Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

COMPUTER SCIENCE **0478/22**

Paper 2 **May/June 2016**

MARK SCHEME

Maximum Mark: 50

Published

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Section A

1 (a) (i) Many correct answers, they must be meaningful. This is an example only.

– `NumSacks`, integer, number of sacks
– `SacksAccepted`, integer, number of sacks accepted
– `TotalWeight`, real, total weight of all sacks [3]

(ii) Any **three** from

– `TopWeight, 50.1`
– `BottomWeight 49.9`
– `TopWeightCement 25.1`
– `BottomWeightCement 24.9` [3]

(b) Any **five** from:

– initialise total weight of order
– input number of sacks for each type *outside loop(s)*
– loop for order completion
– input weight *inside loop(s)*
– add weight of accepted sack to total weight
– output total weight *outside all loop(s)*
– appropriate prompts for input number of sacks for each type and input weight [5]

Max 5 marks

Sample Answer 1

```
INPUT 'Number of sand sacks ordered ' num_sand_ordered
INPUT 'Number of cement sacks ordered ' num_cement_ordered
INPUT 'Number of gravel sacks ordered ' num_gravel_ordered
total_weight ← 0

FOR Counter ← 1 TO num_sand_ordered
   INPUT 'weight of sack of sand ' sack_weight
      total_weight ← total_weight + sack_weight
NEXT Counter
FOR Counter ← 1 TO num_cement_ordered
   INPUT 'weight of sack of cement ' sack_weight
      total_weight ← total_weight + sack_weight
NEXT Counter
FOR Counter ← 1 TO num_gravel_ordered
   INPUT 'weight of sack of gravel' sack_weight
      total_weight ← total_weight + sack_weight
NEXT Counter
Print 'Total weight of sacks is ' total_weight
```

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Sample Answer 2

```
INPUT 'Number of sand sacks ordered ' num_sand_ordered
INPUT 'Number of cement sacks ordered ' num_cement_ordered
INPUT 'Number of gravel sacks ordered ' num_gravel_ordered
total_sacks_ordered ← num_sand_ordered + num_cement_ordered +
num_gravel_ordered
total_weight ← 0

FOR Counter ← 1 TO total_sacks_ordered
   INPUT 'weight of sack ' sack_weight
      total_weight ← total_weight + sack_weight
NEXT Counter
Print 'Total weight of sacks is ' total_weight
```

(c) (i) **1** mark for value reason, all values and reasons must be different. There are many possible correct answers these are examples only.

Data value 49.95
Reason – normal data sand should be accepted

Data value 50.1
Reason – boundary data sand should be rejected [2]

(ii)

Data value 25
Reason – normal data cement should be accepted

Data value 26.7
Reason – abnormal data cement that should be rejected [2]

(d) Maximum **5** marks in total, maximum **3** marks if only programming statements used

Description (may include reference to program statements)

– use of prices for calculation of regular price either numbers, variables or constants (sand and gravel 2, cement 3)

– description of calculation of regular price, multiply no of sand sacks by 2, multiply no of gravel sacks by 2, multiply no of cement sacks by 3

– output of regular price

– description of calculating the number of special packs using the pack information (2 sacks of sand, 2 sacks of gravel and 1 sack of cement)

– …….repeat until there are no more packs in the order (less than 2 sacks of sand or less than 2 sacks of gravel or no sacks of cement

– calculation of discount price and/or amount saved

– output discount price and/or amount saved [5]

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Section B

2 (i) **1** mark for each improvement

use `FOR … NEXT` instead of `REPEAT … UNTIL`
Move `PRINT` to after the end of the loop
Add error checking to check that the value input is positive [3]

(ii) **3** marks maximum, **1** mark for each improvement correctly included.

Sample answer below

```
1 Total = 0
2   FOR Counter = 1 To 10
3    REPEAT
4      INPUT Num
5   UNTIL Num >0
6      Total = Total + Num
7 NEXT Counter
8 PRINT Total
```

[3]

3

Area	Tins	Height	Width	Doors	Windows
0	0	3	5	1	0
13.5		3	7	0	0
34.5		3	5	0	3
46.5		3	7	1	1
65		–1	0	0	0
	7				

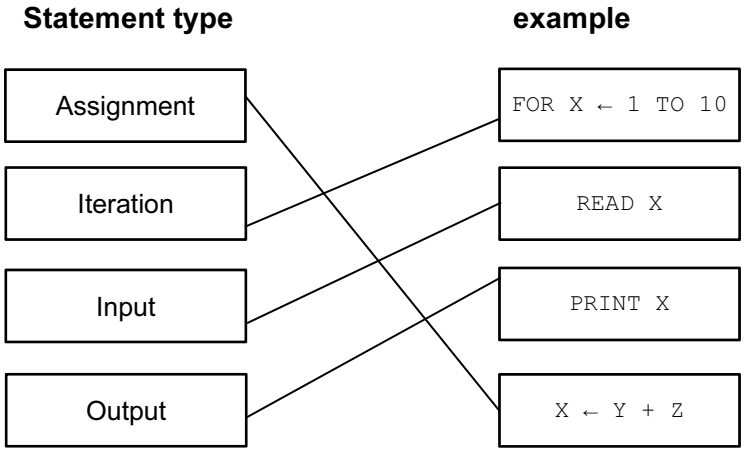
(2 marks) ←(1 mark)→ ← (1 mark) →

1 mark 0, 13.5
1 mark for rest

[4]

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4 **1** mark for each correct line, maximum **3** (zero correct **0**, one correct **1**, two correct **2**, three or four correct **3**), each box must have only one connection.



[3]

5 – data structure (one—dimensional) array …….
– …… reason to simplify programming/ make programs shorter, etc. [2]

6 – `IF (… THEN … ELSE … ENDIF)`

– `CASE (… OF … OTHERWISE … ENDCASE)` [2]

7 **(a)** – 7 [1]

(b) – Brochure Number……..
– ….. Uniquely identifies each record/each Brochure Number different/no duplicates [2]

(c) – Number of Seats – number/integer
– Price in $ – currency/real [2]

(d) **1** mark for each correct result, **1** mark for the results in descending order of price

– Recliner sofa 1,200 RS23
– Recliner chair 600 RC01 [3]

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(e)

Field:	Brochure Number	Material	Colour	Price in $	Number of Seats
Table:	SOFASELECT	SOFASELECT	SOFASELECT	SOFASELECT	SOFASELECT
Sort:					
Show:	☑	☑	☑	☑	☐
Criteria:					>2
or:					
	(1 mark)	(1 mark)	(1 mark)	(1 mark)	(1 mark)

[5]

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