

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2015 series

0478 COMPUTER SCIENCE

0478/23

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) Any **two** variables with matching uses, **one** mark for the variable and **one** mark for the matching use. The variables and the matching uses must relate to the tasks on the exam paper. There are many possible correct answers these are examples only.
- Variable 1 – Counter(: INTEGER)
 Use – to use as a loop counter when entering the temperatures
- Variable 2 – HighestTemperature(: REAL)
 Use – to store the highest temperature recorded [4]

- (ii) Any **two** constant with matching uses, **one** mark for the constant and **one** mark for the matching use. The constants and the matching uses must relate to the tasks on the exam paper. There are several possible correct answers these are examples only.
- Constant 1 – MinApartmentTemperature = 21.5/22
 Use – to keep the temperature when the air-conditioning should be switched off
- Constant 2 – MaxApartmentTemperature = 24.5/24
 Use – to keep the temperature when the air-conditioning should be switched on [4]

- (b) Any **four** from:
- initialisation, set highest apartment temperature to a low value, set lowest apartment temperature to a high value outside loop
 - input temperature
 - store in array
 - test for temperature > highest apartment temperature reset highest apartment temperature if this is the case
 - test for temperature < lowest apartment temperature reset lowest apartment temperature if this is the case
 - calculate range
 - output highest temperature, lowest temperature and the range outside loop (Max **four** marks)
 - loop 60 times must have both tests within the loop, initialisation before the loop and output after the loop (**One** mark) [5]

sample algorithm:

```

HighestTemp ← 0; LowestTemp ← 100
FOR Count ← 1 to 60
  INPUT Temperature
  ApartmentTemp[Count] ← Temperature
  IF ApartmentTemp[Count] > HighestTemp
    THEN HighestTemp ← ApartmentTemp[Count]
  ENDIF
  IF ApartmentTemp[Count] < LowestTemp
    THEN LowestTemp ← ApartmentTemp[Count]
  ENDIF
NEXT Count
Range ← HighestTemp - LowestTemp
PRINT 'Highest Temperature recorded ', HighestTemp
PRINT 'Lowest Temperature recorded ', LowestTemp
PRINT 'Range ', Range

```

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(c) (i) Explanation **six** marks from:

- 1 – **check if highest temperature ≤ 24 and lowest temperature ≥ 22 ...**
 - ... message temperature always within acceptable range then exit
- 2 – **check if highest out of range**
 - so count number of times temperature goes above range
 - message recorded temperature too high on counted number of occasions
- 3 – **check if lowest out of range**
 - so count number of times temperature goes below range
 - message recorded temperature too low on counted number of occasions

General

- check all recorded temperatures (loop)

[6]

(ii) Any **one** from:

- only checks necessary conditions
- uses results from task 2

[1]

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Section B

2 One mark for each error identified + suggested correction

line 5 or `IF Num < 0: this should read IF Num > 0 (THEN Total = Total + Num)`

line 6 or `(IF Num > 0) THEN Counter = Counter + 1:`

this should read `(IF Num > 0 THEN) Poscount = Poscount + 1`

line 7 `Average = Total/Poscount:` this should come after the end of the repeat loop

line 9 or `PRINT Num:` this should read `PRINT Average`

[4]

3 (a) Number 1 Trace Table

X	T1	T2	Output
37	2	5	5
2			2

← (1 mark) →← (1 mark) →

Number 2 Trace Table

X	T1	T2	Output
191	11	15	F
11			B

← (1 mark) →← (1 mark) →

[4]

- (b) – convert a denary number to hexadecimal
– and output it in reverse order

[2]

4 (a) (i) Normal

(ii) Acceptable data to test that the results are as expected.

[2]

- (b) One mark for the data set, one mark for the type and one mark for the matching reason
There are many possible correct answers this is an example only.

Set 1 – Age 4, height 0.9

Type – Boundary/Extreme

Reason – Data to test the validation that is just within the limits of acceptability

Set 2 – Age 10, height 1.4

Type – Abnormal

Reason – Data that should be rejected and produce an error message

[6]

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5 One mark for every **two** correct types

- Boat Name** – text
Model – text
Engine Power – number
Number of Seats – number
Life Raft – “yes/no”/text/Boolean
Day Price – currency/number

0, 1 no marks

2, 3 one mark

4, 5 two marks

6 three marks

[3]

(b) One mark for each correct **different** check

- Boat Name** Presence Check/Type Check/Character Check
Model Format check/Type check/Presence Check/Length check/
Use of Drop-down box to select
Number of Seats Type check/Presence Check/Range Check/
Use of Drop-down box to select
Day Price Type check/Presence Check/Range Check

[4]

(c)

Field:	Boat Name	Model	Day Price	Number of Seats	Engine Power
Table:	BOAT	BOAT	BOAT	BOAT	BOAT
Sort:					
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria:				= 4	> 100
or:					
	(1 mark)	(1mark)	(1 mark)	(1 mark)	(1 mark)

[5]