



**Cambridge International Examinations**  
Cambridge Ordinary Level

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**COMPUTER SCIENCE**

**2210/22**

Paper 2

**May/June 2016**

MARK SCHEME

Maximum Mark: 50

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**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)

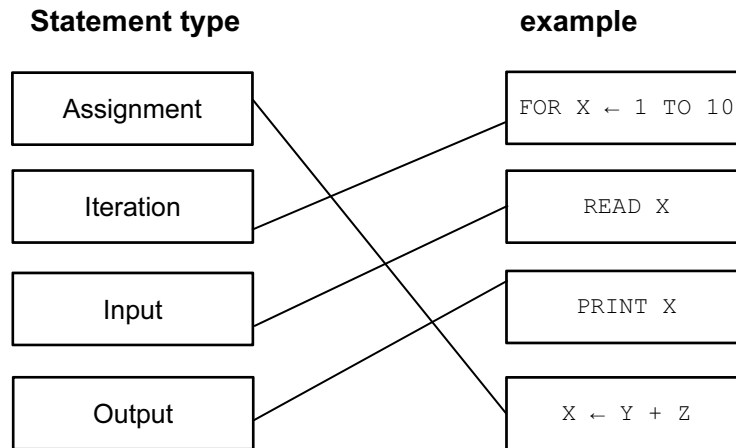
→

1 mark 0, 13.5

1 mark for rest

[4]

- 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 ..... [2]  
 – ..... reason to simplify programming/ make programs shorter, etc. [2]
- 6 – IF (... THEN ... ELSE ... ENDIF) [2]  
 – CASE (... OF ... OTHERWISE ... ENDCASE) [2]
- 7 (a) – 7 [1]
- (b) – Brochure Number..... [2]  
 – ..... Uniquely identifies each record/each Brochure Number different/no duplicates [2]
- (c) – Number of Seats – number/integer [2]  
 – Price in \$ – currency/real [2]
- (d) 1 mark for each correct result, 1 mark for the results in descending order of price [3]  
 – Recliner sofa 1,200 RS23  
 – Recliner chair 600 RC01

(e)

Field:	Brochure Number	Material	Colour	Price in \$	Number of Seats
Table:	SOFASELECT	SOFASELECT	SOFASELECT	SOFASELECT	SOFASELECT
Sort:					
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Criteria:					>2
or:					
	(1 mark)	(1 mark)	(1 mark)	(1 mark)	(1 mark)

[5]