

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS General Certificate of Education Advanced Subsidiary Level and Advanced Level

	CANDIDATE NAME		
	CENTRE NUMBER	CANDIDATE NUMBER	
*			
2 0	COMPUTING		9691/23
2 2	Paper 2		May/June 2013
5			2 hours
4 4	Candidates ans	wer on the Question Paper.	
8 2		aterials are required.	
2			

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 12 printed pages.



[Turn over

1 Meena wants to develop a program to keep a record of her examination results. She will want to enter, sort and print out data which is stored as a file of records.

Each record will contain at least the following data:

- subject
- examination title
- level
- date sat
- mark

An example of an examination title is 'General Certificate of Education'. The DateSat field will contain only the month and year that the examination was taken. For all subjects the mark is between 0 and 100 inclusive. The level is 'O' or 'A'.

(a) Complete the table. Use a single value for the size.

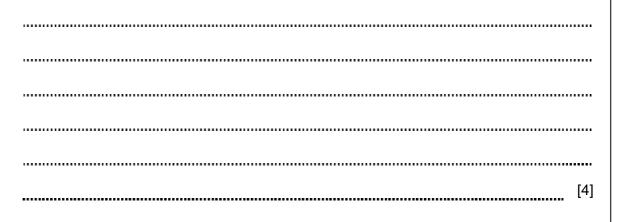
Data	ldentifier	Data Type	Size (in bytes)
subject	Subject	STRING	
examination title			
level	Level		1
date sat	DateSat		
mark	Mark		

[6]

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(b) Estimate how many records could be held in the file if there are 5KB available for the file.



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(c)	(i)	Each record needs another field to uniquely identify that record.	For	
		State an appropriate identifier for this field and state a suitable data type for it.	Examiner's Use	
		[2]		
	(ii)	In a programming language write the declaration for the record structure, giving it the identifier Exam.		
		Programming language		
		Declaration		
		[4]		
(d)	Me	ena decides to modularise the solution.		
		Describe two ways in which a procedural programming language is appropriate when modularising a solution.		
	1			
	2			
		[4]		

4

(e) Describe what the function EOF () does when used in a program.

[2]

- 2 The data in each field is validated as it is entered.
 - (a) Write the logic expression to validate Mark.

[3]

(b) The following table shows the four records currently stored in the file ExamResults for the examinations sat so far.

Subject	Title	Level	DateSat	Mark
Art Music Biology History	···· ··· ···	···· ··· ···	···· ··· ···	28 57 75 41

Meena will write a module based on the following pseudocode.

```
OPENFILE ExamResults FOR INPUT

Count ← 1

REPEAT

FILEREAD next ExamResults record

IF Mark > 70

THEN

Count ← Count + 1

ENDIF

UNTIL EOF()

OUTPUT Count

CLOSEFILE ExamResults
```

Output	Mark > 70	Mark	Count

(ii)	There is an error in the pseudocode.	
	Write the correct statement.	
		[1]
(iii)	State the type of error.	
		[1]
(iv)	Write a suitable comment that could be added to explain the line Count ← Count + 1.	
		[1]

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(i) Complete the trace table below using the file ExamResults.

(c)	The pseudocode given in (b) uses a REPEAT-UNTIL loop:

```
OPENFILE ExamResults FOR INPUT

Count ← 1

REPEAT

FILEREAD next ExamResults record

IF Mark > 70

THEN

Count ← Count + 1

ENDIF

UNTIL EOF()

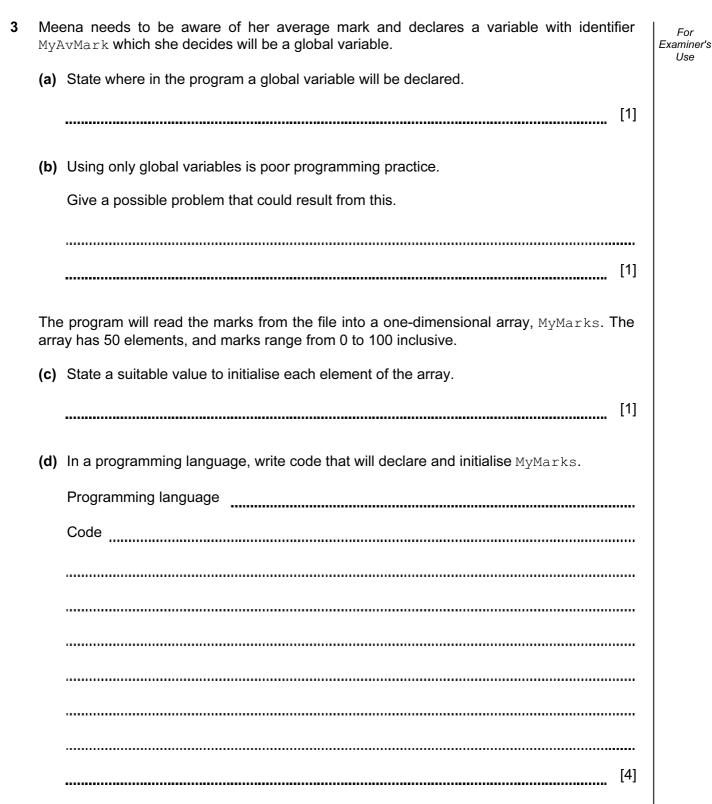
OUTPUT Count

CLOSEFILE ExamResults
```

Rewrite the pseudocode to count how many records have a mark below 40. This time use a WHILE-ENDWHILE loop.

OPENFILE ExamResults FOR INPUT

CLOSEFILE ExamResults [4]



(e) 20 marks have been read into elements 1 to 20. In a programming language, write code that will print out the highest and lowest marks that have been entered.

	Programming language
	Code
	[6]
)	MyAvMark is a variable of data type REAL. Meena wants the value of MyAvMark converted to the nearest whole number.
	State a function that will perform the conversion.
	[1]

The module to calculate the average mark could be written as a procedure or a function.

(g) (i) State one difference between a procedure and a function.

(ii) State why the module to calculate the average mark could be written as a procedure or a function.

•••••
 [2]

4 (a) Meena hopes some of her friends will use her program. When designing the user interface, state **three** design features she can incorporate if one of her friends has a sight impairment.

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[3]

(b) Design the interface. It must allow for entry of marks and the output of the average mark. Remember, one of her friends has a sight impairment.

[6]

(c)	Meena has compiled the program and she thinks it is working.	For Examiner's		
	What two types of error could still occur in the program? For each type give an example.			
	Error type 1			
	Example			
	Error type 2			
	Example			
	[4]			

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5	Meena wants to refine her program using the marks in MyMarks. She wants the program to output:	For Examiner's Use
	 the word 'Failed' if the mark is less than 40, the word 'Distinction' if the mark is over 70, the phrase 'Well done' if there are more than three distinctions. 	
	Using pseudocode, produce the algorithm that does this.	
	[9]	

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