



COMPUTER SCIENCE

0478/22

Paper 2

March 2018

MARK SCHEME

Maximum Mark: 50

Published

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.

Cambridge International will not enter into discussions about these mark schemes.

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This document consists of **9** printed pages.

PUBLISHED**Generic Marking Principles**

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Question	Answer	Marks
Section A		
1(a)(i)	1 mark for name and 1 mark for appropriate data structure from Task 1 e.g. name <code>studentName</code> Data structure <code>Array</code>	2
1(a)(ii)	1 mark for name, 1 mark for appropriate value and 1 mark for appropriate use. From any task e.g. Constant name <code>classSize</code> Value <code>30</code> Use Fixed number of students in a class Variable name <code>counter</code> Data type <code>integer</code> Use to count the number of student names entered	6
1(b)	1 mark for changing the value of a variable/constant/ counter, 1 mark for change to the program e.g. Value: Change the value of the variable/constant <code>maxGroupSize</code> in Task 2 to 25 Program change: Oversubscribed test will be changed to test for over 50 // second group starts at 26	2

Question	Answer	Marks
1(c)	<p>Any five from</p> <ul style="list-style-type: none"> Initialise subject counts Loop through students Input and store student name... ... and input and store two subject choices for that student Update subject counts // update subject lists of student names Error message if subject not found Output total subject counts Prompts for all inputs and messages with all outputs <p>Sample answer for Task 1</p> <pre> physics ← 0; chemistry ← 0; history ← 0; geography ← 0; compSci ← 0; FOR counter ← 1 TO 60 INPUT name, subject(1), subject(2) studentName(counter) ← name studentCounter1(counter) ← subject(1) studentCounter2(counter) ← subject(2) FOR sCount ← 1 TO 2 CASE subject(sCount) OF 'Physics': physics ← physics + 1 'Chemistry': chemistry ← chemistry + 1 'History': history ← history + 1 'Geography': geography ← geography + 1 'Computer Science': compSci ← compSci + 1 OTHERWISE: PRINT 'Error subject not found' ENDCASE NEXT NEXT PRINT 'Group Number of Students' PRINT 'Physics ',physics PRINT 'Chemistry ',chemistry PRINT 'History ',history PRINT 'Geography ',geography PRINT 'Computer Science ',compSci </pre>	5

Question	Answer	Marks
1(d)	Any five from Explanation for calculation of total number of spare places Check the number of students who have chosen each subject If less than 10 no places available (Otherwise) If less than 20... ...Calculate number of spare places (20 – number) If more than 20 and less than 40... ...Calculate number of spare places (40 – number) Keep a running total of the total number of spare places	5

Question	Answer	Marks
Section B		
2(a)	1 mark for each error identified + suggested correction NUMBERS should be Number IF Number > 100 should be IF Number >= 100 INPUT Number is missing from inside the loop insert INPUT Number after the IF statement The final PRINT Number is not needed remove it	4
2(b)	One mark for both ends of the range and correct inequality symbols and one mark for the AND . The test should be IF Number >= 100 AND Number <= 200	2

Question	Answer	Marks																																												
3	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Weight</th> <th>totalWeight</th> <th>totalNumber</th> <th>OUTPUT</th> </tr> </thead> <tbody> <tr> <td></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td></td> </tr> <tr> <td style="text-align: center;">50</td> <td style="text-align: center;">50</td> <td style="text-align: center;">1</td> <td></td> </tr> <tr> <td style="text-align: center;">70</td> <td style="text-align: center;">120</td> <td style="text-align: center;">2</td> <td></td> </tr> <tr> <td style="text-align: center;">65</td> <td style="text-align: center;">185</td> <td style="text-align: center;">3</td> <td></td> </tr> <tr> <td style="text-align: center;">100</td> <td style="text-align: center;">285</td> <td style="text-align: center;">4</td> <td></td> </tr> <tr> <td style="text-align: center;">95</td> <td style="text-align: center;">380</td> <td style="text-align: center;">5</td> <td></td> </tr> <tr> <td style="text-align: center;">50</td> <td style="text-align: center;">430</td> <td style="text-align: center;">6</td> <td></td> </tr> <tr> <td style="text-align: center;">55</td> <td style="text-align: center;">485</td> <td style="text-align: center;">7</td> <td></td> </tr> <tr> <td style="text-align: center;">85</td> <td style="text-align: center;">570</td> <td style="text-align: center;">8</td> <td></td> </tr> <tr> <td style="text-align: center;">70</td> <td style="text-align: center;">640</td> <td style="text-align: center;">9</td> <td style="text-align: center;">Lift overload, step out</td> </tr> </tbody> </table> <p>One mark for each correct column.</p>	Weight	totalWeight	totalNumber	OUTPUT		0	0		50	50	1		70	120	2		65	185	3		100	285	4		95	380	5		50	430	6		55	485	7		85	570	8		70	640	9	Lift overload, step out	4
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Question	Answer	Marks
4	1 mark for value and 1 mark for appropriate reason e.g. Value 1 2 (1) boundary should be accepted as weight OK (1) Value 2 two (1) erroneous/abnormal should be rejected (1)	4

Question	Answer	Marks
5	2 marks for appropriate explanation, 1 mark example programming statements showing sequence, 1 mark example programming statement(s) showing selection e.g. Sequence is the concept of one statement being executed after another(1) whereas selection decides which statement(s) are to be executed depending upon the result of a question (1) sequence example (1) PRINT X PRINT Y Selection example (1) IF X > Y THEN PRINT X ELSE PRINT Y	4

Question	Answer	Marks
6(a)	1 mark for appropriate field name and appropriate data type, then 1 mark for appropriate explanation. e.g. Metal, type text(1) a single character/word that can be input accurately/quickly(1) Item, type text (1) a single character/word that can be input accurately/quickly(1) Number in Stock, type number (1) can be used for calculations (1) Price, type currency (1) properly formatted and can be used for calculations (1)	8
6(b)	All fields could contain duplicate values	1

Question	Answer				Marks																											
6(c)	<table border="1" data-bbox="555 220 1765 523"> <tr> <td data-bbox="555 220 667 268">Field:</td> <td data-bbox="667 220 898 268">Metal</td> <td data-bbox="898 220 1182 268">Item</td> <td data-bbox="1182 220 1482 268">Number in Stock</td> <td data-bbox="1482 220 1765 268">Price</td> </tr> <tr> <td data-bbox="555 268 667 316">Table:</td> <td data-bbox="667 268 898 316">JEWEL</td> <td data-bbox="898 268 1182 316">JEWEL</td> <td data-bbox="1182 268 1482 316">JEWEL</td> <td data-bbox="1482 268 1765 316">JEWEL</td> </tr> <tr> <td data-bbox="555 316 667 363">Sort:</td> <td data-bbox="667 316 898 363"></td> <td data-bbox="898 316 1182 363"></td> <td data-bbox="1182 316 1482 363"></td> <td data-bbox="1482 316 1765 363"></td> </tr> <tr> <td data-bbox="555 363 667 411">Show:</td> <td data-bbox="667 363 898 411"><input type="checkbox"/></td> <td data-bbox="898 363 1182 411"><input type="checkbox"/></td> <td data-bbox="1182 363 1482 411"><input checked="" type="checkbox"/></td> <td data-bbox="1482 363 1765 411"><input checked="" type="checkbox"/></td> </tr> <tr> <td data-bbox="555 411 667 459">Criteria:</td> <td data-bbox="667 411 898 459">="silver"</td> <td data-bbox="898 411 1182 459">="bracelet"</td> <td data-bbox="1182 411 1482 459"></td> <td data-bbox="1482 411 1765 459"></td> </tr> <tr> <td data-bbox="555 459 667 523">or:</td> <td data-bbox="667 459 898 523"></td> <td data-bbox="898 459 1182 523"></td> <td data-bbox="1182 459 1482 523"></td> <td data-bbox="1482 459 1765 523"></td> </tr> </table> <p data-bbox="320 560 1059 627">One mark for columns 1 + 2, one mark for columns 3 + 4 One mark for accuracy of syntax and spelling</p>	Field:	Metal	Item	Number in Stock	Price	Table:	JEWEL	JEWEL	JEWEL	JEWEL	Sort:					Show:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Criteria:	="silver"	="bracelet"			or:					3
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