Cambridge Assessment International Education

Cambridge O Level

COMPUTER SCIENCE **2210/21**

Paper 2 **May/June 2020**

MARK SCHEME

Maximum Mark: 50

Published

Students did not sit exam papers in the June 2020 series due to the Covid-19 global pandemic.

This mark scheme is published to support teachers and students and should be read together with the question paper. It shows the requirements of the exam. The answer column of the mark scheme shows the proposed basis on which Examiners would award marks for this exam. Where appropriate, this column also provides the most likely acceptable alternative responses expected from students. Examiners usually review the mark scheme after they have seen student responses and update the mark scheme if appropriate. In the June series, Examiners were unable to consider the acceptability of alternative responses, as there were no student responses to consider.

Mark schemes should usually be read together with the Principal Examiner Report for Teachers. However, because students did not sit exam papers, there is no Principal Examiner Report for Teachers for the June 2020 series.

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

Cambridge International is publishing the mark schemes for the June 2020 series for most Cambridge IGCSE™ and Cambridge International A & AS Level components, and some Cambridge O Level components.

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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.

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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.

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Question	Answer	Marks

1(a)(i)	Any meaningful array related to **Task 1** – **one** mark (max **two**) e.g.
	`ItemCode`
	`Description`
	
	Correct purpose for each array related to **Task 1** – **one** mark (max **two**) e.g.
	…to store the item codes
	…to store the descriptions of the items for sale
		4

1(a)(ii)	Any meaningful variable related to **Task 1** – **one** mark (max **two**) e.g.
	`PurchaseItem`
	`TotalPrice`
	
	Correct purpose for each variable related to **Task 1** - **one** mark (max **two**) e.g.
	… to allow input of an item/code for purchase
	… to store/calculate the total price of the transaction
		4

1(b)	Any **one** correct statement e.g. • The Code data is made up of letters/alphabetic characters/not numbers • Real data must have numerical value/would not be used in calculations **One** mark for: • String	**2**

Question	Answer	Marks

1(c)	Any **five** from
	• Input with message to allow choice of mobile device
	• Attempt to validate input to check for valid item code
	• Accurate validation of input to check for valid item code
	• Determination of whether device is phone or tablet
	• Restriction to only allow input for SIM card required if mobile device is a phone
	• Input with message to find out if a SIM card is required
	
	Example answer
	`OUTPUT "Which type of phone or tablet would you like? Input the Item Code"`
	`DeviceFlag ← False`
	`WHILE DeviceFlag = False`
	`  INPUT DeviceCode`
	`  Count ← 0`
	`  WHILE Count<10 DO`
	`  IF DeviceCode = ItemCode[Count]`
	`  THEN`
	`  IF Count < 6`
	`  THEN`
	`  DeviceType ← "Phone"`
	`  ELSE`
	`  DeviceType ← "Tablet"`
	`  ENDIF`
	`  DeviceFlag ← True`
	`  Count ← 10`
	`  ENDIF`
	`  Count ← Count + 1`
	`  ENDWHILE`
	`  IF DeviceFlag = False`
	`  THEN`
		5

Question	Answer	Marks

1(c)	`      OUTPUT "Your code doesn't exist, please try again"`
	`  ENDIF`
	`ENDWHILE`
	`IF DeviceType ← "Phone"`
	`  THEN`
	`    OUTPUT "Would you like a SIM Card? (Answer Y or N)"`
	`    INPUT SimRequired`
	`ENDIF`	

1(d)	Any **five** from • Explanation of finding if more than one device is purchased • Explanation of application of device discount • Explanation of calculating the discount(s) and finding the new price • Explanation of outputting new total • Explanation of outputting amount saved • Explanation of messages used	**5**

Question	Answer	Marks
2	<table><tr><th>Statement</th><th>True (✓)</th><th>False (✓)</th></tr><tr><td>A structure diagram is a piece of code that is available throughout the structure of a program.</td><td></td><td>✓</td></tr><tr><td>A structure diagram shows the hierarchy of a system.</td><td>✓</td><td></td></tr><tr><td>A structure diagram is another name for an array.</td><td></td><td>✓</td></tr><tr><td>A structure diagram shows the relationship between different components of a system.</td><td>✓</td><td></td></tr></table> **Two** marks for four correct rows. **One** mark for three correct rows.	**2**

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Question	Answer	Marks
3(a)	**One** mark for each correct validation check (max **two**) • Range • Length • Type • Check Digit **One** mark for each correct related purpose (max **two**) e.g. • To make sure the data entered falls within a specific set of values • To make sure the data entered is no longer than specified • To make sure the data entered follows rules related to whether it is numbers of letters • To make sure an identification code entered is genuine or possible	**4**
3(b)	**One** mark for correct verification check (max **one**) • Double (data) entry • Visual check	**1**
3(c)	Any **two** correct statements (max **two**) e.g. • Validation checks if the data entered is possible/it cannot check if data has been entered correctly. • Verification checks if the data entered matches the data submitted for entry/ it does not check if data matches set criteria.	**2**

Question	Answer	Marks
4(a)	Any **two** correct statements (max **two**) e.g. • The value of the variable Count begins as 0 … • … and is incremented by 1 before it is tested by the loop condition • Count will never be 0 at the end of the loop	**2**

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Question	Answer	Marks

4(b)	```
	Count ← 0
	REPEAT
	  INPUT Number
	  IF Number >= 100
	  THEN
	  Values[Count] ← Number
	  ENDIF
	Count ← Count + 1
	UNTIL Count = 50
	``
	One mark – separate INPUT statement
	One mark – IF statement attempted
	One mark – IF statement completely correct
	One mark – termination of loop updated
		4

4(c)	Any **two** correct statements (max **two**) e.g. • Alter the IFstatement/add a second IF statement/comparison that's already there … • … so that additional criteria set an upper limit of <=200	**2**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>5(a)</td><td>
<table>
<tr><th>Value</th><th>Calc1</th><th>Calc2</th><th>OUTPUT</th></tr>
<tr><td>50</td><td>25</td><td>16</td><td></td></tr>
<tr><td>33</td><td>16</td><td>11</td><td></td></tr>
<tr><td>18</td><td>9</td><td>6</td><td>18</td></tr>
<tr><td>15</td><td>7</td><td>5</td><td></td></tr>
<tr><td>30</td><td>15</td><td>10</td><td>30</td></tr>
<tr><td>-1</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>
One mark for each correct column (max four)
</td><td>4</td></tr>
<tr><td>5(b)</td><td>Any two correct statements e.g.
• The program outputs a value
• That is divisible by 6 // 2 and 3</td><td>2</td></tr>
</table>

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>6(a)</td><td>To uniquely identify a product (in TOOLS)</td><td>1</td></tr>
<tr><td>6(b)</td><td>HS50 Hose (50 metres) 60
GFLG Garden Fork 50
LMPT Lawn Mower (Petrol) 25

One mark for correct data
One mark for correct format
One mark for data in correct order</td><td>3</td></tr>
<tr><td>6(c)</td><td>
<table>
<tr><td>Field:</td><td>Code</td><td>Description</td><td>Quantity_Stock</td><td></td><td></td></tr>
<tr><td>Table:</td><td>TOOLS</td><td>TOOLS</td><td>TOOLS</td><td></td><td></td></tr>
<tr><td>Sort:</td><td>Ascending</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Show:</td><td>☑</td><td>☑</td><td>☑</td><td>☐</td><td>☐</td></tr>
<tr><td>Criteria:</td><td></td><td></td><td><25</td><td></td><td></td></tr>
<tr><td>or:</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
One mark for each completely correct column (max three)</td><td>3</td></tr>
</table>