



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS General Certificate of Education

	UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS General Certificate of Education Advanced Subsidiary Level and Advanced Level
CANDIDATE NAME	
CENTRE NUMBER	CANDIDATE NUMBER

COMPUTING 9691/22

Paper 2 October/November 2013

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.



- onuses I For iner's
- **1** Jemma is designing a program that will work out the end of year bonuses employees. The main steps are:
 - input employee's data
 - calculate the bonus
 - calculate deductions
 - o tax
 - o optional contribution to charity
 - print out the bonus
 - (a) Draw a structure diagram to show the modules that will be needed.

(b) Each module is programmed by Jemma.

Describe t	three	program	coding	techniques	she	should	use	to	help	Freddie	who
maintain th	he cod	te.									

Each module is programmed by Jemma. Describe three program coding techniques she should use to help Freddie who want maintain the code. Technique 1	
3	
Each module is programmed by Jemma.	For pipor's
Describe three program coding techniques she should use to help Freddie who w maintain the code.	Tide
Technique 1	COM
	l l
Technique 2	
Technique 3	
[6]	

[2]

(c)	(i)	Jemma is using the variable Percentage in one module and a different valled Percentage in another module.
		Explain the feature of a high-level programming language that avoids any possible conflict.
		[2]
	(ii)	Some modules require data values that originate from another module.
		Explain the feature of a high-level programming language that enables this.

- (d) Jemma is designing a range validation check for the input of an employee's pa pay range depends on the employee's job type, which may be P(part-time), F(full-n or C(commission only).
- www.PapaCambridge.com
 - A part-time employee will earn between \$100 and \$10000 a year. A full-time employee will earn between \$5000 and \$50000 a year.
 - A commission only employee will earn between \$0 and \$80 000 a year.

Complete the table showing five more rows of test data. Give a different reason for each, describing what is being tested.

Job type	Pay	Reason
F	25 000	Normal data – within pay range for full-time

[5]

2 James plans to store the titles and authors of his favourite ebooks in an array. He ebooks at the moment and expects to reach 150.

		The state of the s
		6 AM. Pall
		lans to store the titles and authors of his favourite ebooks in an array. He at the moment and expects to reach 150. mensional array MyEbooks is to be used. high-level programming language, write the array declaration statement.
A t	vo-di	mensional array MyEbooks is to be used.
(a)	In a	high-level programming language, write the array declaration statement.
	Prog	gramming language
	Dec	laration [3]
(b)	(i)	Why is it good programming practice to initialise the array MyEbooks?
		[1]
	(ii)	Write program code to initialise the array MyEbooks.
		Programming language
		Code
		[3]
(c)	At p	resent when the program terminates all the ebook data are lost.
	How	can these data be stored and made available every time the program is run?
		[3]

each of her	7 nd, Jatinder, uses his idea, be ebooks. e following table. Use a single	ut decides to store m	
Identifier	Description	Data type	Field size (Bytes)
EbookID	a unique ebook ID, a whole number between 1 and 500		
BookTitle	the title of the ebook	STRING	
Author	the author of the ebook		
DateBought	date bought		
Cost	price paid		
Fiction	fiction or non-fiction		

[8]

www.PapaCambridge.com 3 Aisha wants to write a program that checks the password to her personal compute program should check each attempt to enter the password correctly and should terminate after three wrong attempts.

She wants the log-in screen to display:

- a prompt to enter the password
- space to enter the password
- how many attempts have been made
- if the log-in has been successful or not
- a means of cancelling the log-in process
- (a) Draw a suitable layout for the screen.

Aisha's log-in screen	

Aisha writes her first try at designing the code in pseudocode. She wants the password to be "Aisha", her name.

```
Attempt \leftarrow 0
 2
     REPEAT
 3
         INPUT Password
         Attempt \leftarrow Attempt + 1
 5
     UNTIL (Password = "Aisha") OR (Attempt > 3)
 6
     IF Password = "Aisha"
 7
         THEN
 8
             OUTPUT "Password correct"
 9
         ELSE
10
             OUTPUT "No valid password entered"
11
     ENDIF
```

[5]

(b) (i) Co	omplete the tra	ace table usin	9 g "Aisha" as	input.	NAMA, PARACE	For
Attempt	Password	Password = "Aisha"	Attempt > 3	Password = "Aisha" OR Attempt > 3	Output	Monide iner's
0						6.0
	Aisha					
			_]
						1
						7
						-

[3]

(ii) Complete the trace table using the following sequence of inputs:

"aisha", "Asha", "AISHA"

Attempt	Password	Password	Attempt	Password = "Aisha"	Output	
-		= "Aisha"	> 3	OR Attempt > 3	_	
0						

(c)	Thi	s piece of code does not do what Aisha intended. There is an error.	Car
	(i)	State the type of error.	7br
			[1]
	(ii)	There are several ways to correct this. One is to change line 5.	
		Rewrite line 5.	
			[1]
(d)	Sta	te why someone's name is not a good password.	
			[1]
(e)	Des	scribe how to choose a more secure password.	
			[2]

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Question 3 continues on page 12.

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www.PapaCambridge.com **(f)** Having entered a correct password, Aisha wants to present a menu screen. The user is to enter a number between 1 and 4 to make a choice.

- Option 1 email
- Option 2 social network
- Option 3 schoolwork
- Option 4 favourite websites

The number entered is to be stored in a variable, Choice. Each option calls an appropriate procedure.

- (i) Write program code which
 - inputs the user's choice,
 - validates this choice,
 - uses nested IF statements to call the appropriate procedure.

Programming language
Code
[6]
[0]

	Mary Mary	
	13	
(ii)	Rewrite your IF statements using a CASE/SELECT statement to implement options.	For iner's
		S. COM

[4]

www.PapaCambridge.com Aisha writes the following pseudocode for a recursive function that works out the g common divisor of two positive integers:

```
FUNCTION Divisor(x, y)
1
          IF y = 0
2
              THEN
                  RETURN x
3
4
              ELSE
5
                  x \leftarrow x \text{ MOD } y
6
                  RETURN Divisor(y, x)
7
          ENDIF
8
      ENDFUNCTION
```

(a) (i) Trace the call Divisor (8, 2).

Line number	х	У	RETURN
0	8	2	

(ii) Trace the call Divisor (38, 7).

Line number	x	У	RETURN
0	38	7	

[2]

(b)	(i)	State the purpose of line 1.	For viner's
			e.com
	(ii)	State what would happen if line 1 were not present.	
		[1]	
(c)	Wh	hat happens if x is less than y ?	
		[3]	

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