

#### Cambridge IGCSE™

COMPUTER SCIEN	CE	0478/23	
Paper 2		May/June 2021	
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.

Cambridge International is publishing the mark schemes for the May/June 2021 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

#### Cambridge IGCSE – Mark Scheme 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.

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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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#### Cambridge IGCSE – Mark Scheme **PUBLISHED**

#### Please note the following further points:

The words in **bold** in the mark scheme are important text that needs to be present, or some notion of it needs to be present. It does not have to be the exact word, but something close to the meaning.

If a word is underlined, this **exact** word must be present.

A single forward slash means this is an alternative word. A double forward slash means that this is an alternative mark point.

Ellipsis (...) on the end of one-mark point and the start of the next means that the candidate **cannot** get the second mark point without being awarded the first one. If a MP has ellipsis at the beginning, but there is no ellipsis on the MP before it, then this is just a follow-on sentence and **can** be awarded **without** the previous mark point.

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# Cambridge IGCSE – Mark Scheme **PUBLISHED**

Question	Answer	Marks
	Section A	
1(a)(i)	One mark per bullet point  Constant NumberofOptions  Value 5  Use Storing the maximum number of options (for the referendum)	3
1(a)(ii)	<ul> <li>One mark per bullet point</li> <li>Variable UniqueNumber</li> <li>Use Storing/inputting the voter's unique identification number</li> </ul>	2
1(a)(iii)	One mark for each valid mark point (Max 4)  Suitable name e.g. IdNumber  Suitable data type e.g. Integer  Suitable array length e.g. 170 (elements)  Suitable sample data e.g. 100  Suitable use e.g. to store the unique numbers	4

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# Cambridge IGCSE – Mark Scheme **PUBLISHED**

Question	Answer	Marks
1(b)	Any six from:  MP1 Initialisation of totalling variables  MP2 Loop to cycle through all the data  MP3 Totalling the votes for at least one of the options  MP4 Totalling the votes for all five options  MP5 Separate totals for students and staff  MP6 Output to show one set of results  MP7 Output to show more than one set of results with messages  MP8 Comprehensive output to show student, staff and combined results, with messages	6
	Example answers Version 1	
	TotalAS $\leftarrow$ 0; TotalBS $\leftarrow$ 0; TotalCS $\leftarrow$ 0; TotalDS $\leftarrow$ 0; TotalSES $\leftarrow$ 0; TotalAF $\leftarrow$ 0;	
	TotalBF $\leftarrow$ 0; TotalCF $\leftarrow$ 0; TotalDF $\leftarrow$ 0; TotalEF $\leftarrow$ 0	
	FOR Count ← 0 TO 150	
	$\texttt{TotalAS} \leftarrow \texttt{TotalAS} + \texttt{StudentA[Count]}$	
	$\texttt{TotalBS} \leftarrow \texttt{TotalBS} + \texttt{StudentB[Count]}$	
	$\texttt{TotalCS} \leftarrow \texttt{TotalCS} + \texttt{StudentC[Count]}$	
	$\texttt{TotalDS} \leftarrow \texttt{TotalDS} + \texttt{StudentD[Count]}$	
	$\texttt{TotalES} \leftarrow \texttt{TotalES} + \texttt{StudentE[Count]}$	
	NEXT Count FOR Count = 0 TO 20	
	FOR COUNT = 0 10 20  TotalAF ← TotalAF + StaffA [Count]	
	TotalBF ← TotalBF + StaffA [Count]	
	TotalCF ← TotalCF + StaffA [Count]	
	TotalDF ← TotalDF + StaffA [Count]	
	TotalEF ← TotalEF + StaffA [Count]	
	NEXT Count	
	OUTPUT "Option Students Staff Total"	
	OUTPUT "A ", TotalAS, TotalAF, (TotalAS + TotalAF)	
	OUTPUT "B ", TotalBS, TotalBF, (TotalBS + TotalBF) OUTPUT "C ", TotalCS, TotalCF, (TotalCS + TotalCF)	
	OUTPUT "D ", TotalDS, TotalDF, (TotalDS + TotalDF)	
	OUTPUT "E ", TotalES, TotalEF, (TotalES + TotalEF)	

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## Cambridge IGCSE – Mark Scheme **PUBLISHED**

Question	Answer	Marks
1(b)	Version 2	
	TotalAS $\leftarrow$ 0; TotalBS $\leftarrow$ 0; TotalCS $\leftarrow$ 0; TotalDS $\leftarrow$ 0; TotalsES $\leftarrow$ 0; TotalAF $\leftarrow$ 0;	
	TotalBF $\leftarrow$ 0; TotalCF $\leftarrow$ 0; TotalDF $\leftarrow$ 0; TotalEF $\leftarrow$ 0	
	OUTPUT "Are you a student? (Y or N)"	
	INPUT Student	
	IF Student = "Y" THEN	
	OUTPUT "Enter your number"	
	INPUT Number	
	<pre>IF Students[Number] = 0 THEN</pre>	
	REPEAT	
	OUTPUT "Enter preference for A"	
	INPUT Vote UNTIL Vote >= 1 and Vote <= 5	
	TotalAS ← TotalAS + Vote  REPEAT	
	OUTPUT "Enter preference for B"	
	INPUT Vote	
	UNTIL Vote >= 1 and Vote <= 5	
	TotalBS ← TotalBS + Vote	
	REPEAT	
	OUTPUT "Enter preference for C"	
	INPUT Vote	
	UNTIL Vote >= 1 and Vote <= 5	
	TotalCS ← TotalCS + Vote	
	REPEAT	
	OUTPUT "Enter preference for D"	
	INPUT Vote	
	UNTIL Vote >= 1 and Vote <= 5	
	TotalDS ← TotalDS + Vote	
	REPEAT	
	OUTPUT "Enter preference for E"	
	INPUT Vote	
	UNTIL Vote >= 1 and Vote <= 5	
	TotalES ← TotalES + Vote	

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## Cambridge IGCSE – Mark Scheme **PUBLISHED**

Question	Answer	Marks
1(b)	$Student[Number] \leftarrow 1$	
` ,	ELSE	
	OUTPUT "Enter your number"	
	INPUT Number	
	IF staff[number] = 0 THEN	
	REPEAT	
	OUTPUT "Enter preference for A" INPUT Vote	
	UNTIL Vote >= 1 and Vote <= 5	
	TotalAS ← TotalAS + Vote REPEAT	
	OUTPUT "Enter preference for B" INPUT Vote	
	UNTIL Vote >= 1 and Vote <= 5	
	TotalBS ← TotalBS + Vote	
	REPEAT	
	OUTPUT "Enter preference for C" INPUT Vote	
	UNTIL Vote >= 1 and Vote <= 5	
	TotalCS ← TotalCS + Vote	
	REPEAT	
	OUTPUT "Enter preference for D" INPUT Vote	
	UNTIL Vote >= 1 and Vote <= 5	
	TotalDS ← TotalDS + Vote REPEAT	
	OUTPUT "Enter preference for E" INPUT Vote	
	UNTIL Vote >= 1 and Vote <= 5	
	TotalES ← TotalES + Vote	
	$Staff[Number] \leftarrow 1$	
	ENDIF	

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# Cambridge IGCSE – Mark Scheme **PUBLISHED**

Question	Answer	Marks
1(b)	OUTPUT "Option Students Staff Total" OUTPUT "A ", TotalAS, TotalAF, (TotalAS + TotalAF) OUTPUT "B ", TotalBS, TotalBF, (TotalBS + TotalBF) OUTPUT "C ", TotalCS, TotalCF, (TotalCS + TotalCF) OUTPUT "D ", TotalDS, TotalDF, (TotalDS + TotalDF) OUTPUT "E ", TotalES, TotalEF, (TotalES + TotalEF)	
1(c)	Any <b>two</b> from:  MP1 Change the maximum preferences constant to 6  MP2 Change the input prompt to show six options  MP3 Change the loop counter  MP4 Change the number of inputs for each person to six  MP5 Add another array/variable to store/total the new option votes	2
1(d)	Explanation Any <b>three</b> from: MP1 Initialise count variables/array for each option MP2 Using a conditional statement to identify preference 1 in at least one option (in the input/stored data) MP3 identify preference 1 in all options MP4 and adding 1 to the appropriate option count in at least one option MP5 for students only MP6 using a loop to cycle through the whole array/set of inputs for each option	3

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# Cambridge IGCSE – Mark Scheme **PUBLISHED**

Question		Answer	Marks
		Section B	
2	Three marks for three or four correct Two marks for two correct One mark for one correct		3
	Data Type	Description	
	Real	Must be a whole number	
	String	Must be one of two values	
	Integer	May be any number	
	Boolean	May contain any combination of characters	

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# Cambridge IGCSE – Mark Scheme **PUBLISHED**

Question		Answer	
3	One mark per mark point for each piece of test data (3 × two marks)  Correct validation check name Correct use identified		6
	Example answers		
	<ul><li>Id27@cambridgeuniversity.</li><li>Validation check name</li><li>Use</li></ul>	<b>com</b> Length (check) Counts the number of characters in the data to make sure it isn't too long (max length 320 characters).	
	<ul><li>2021</li><li>Validation check name</li><li>Use</li></ul>	Range (check) Checks that the number entered fits within given parameters	
	<ul><li>Ericson-Bower</li><li>Validation check name</li><li>Use</li></ul>	Type (check) Checks the type of data entered (in this case) to make sure no numbers are present	

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## Cambridge IGCSE – Mark Scheme **PUBLISHED**

Question	Answer	Marks
4(a)	One mark for error identified and suggested correction	4
	Line 3 - should be FullScore ← 0 Line 7 - should be FullScore ← FullScore + Score Line 8 - should be NEXT Allow ENDFOR // alternatively Line 5 could be REPEAT with StoreLoop ← 0 just above it and StoreLoop ← StoreLoop + 1 between lines 7 and 8.  Line 11 - should be INPUT Another	
	Correct Algorithm 1  1    Count ← 0 2    REPEAT 3    FullScore ← 0 4    INPUT Number 5    FOR StoreLoop ← 1 TO Number 6    INPUT Score 7    FullScore ← FullScore + Score 8    NEXT 9    OUTPUT "The full score is ", FullScore 10    OUTPUT "Another set of scores (Y or N)?" 11    INPUT Another 12    IF Another = "N" 13     THEN 14     Count ← 1 15    ENDIF 16    UNTIL Count = 1	

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## Cambridge IGCSE – Mark Scheme **PUBLISHED**

Question	Answe	Marks
4(a)	Correct Algorithm 2	
	1 Count $\leftarrow$ 0	
	2 REPEAT	
	3 FullScore ← 0	
	4 INPUT Number	
	StoreLoop ← 0	
	5 REPEAT	
	6 INPUT Score	
	7 FullScore ← FullScore + Score	
	StoreLoop ← StoreLoop + 1	
	8 UNTIL StoreLoop = Number	
	9 OUTPUT "The full score is ", FullScore	
	10 OUTPUT "Another set of scores (Y or N)?	
	11 INPUT Another	
	12 IF Another = "N"	
	13 THEN	
	14 Count ← 1	
	15 ENDIF	
	16 UNTIL Count = 1	

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#### Cambridge IGCSE – Mark Scheme **PUBLISHED**

Question	Question Answer Ma		
Question		Allswei	Marks
4(b)	One ma	ark per mark point (Max 4)	4
	MP1	After line 6 // replace line 6	
	MP2	ScoreArray[StoreLoop] ← Score // INPUT ScoreArray[StoreLoop]	
	MP3	between lines 8 and 10	
	MP4	AverageScore ← FullScore/Number	
	MP5	OUTPUT "The average score is ", AverageScore	
	Exampl	e correct algorithm for reference from part 4(a)	
	1	Count ← 0	
	2	REPEAT	
	3	FullScore ← 0	
	4	INPUT Number	
	5	FOR StoreLoop $\leftarrow$ 1 TO Number	
	6	INPUT Score	
	7	FullScore ← FullScore + Score	
	8	NEXT	
	9 10	OUTPUT "The full score is ", FullScore OUTPUT "Another set of scores (Y or N)?"	
	11	·	
	12		
	13		
	14	$\texttt{Count} \leftarrow 1$	
	15	ENDIF	
	16	UNTIL Count = 1	

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May/June 2	2021
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Question					Answer			Marks
5(a)	One mark for each correct column							
	Г	Op	Value1	Value2	Ans	OUTPUT		
		1						
			87					
				14	101			
	_	3						
			2					
				30	60			
	_	5						
			10					
	_			6		Input Error		
		4						
			10					
	_			2	5			
	_	0						
	_							
	_							
	_							
	L							

## Cambridge IGCSE – Mark Scheme **PUBLISHED**

Question	Answer			
5(b)	To work as a calculator // to add, subtract, multiply or divide a pair of numbers			
5(c)	To output/store the result/the value of Ans // Adding prompts for data entry.	1		

Question	Answer			Marks		
6(a)	Two marks for six correct field names One mark for at least three correct field names					
		Field name				
		LicenceNo				
		Mileage				
		TyreFLft				
		TyreFRgt				
		TyreRLft				
		TyreRRgt				

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## Cambridge IGCSE – Mark Scheme **PUBLISHED**

Question	Answer								Marks
6(b)	One mark for correct fieldnames One mark for correct table names and show fields One mark for correct sort One mark for correct search criteria in all columns								4
	Field:	LicenceNo	Mileage	TyreFLft	TyreFRgt	TyreRLft	TyreRRgt		
	Table:	TREAD	TREAD	TREAD	TREAD	TREAD	TREAD		
	Sort:	Ascending							
	Show:	Ø	V	Ø	Ø	✓	Ø		
	Criteria:			<2	<2	<2	<2		
	or:								

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