

## **MARK SCHEME for the October/November 2015 series**

### **2210 COMPUTER SCIENCE**

**2210/23**

Paper 2, maximum raw mark 50

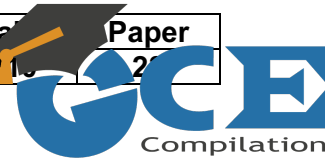
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Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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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

```

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

- 1 – **check if highest temperature  $\leq 24$  and lowest temperature  $\geq 22$ ...**
  - ... 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]

### 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

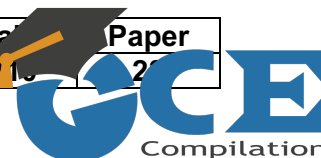
Reason – Data to test the validation that is just within the limits of acceptability

Set 2 – Age 10, height 1.4

Type – Abnormal

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

[6]



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]