THE UNIVERSITY OF AUCKLAND

FIRST SEMESTER, 2010
Campus: City / Epsom

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
Answer Section A (Multiple choice questions) on the Teleform answer sheet provided.
Answer Section B in the space provided in this booklet.
There is space at the back for answers that overflow the allotted space.

Surname	*Sample*
Forenames	*Answers*
Student ID	
Login (UPI)	

	Question	Mark	Out Of
1 - 15	Multiple Choice		30
16	Programming using Python		14
17	Spreadsheets		14
18	Databases		14
19	LaTeX		14
20	XHTML and CSS		14
	TOTAL	**100**	100

SECTION A

MULTIPLE CHOICE QUESTIONS

Each question in this section is worth **2 marks**. There is only **one** correct answer for each question. Select your preferred alternative on the Teleform answer sheet provided by shading in the appropriate box.

Question 1
[2 marks] In PowerPoint, what is a master slide?

    (a) A slide that contains information such as author and creation date
    (b) A slide that determines the appearance of other slides
    (c) The last slide of a presentation
    (d) The first slide of a presentation
    (e) A slide that controls the transitions between the other slides

Question 2
[2 marks] Which of the following suggestions should you always apply to your PowerPoint presentations?

    (a) Don't put every word that you say on the slide
    (b) Animate all transitions between slides
    (c) Use multiple fonts on every slide
    (d) Don't put any words that you say on the slide
    (e) Use long rather than short sentences on slides

Question 3
[2 marks] Which two people started Apple Computer, Inc.?

    (a) Steve Jobs and Steve Wozniak
    (b) Bill Gates and Paul Allen
    (c) Steve Jobs and Eric Roberts
    (d) Bill Gates and Steve Jobs
    (e) Steve Jobs and Steve Allen

Question 4
[2 marks] Where was the original development work for Graphical User Interfaces and WYSIWYG done?

    (a) Xerox's Palo Alto Research Centre (PARC)
    (b) IBM Research, Almaden
    (c) Adobe Inc. Technology Labs, San Jose
    (d) Apple Computer Inc., Cupertino
    (e) Microsoft Research Lab, Seattle

Question 5

[2 marks] What historical event led to the production of the electronic digital computers Colossus and ENIAC?

    (a) The Cold War
    (b) The American Civil War
    (c) World War II
    (d) The Space Race
    (e) The Great Depression

Question 6

[2 marks] Which of the following computers was the first commercially available personal computer?

    (a) Commodore 64
    (b) Apple I
    (c) IBM PC
    (d) Apple II
    (e) Altair 8800

Question 7

[2 marks] Which of the following statements about the Internet is **false**?

    (a) It is easy to impersonate other people
    (b) Privacy may be violated
    (c) Some social groups have difficulty getting access
    (d) Anybody can edit anything on the Internet
    (e) Credit card numbers are frequently stolen

Question 8

[2 marks] Which of the following statements about parents controlling their children's access to the Internet is **false**?

    (a) Blocking software can be used to only allow access to white list addresses
    (b) Filtering can be done on the home computer, by the ISP or by other web companies
    (c) Filtering software can block sites which contain certain words, phrases or images
    (d) Blocking and filtering software can be 100% effective
    (e) Blocking software can be used to prevent access to black list addresses

Question 9

[2 marks] What is a logic bomb?

    (a) A deliberate error left in a program
    (b) A logical problem that requires enormous computing power
    (c) A virus that crashes a computer
    (d) Hardware which explodes when used incorrectly
    (e) A mathematical mistake in a program

Question 10

[2 marks] What is a Trojan Horse?

    (a) A virus which spreads very quickly
    (b) A program with lots of bugs in it
    (c) A malicious program disguised as good software
    (d) A computer without a CPU
    (e) A type of super computer

Question 11

[2 marks] What did the Therac-25 case involve?

    (a) The computer program which almost caused the third World War
    (b) The chess program which beat Kasparov (the world champion)
    (c) The secret control codes which were used to blow up an oil pipeline in Western Russia
    (d) A radiation therapy machine which caused injury and death because of software and user error
    (e) A rocket that exploded due to conversion errors from floating point to integer

Question 12

[2 marks] What was the Internet Worm?

    (a) A program that encrypted hard drives connected to the Internet and held the data for ransom
    (b) A super computer that was able to connect to thousands of Internet sites simultaneously
    (c) A program which overwrote large sections of Wikipedia in 2004
    (d) An email hoax that was sent to thousands of people damaging their computers
    (e) A self-replicating program that brought down large parts of the Internet

Question 13

[2 marks] Which statement about the Turing Test is true?

    (a) If a test machine mistakes another machine for a human, it fails the test
    (b) A machine has to determine the IQ of a human tester
    (c) A human tester has to decide whether he is communicating with a machine or a human
    (d) The Turing Test was first passed in 2003
    (e) If a human tester cannot distinguish between a human and a machine, the tester fails the test

Question 14

[2 marks] What is the Chinese Room?

    (a) A thought experiment that is used to argue against strong AI
    (b) A room with machines to carry out experiments in AI
    (c) An experiment that shows that AI programs can truly understand Chinese
    (d) A room that was built to show that machines can understand Chinese
    (e) A machine in a room that translates English into Chinese

Question 15

[2 marks] Which of the following is a significant problem for AI?

    (a) Logic bombs
    (b) Broken hardware
    (c) Infinite loops
    (d) Combinatorial explosion
    (e) Syntax errors

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SECTION B

Answer all questions in this section in the space provided. If you run out of space then please use the Overflow Sheet and indicate in the allotted space that you have used the Overflow Sheet.

16. Programming Using Python (14 marks)

(a) Show the output from the following program. Show each space in the output with the "^" character.

```
print "Hello"
print 2 + 2, "is the answer to 2 + 2"
herName = "Alice"
hisName = "Bob"
print herName + hisName
```

Hello
4^is^the^answer^to^2^+^2
AliceBob

(3 marks)

CONTINUED

(b) Write a Python program which asks the user when they first started at university and it displays a message informing the user how many years ago they first enrolled as in the following examples:

Example 1:
```
What year did you start university? 1977
You first enrolled 33 years ago.
```

Example 2:
```
What year did you start university? 2010
You first enrolled 0 years ago.
```

```python
year = input("What year did you start university? "
yearsAgo = 2010 - year
print "You first enrolled", yearsAgo, "years ago."
```

(3 marks)

(c) Show the output from the following program.

```python
total = 0
number = 1
while number < 4:
    print number
    total = total + number
    number = number + 1
print "The total is", total
```

```
1
2
3
The total is 6
```

(4 marks)

CONTINUED

(d) Write a Python program which repeatedly asks the user to enter a number until they enter the number 7.
If the number they enter is not 7 the program displays "**Try again**".
The program displays "**Got it!**" and finishes when the user enters 7.
Your program should work as in the following example.

```
Enter a number: 2
Try again
Enter a number: 5
Try again
Enter a number: 8
Try again
Enter a number: 7
Got it!
```

```python
number = input("Enter a number: ")
while number != 7:
    print "Try again"
    number = input("Enter a number: ")
print "Got it!"
```

(4 marks)

CONTINUED

17. Spreadsheets (14 marks)

The following Microsoft Excel spreadsheet is used for entering new video rental transactions. Entering a new transaction involves

- Locating the customer in the Customers table and retrieving the discounted rate of the customer.
- Locating the video information in the Movies table using the ID.
- Calculating the total of the transaction.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Customers:						Movies:					
2	ID	Firstname	Surname	Address	Discounted Rate		ID	Title	Rental Price	Length	Rating	Year
3	HSIMP001	Homer	Simpson	742 Evergreen Te	0.9		1	101 Dalmatians	2.00	76	G	1961
4	PFRY001	Philip	Fry	Planet Express O	0.8		2	101 Dalmatians	2.00	73	G	1996
5	PGRIF001	Peter	Griffin	31 Spooner Stree	0.85		3	101 Dalmatians II	3.00	71	G	2003
6							4	The Spectacular S	4.00	67	PG	2008
7							5	The WotWots - Sno	5.00	80	G	2009
8							6	Roary The Racing (	4.00	70	G	2007
9							7	Up	5.00	92	PG	2009
10							8	WALL-E	4.00	98	G	2008
11							9	Lord Of The Rings:	4.00	192	M	2003
12							10	Indiana Jones And	3.00	111	PG	1981
13	Invoice:						11	Twilight	4.00	121	M	2008
14	Customer:	HSIMP001	Order Date:	10/05/2009								
15	Discounted Rate:	0.9										
16												
17	ID	Title	Rental Price	Member Price								
18	4	The Spectacular S	4.00	3.60								
19	5	The WotWots - Sn	5.00	4.50								
20	8	WALL-E	4.00	3.60								
21	7	Up	5.00	4.50								
22			Total	16.20								
23												

(a) What is the best formula to use in Cell B15? Your formula should look up the customer details in the Customers table for the ID in Cell B14 and retrieve the discounted rate for the customer. The table to search for the discounted rate is given in the top left corner of the spreadsheet.

The syntax of the **vlookup** function to search the first column of a table, and then return a value from any cell on the same row of the table is given below:

    vlookup(lookup_value, table_array, col_index_num,[range_lookup])

=vlookup(B14,$A$3:$E$5,5,false)

(3 marks)

(b) What is the best formula to use in Cell B18? Your formula should use Cell A18 to look up the movie from the Movies table and retrieve the title of the movie. Note: You must ensure that your formula is able to be filled down.

The table to search for the movie is given in the top right corner of the spreadsheet.

```
=vlookup(A18,$G$3:$L$13,2,false)
```

(3 marks)

(c) What is the best formula to use in Cell D18? Your formula should calculate the member price by multiplying the rental price in Cell C18 by the discounted rate in Cell B15. **Note:** You must ensure that your formula is able to be filled down.

```
=C18 * $B$15
```

(4 marks)

(d) What is the best formula to use in Cell D22? Your formula should calculate the total price of the rental transaction.

```
=sum(D18:D21)
```

(4 marks)

18. Databases (14 marks)

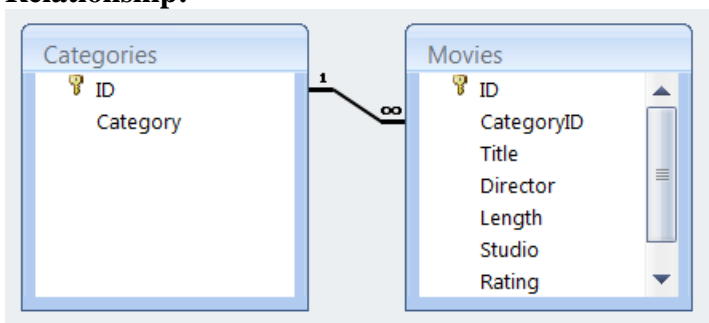Given the following Microsoft Access tables and relationship diagram:

Table: Categories

	ID	Category
+	1	Action & Adventure
+	2	Children & Family
+	3	Comedy
+	4	Drama
+	5	Horror
+	6	Music
+	7	Romance
+	8	Sports
*	(New)	

Table: Movies

ID	CategoryID	Title	Director	Length	Studio	Rating
1	2	101 Dalmatians	Stephen Herel	76	Disney	G
2	2	101 Dalmatians	Stephen Herel	73	Disney	G
3	2	101 Dalmatians II: Patch's London Adv	Jim Kammeru	71	Walt Dis	G
4	2	The Spectacular Spider-Man		67		PG
5	2	The WotWots - Sneak-a-Peak, A Flami		80	ABC For	G
6	2	Roary The Racing Car - Vol 2: Roary Ta		70		G
7	2	Up	Peter Docter	92	Disney	PG
8	2	WALL-E	Andrew Stant	98	Disney	G
9	1	Lord Of The Rings: The Return Of The	Peter Jackson	192	New Lin	M
10	1	Indiana Jones And The Raiders Of The	Steven Spielbe	111	Paramou	PG
11	5	Twilight	Catherine Har	121		M

Relationship:

Categories: ID (key), Category — 1 to ∞ — Movies: ID (key), CategoryID, Title, Director, Length, Studio, Rating

(a) What is the **primary** key of the **Categories** table?

ID

(2 marks)

(b) What is the **primary** key of the **Movies** table?

ID

(2 marks)

(c) What is the **foreign** key of the **Movies** table?

CategoryID

(2 marks)

(d) What is an appropriate **data type** for the **Rating** field of the **Movies** table?

Text

(2 marks)

(e) What is an appropriate **data type** for the **Length** field of the **Movies** table?

Number

(2 marks)

(f) What is the SQL statement to display **ID** and **Title** from the **Movies** table where the length of the film is less than 90 minutes?

The expected output is shown as below:

ID	Title
1	101 Dalmatians
2	101 Dalmatians
3	101 Dalmatians II: Patch's London Adventure
4	The Spectacular Spider-Man
5	The WotWots - Sneak-a-Peak, A Flamingo
6	Roary The Racing Car - Vol 2: Roary Takes Off

SELECT **ID, Title**

FROM **Movies**

WHERE **Length < 90**;

(2 marks)

CONTINUED

(g) What is the SQL statement to display only **Title** from the **Movies** table where the movie is suitable for General Audience (G)?

The expected output is shown as below:

Title
101 Dalmatians
101 Dalmatians
101 Dalmatians II: Patch's London Adventure
The WotWots - Sneak-a-Peak, A Flamingo
Roary The Racing Car - Vol 2: Roary Takes Off
WALL-E

```
SELECT Title

FROM Movies

WHERE Rating = "G";
```
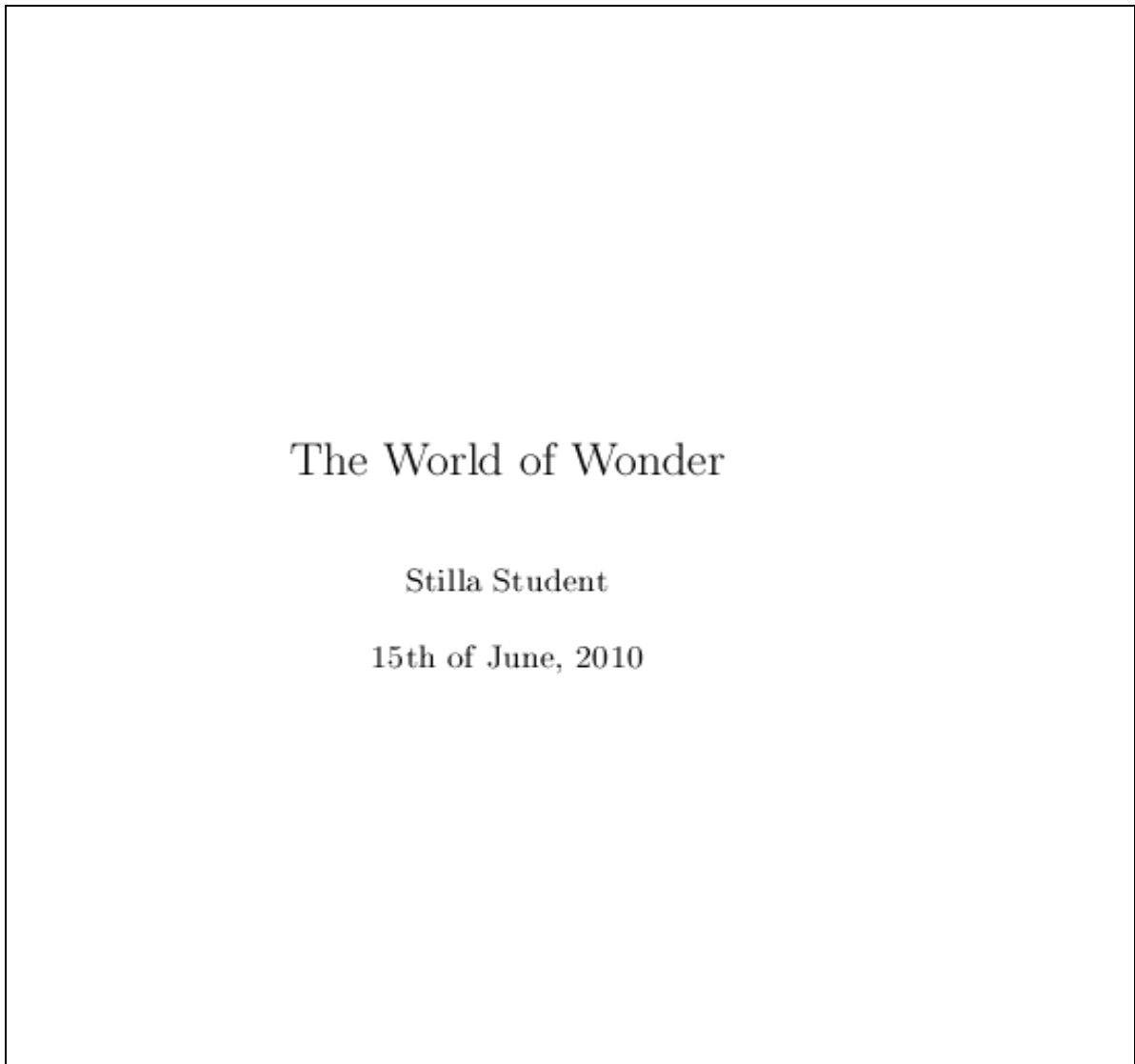
(2 marks)

CONTINUED

19. LaTeX (14 marks)

(a) Draw the **first** page which would be generated by the following LaTeX code.

```
\documentclass[a4paper]{book}

\begin{document}
\title{The World of Wonder}
\date{15th of June, 2010}
\author{Stilla Student}
\maketitle

The world is a wonderful place.

\end{document}
```


<div style="border:1px solid black; text-align:center;">

The World of Wonder

Stilla Student

15th of June, 2010

</div>

(4 marks)

(b) Write the LaTeX code that will produce the following output:

<div style="border:1px solid black; padding:1em;">

Exam Question

S1 2010

1   Quadratic Equations

Quadratic equations can be solved by:

- factorization
- the quadratic formula

1.1   The Quadratic Formula

The *quadratic formula* for one solution of the **quadratic equation** $y = ax^2 + bx + c$ is:

$$x = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$$

</div>

The following LaTeX 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.

Normal commands	Environments	Math mode commands
\emph{}	itemize	\sum_{}^{}
\section{}	enumerate	\frac{}{}
\subsection{}	verbatim	\sqrt{}
\large	flushright	\geq
\textbf{}	center	\pi
\title{}	quote	\ldots
\author{}	displaymath	
\date{}	equation	^
\maketitle	quotation	
\item		_

CONTINUED

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

\title{Exam Question}
\date{S1 2010}
\maketitle

\section{Quadratic Equations}
Quadratic equations can be solved by:
\begin{itemize}
    \item factorization
    \item the quadratic formula
\end{itemize}
\subsection{The Quadratic Formula}
The \emph{quadratic formula} for one solution
of the \textbf{quadratic equation} $y = ax^2
+ bx +c$ is:
\begin{displaymath}
x = \frac{-b + \sqrt{b^2 - 4ac}}{2a}
\end{displaymath}

\end{document}
```
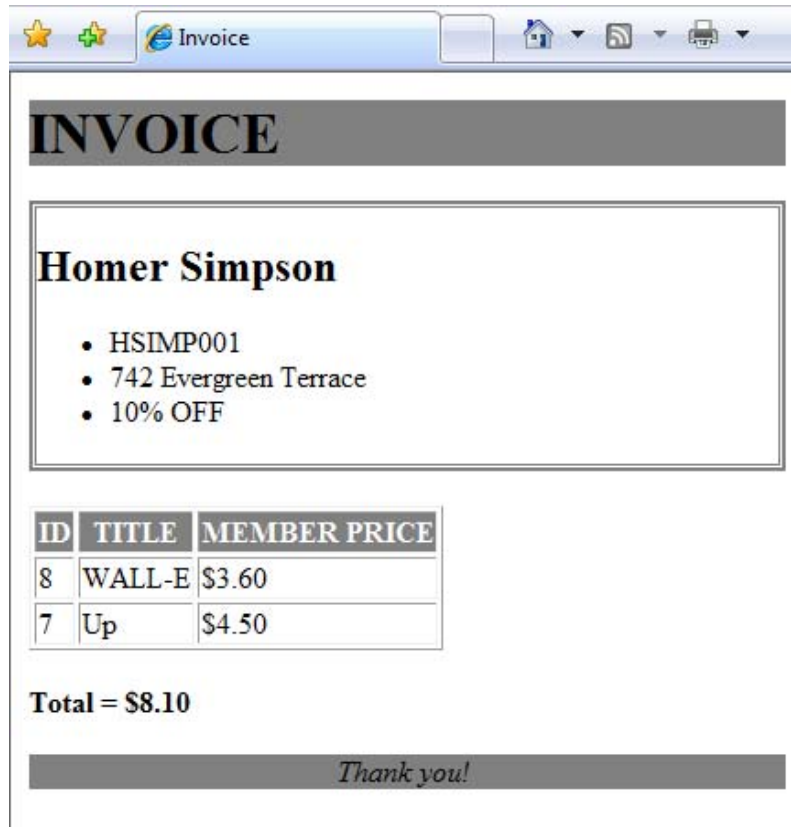
(10 marks)

20. XHTML and CSS (14 marks)

The following screenshot shows a web page created using XHTML 1.0 strict and Cascading Style Sheets:

Complete the XHTML code below so that it produces the output shown above. You **must** use the styles defined in the internal style sheet in the head section below, and **must not** define any new styles.

```
<?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>
<title>Invoice</title>
<style type="text/css">
h1 {
    background-color: gray;
    text-transform: uppercase;
}
.custInfo {
    border-color: gray;
    border-style: double;
    border-width: medium;
}
.totalPrice {
    font-weight: bold;
}
```

```
th {
    background-color: gray;
    color: white;
    text-transform: uppercase;
}

#footer {
    background-color: gray;
    text-align: center;
    font-style: italic;
}
</style>
</head>

<body>
```

```
<!-- Display the heading -->

        <h1>Invoice</h1>
```

(1 mark)

```
<div class="custInfo">
```

```
<!-- Display the Customer details -->

    <h2>Homer Simpson</h2>

     <ul>

        <li>HSIMP001</li>

        <li>742 Evergreen Terrace</li>

        <li>10% OFF</li>

     </ul>
```

(5 marks)

```
</div>
<p></p>
<table border="1">
    <tr>
        <th>ID</th>   <th>Title</th>   <th>Member Price</th>
    </tr>
```

```
        <!-- Display the table details -->
<tr>

    <td>8</td> <td>WALL-E</td> <td>$3.60</td>

</tr>

<tr>

    <td>7</td>   <td>Up</td>   <td>$4.50</td>

</tr>
```

(4 marks)

```
    </table>
```

CONTINUED

```html
<!-- Display the total -->

      <p class = "totalPrice">

          Total = $8.10

      </p>
```

(2 marks)

```html
<!-- Display the footer -->

      <p id = "footer">

          Thank you!

      </p>
```

(2 marks)

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

- 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.**

- 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.

Rough Working – This page will not be marked

Rough Working – This page will not be marked

Rough Working – This page will not be marked