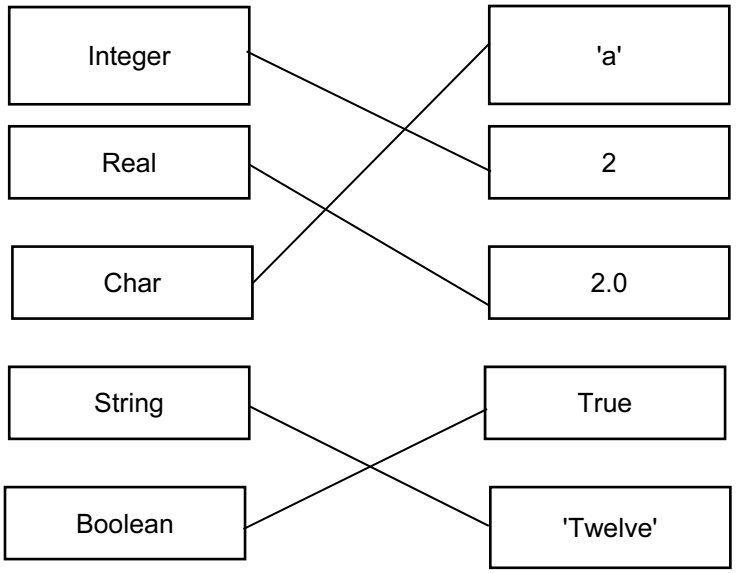
**3**

| 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)<br>(–1 for each error)<br>(then follow though) | (1 mark) | 1 mark) | (1 mark)<br>(allow follow through)<br>(from Total and Reject) |

[5]

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**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]

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**(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]

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