

THE UNIVERSITY OF AUCKLAND

SUMMER SEMESTER, 2010

Campus: City

COMPUTER SCIENCE

Mastering Cyberspace: An Introduction to Practical Computing

(Time Allowed: TWO hours)

NOTE:

You must answer **all** questions in this exam.

No calculators are permitted

Write your answers in the space provided.

There is space at the back for answers that overflow the allotted space.

Surname	
Forenames	
Student ID	
Login (UPI)	

	Question	Mark	Out Of
1	Hardware and Software		15
2	Internet		15
3	Programming using Python		12
4	Spreadsheets		13
5	XHTML and CSS		12
6	Databases		13
7	LaTeX		12
8	AI and Social Issues		8
TOTAL			100

CONTINUED

1. Hardware and Software (15 marks)

(a) What does RAM stand for?

(2 marks)

(b) What does Moore's Law state?

(2 marks)

(c) Give two examples of expansion cards.

(i)

(ii)

(2 marks)

(d) Name three operating systems.

<p>(i)</p> <p>(ii)</p> <p>(iii)</p>

(3 marks)

(e) What is shareware?

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(2 marks)

(f) Give an example of a file extension (e.g. txt for text documents) for each of the following file types: image, video, sound, program.

<p>Image:</p> <p>Video:</p> <p>Sound:</p> <p>Program:</p>

(4 marks)

2. Internet (15 marks)

(a) What does the IP in TCP/IP stand for?

(2 marks)

(b) What does the TCP protocol take care of?

(3 marks)

(c) Give three locations that log a user's web page access.

(i)

(ii)

(iii)

(3 marks)

(d) How does hypertext differ from plain text?

(2 marks)

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(e) Who started the World Wide Web project at CERN?

(2 marks)

(f) When sending emails, what is the BCC field used for?

(3 marks)

CONTINUED

3. Programming using Python (12 marks)

- (a) Write a program that asks the user to enter a price. If the price is lower than 10, the program should then add GST and print "GST added". For prices greater than or equal to 10, the program should print "No GST added". Finally, the program should print the new price.

To add GST, multiply the original price by 1.125.

For example, if the user enters 4 as the price, the output that is expected from your program is shown below:

```
Enter the price: 4
GST added
Final price 4.5
```

(6 marks)

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- (b) Complete the output produced by the following program when the user enters **12** at the prompt.

```
number = int(input("Please enter a number: "))

place = 8
count = 3

print("Computing...")
while count >= 0:
    value = 0
    if place <= number:
        value = 1
        number = number - place
    print(place, "s: ", value)
    place = place // 2
    count = count - 1
```

Please enter a number: **12**

(6 marks)

CONTINUED

4. Spreadsheets (13 marks)

Questions (a) to (c) refer to the spreadsheet shown below. The table lists orders placed at an online retailer. Customers whose total price is more than \$20 receive goods at a discounted rate.

	A	B	C	D	E	F	G	H	
1									
2			Discounted Rate:		80.00%				
3									
4									
5			Order	Customer	Item Price	Quantity	Total Price	Discount?	Cost
6			9530	Amy	\$12.00	2	\$24.00	Yes	\$19.20
7			5732	Brett	\$10.00	1	\$10.00	No	\$10.00
8			9852	Carl	\$24.00	1	\$24.00	Yes	\$19.20
9			2340	Donna	\$9.00	4	\$36.00	Yes	\$28.80
10			6341	Eve	\$12.00	2	\$24.00	Yes	\$19.20
11			8093	Frank	\$1.00	10	\$10.00	No	\$10.00
12									
13							Total:	\$106.40	

(a) What is the **best** formula to use in cell F6? The formula must be able to be filled down.

(2 marks)

(b) What is the **best** formula to use in cell H13?

(2 marks)

(c) Cell H6 gives the cost of the order after discounting. If G6 is “Yes”, then this is the total price in F6 multiplied by the discounted rate in E2. Otherwise this is just the value in F6.

What is the **best** formula to use in cell H6? The formula must be able to be filled down.

(3 marks)

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Questions (d) and (e) refer to the spreadsheet shown below.

	B	C
3	Sunshine Hours	
4	London	1500
5	Dunedin	1600
6	Hamilton	2000
7	Christchurch	2050
8	Wellington	2050
9	Auckland	2050
10	Nelson	2400
11	San Francisco	2950

	A	B	C	D
13				
14	Manufacturer	Location	Sunshine	Area
15	Sopogy	Wellington	2050	250
16	Sunrisco Ind.	San Francisco	2950	1100
17	Neosunergy	London	1500	800
18	Bright Senergy	San Francisco	2050	750

(d) Cell C15 looks up the number of sunshine hours per year for the city given in B15.

What is the **best** formula to use in cell C15? The formula must use a VLOOKUP function to get the appropriate value from the table in cells B4:C11, and must be able to be filled down.

(4 marks)

(e) Why is it not appropriate to set the range_lookup to TRUE in the VLOOKUP formula of part (d) above?

(2 marks)

5. XHTML and CSS (12 marks)

The screenshot below on the left shows a web page created using XHTML 1.0 strict and Cascading Style Sheets.

The external style sheet that defines the styles used on this page is stored in a file called "style.css". The contents of the file style.css is shown below on the right.

The image is stored as "flowers.png" in the same directory as the XHTML file. The tooltip "arranged" is shown as alternate text for the image.



```
body{
    font-family:sans-serif;
}

h1{
    border-bottom-width:thick;
    border-bottom-style:double;
}

h2{
    background-color:gray;
    text-align:center;
}

dt{
    font-weight:bold;
}

dd{
    font-style:italic;
}

table{
    border-style:solid;
}

.thinBorder{
    border-style:solid;
    border-width:thin;
}
```

Complete the XHTML code on the next page so that it produces the output shown in the screenshot above. You **must** use the styles defined in the style.css external style sheet and may not define any new styles.

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```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE html PUBLIC
"-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" lang="en">
  <head>
    <link rel="stylesheet" href="style.css" type="text/css"></link>
    <title>Flowers</title>

  </head>
  <body>
```

```
</body>
</html>
```

(12 marks)

CONTINUED

6. Databases (13 marks)

(a) What is a Database Management System (DBMS)?

(2 marks)

(b) What is a primary key?

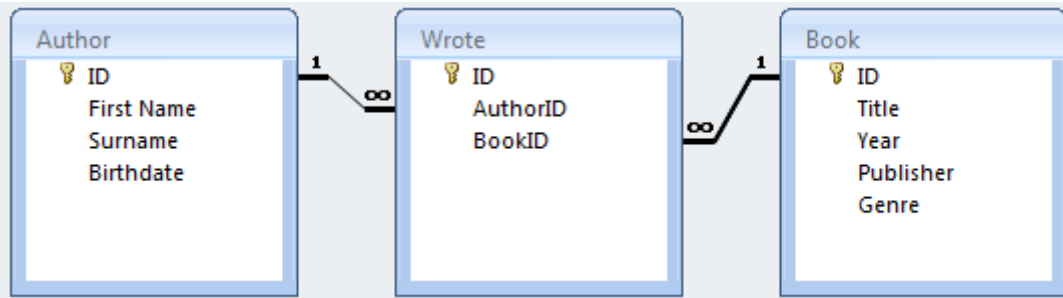
(2 marks)

(c) What is a foreign key?

(2 marks)

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The following relationship diagram is used in questions (d) to (f):



(d) Name one foreign key in the database above.

(2 marks)

(e) What is the type of relationship (e.g. one-to-one, one-to-many, many-to-one) between the Author table and the Wrote table?

(2 marks)

(f) Give an SQL statement that displays the title of all books written before 1990.

(3 marks)

7. LaTeX (12 marks)

Write the LaTeX code that will produce the following output:

1 Flowers

1.1 Structure

The floral formulae:

- *Tulip's* structure is $P^3 A^3 G^3$
- *Buttercup's* structure is $K^5 C^5 A^\infty G^\infty$

1.2 Arranging

The number of ways of arranging a circle of n flowers is

$$P_n = \frac{1}{2}(n! - 1) \quad (1)$$

The following commands have been included as a reference. You will not need to use all of these commands. Note that the basic document structure has been completed for you.

<i>Normal commands</i>	<i>Environments</i>	<i>Math mode commands</i>
<code>\emph{}</code>	<code>itemize</code>	<code>\sum_{ }^{ }</code>
<code>\section{}</code>	<code>enumerate</code>	<code>\frac{ }{ }</code>
<code>\subsection{}</code>	<code>verbatim</code>	<code>\sqrt{ }</code>
<code>\large</code>	<code>flushright</code>	<code>\geq</code>
<code>\textbf{ }</code>	<code>center</code>	<code>\pi</code>
<code>\title{ }</code>	<code>quote</code>	<code>\infty</code>
<code>\author{ }</code>	<code>displaymath</code>	<code>^</code>
<code>\date{ }</code>	<code>equation</code>	<code>-</code>
<code>\maketitle</code>		
<code>\item</code>		

```
\documentclass[a4paper]{article}
\begin{document}
```

ID.....

\end{document}

(12 marks)

CONTINUED

8. Artificial Intelligence and Social Issues (8 marks)

(a) What is an expert system?

(2 marks)

(b) Is a program that is able to play chess more likely to be considered strong AI or weak AI? Explain why.

(2 marks)

(c) In terms of malicious software, what is a worm?

(2 marks)

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(d) Name two approaches used in software for restricting children's access to unsuitable content on the web.

<p>(i)</p> <p>(ii)</p>

(2 marks)

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- Overflow Sheet 1 -

Write the question number and letter next to your answer. You must ALSO indicate in the allotted space that you have used the overflow sheet.

ID.....

- Overflow Sheet 2 -

Write the question number and letter next to your answer. You must ALSO indicate in the allotted space that you have used the overflow sheet.

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- Overflow Sheet 3 -

Write the question number and letter next to your answer. You must ALSO indicate in the allotted space that you have used the overflow sheet

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