

	UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS General Certificate of Education Advanced Subsidiary Level and Advanced Level
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CANDIDATE NAME	
CENTRE NUMBER	CANDIDATE NUMBER
COMPUTING	9691/23
Paper 2	May/June 2012
	2 hours

Candidates answer on the Question Paper.

No additional materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in. Write in dark blue or black pen. You may use a soft pencil for any diagrams, graphs or rough working. Do not use staples, paper clips, highlighters, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer all questions.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

This document consists of **13** printed pages and **3** blank pages.



www.papaCambridge.com Anna wants to find out about her fellow students' sporting activities. It will be part 1 Sports Studies coursework. She will ask questions online, so starts by designing a screen layout. The first for questions will ask for:

- student's first name •
- age (16,17,18 or 19)
- favourite sport
- whether student is a member of a sports club (yes/no)

(a) Draw a suitable screen layout.

[4]

(b) Justify the design of your screen layout in (a).

..... [3]

2

www.papacambridge.com (c) Several of the students are visually impaired. Describe the design issues that Anna should consider to ensure these students answer the questions online.

[2]

- (d) The responses from each student will be stored as a record consisting of the following fields:
 - FirstName
 - Age
 - FavouriteSport
 - ClubMember

Complete the following table. Only a single value should be given for the Field Size.

Field Name	Data Type	Field Size (bytes)
FirstName		
Age		
FavouriteSport		
ClubMember		

[8]

(e) Anna is to write a program to analyse the responses.

12
4
4 Anna is to write a program to analyse the responses. Using a SELECT/CASE construct write the pseudocode to count the number students for each age group who completed the questionnaire.
Using a SELECT/CASE construct write the pseudocode to count the number
students for each age group who completed the questionnaire.
REPEAT
READ next record
UNTIL no more student records [5]

422				
	5			
	5 The records will be held in a direct access file. Give four statements from a high-level programming language that may be used the file handling and explain what each does. Programming language	For iner's		
	Programming language	Se.co		
	1			
	2			
	3			
	4			

Mary Mary					
		6			
	She The Gin	6 a is developing her programming skills in string handling. is going to input one string. string contains letters and zero or more '*' characters in any positions. a wants to remove all the '*'s and output the letters in their original order. example: input "com*put**er*", the output is "computer"			
	•	<pre>input "com*put**er*", the output is "computer" input "hardware", the output is "hardware"</pre>			
	(a)	Using a high-level programming language, write the code to perform this task. (Ensure that you use meaningful variable names and lay the code out clearly.)			
		Programming language			
		Code			
		101			
		[8]			

		7 e writes this code as the function ChangeString because it will be used es. State the parameter of the function.	
	She time	e writes this code as the function ChangeString because it will be used es.	Camb
	(i)	State the parameter of the function.	
			[1]
	(ii)	Write the function header in the language you used in (a) .	
((iii)	State why Gina uses a function rather than a procedure.	[2]
	. ,		
			[1]

www.papaCambridge.com Liliane wants to write a program to play chess. She will represent the board of 3 squares, using the 2-dimensional array Board [8,8]. Each element of the array will need initialising to zero. Later, if a chess piece is on square, it will take a value of 1. She starts by writing pseudocode for the initialisation of a 4 x 4 board. This is easier to trace.

01	$RowNo \leftarrow 1$
02	WHILE RowNo < 4 DO
03	ColumnNo ← 1
04	WHILE ColumnNo < 4 DO
05	Board[RowNo,ColumnNo] ← 0
06	ColumnNo ← ColumnNo + 1
07	ENDWHILE
08	$RowNo \leftarrow RowNo + 1$
09	ENDWHILE

(a) To test this pseudocode she traces it until the first five elements of Board have been initialised.

Complete the headings and the trace for these first five elements of the array.

BowNo	ColumnNo	olumnNo RowNo<4	ColumnNo<4	Board				
ROWNO				[1,1]				
1	1	True	True	0				

8

		9 ror in the pseudocode. of error.	
		9	
(b)	There is an err	ror in the pseudocode.	For iner's
	State the type	of error.	ibride
		[1] Se.com
(c)	Rewrite two lir	nes that will make the pseudocode work as intended.	
	Line number	Pseudocode	
		[2	
(d)	State the coun	t-controlled loop that would be better for this initialisation.	
		[1]
(e)	On a full 8 x Board[8,1]	8 board, state the relative positions of the squares Board[1,8] and	t l
			.
		[1]

www.papaCambridge.com (f) Liliane's next task is to indicate that there are pieces occupying the first two rows 8 x 8 board. Each square in rows 1 and 2 will be given the value 1.

Draw a flowchart that shows how to do this, using loop structures and the variable names previously used (Board, RowNo, ColumnNo).

	11 hrvn p	
4	 11 Raul writes software for a palm oil processing plant. He wants to check his understandifferent arithmetic operators for a problem that he has to solve. (a) Evaluate the following expressions for Raul. (i) 7/4 	"Cal
	(a) Evaluate the following expressions for Raul.	
	(i) 7/4	
	(ii) 7 MOD 4	
	(iii) 7 DIV 4	[3]
	(b) Raul has Y litres of oil to put into drums. Each drum can hold X litres of oil.	
	Write expressions to calculate:	
	(i) the number of full drums	
		[1]
	(ii) the number of litres of oil left over	
		[1]
	(c) Explain the difference between the operators / and DIV.	
		[2]

5 Ramon is learning about recursion. He has designed a recursive function.

```
FUNCTION Something(Number)
IF Number = 7
THEN
Something ← 1
ELSE
Something ← Something(Number + 1) + Number
ENDIF
ENDFUNCTION
```

(a) Calculate the value returned by the function call Something (4). Show your working.

.....

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(b)	13 State what will happen if the function is called with Something (8).	For iner's
(c)	[1] State what would happen if the fourth line, 'Something ~ 1', was not present.	Se.com
(d)	[2] The same process could have been designed using a FOR loop. Write the pseudocode to do this.	
	[2]	



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