

THE UNIVERSITY OF AUCKLAND

FIRST SEMESTER, 2013
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

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	<i>Sample</i>
Forenames	<i>Solutions</i>
Student ID	
Login (UPI)	

	Question	Mark	Out Of
1 - 25	Multiple Choice		50
26	Programming using Python		10
27	Spreadsheets		10
28	Databases		10
29	LaTeX		10
30	XHTML and CSS		10
	TOTAL		100

SECTION A**MULTIPLE CHOICE QUESTIONS**

Each question in this section is worth **2 marks**. There is only **one** correct answer for each question. For each question, choose the **best** answer according to the information presented in lectures. Select your preferred answer on the Teleform answer sheet provided by shading in the appropriate box.

Question 1

[2 marks] Which of the following statements about TCP is FALSE?

- (a) TCP divides the message into packets.
- (b) TCP combines packets to reform the message.
- (c) TCP defines routing information.**
- (d) TCP checks that all packets arrive.

Question 2

[2 marks] Which of the following statements about packet switching networks is FALSE?

- (a) In packet switching networks, each packet is sent independently.
- (b) In packet switching networks, messages are broken into packets.
- (c) In packet switching networks, nodes can route data packages efficiently to their destination.
- (d) Packet switching is best for real-time data.**

Question 3

[2 marks] Which of the following statements about forums is FALSE?

- (a) Forums are used to distribute spyware.**
- (b) Forums are organised as messages with replies (topics).
- (c) The moderator of a forum has the ability to edit, delete, and move messages.
- (d) Forums are a form of asynchronous communication.

Question 4

[2 marks] Which of the following statements about email is FALSE?

- (a) Email is a form of asynchronous communication.
- (b) Email can be used to send files as attachments.
- (c) It is illegal to read other people's email.**
- (d) Email can be used to distribute spyware, malware, and viruses.

Question 5

[2 marks] Which of the following statements about wikis is FALSE?

- (a) In wikis, only those with appropriate access can edit a page.
- (b) A wiki was described by the developer as “the simplest online database that could possibly work”.
- (c) A wiki allows a content pool to be created that can be easily edited.
- (d) In wikis, posts are displayed in reverse chronological order.**

Question 6

[2 marks] Which of the following statements about web browsers is FALSE?

- (a) A web browser is software used to access information on the World Wide Web.
- (b) A web browser is software that makes local files available through the web.**
- (c) A web browser is a client.
- (d) A web browser sends requests to a web server.

Question 7

[2 marks] Which of the following keeps track of webpage accesses?

- (a) Operating system
- (b) Web browser
- (c) ISP
- (d) All of the above**

Question 8

[2 marks] What word is represented in ASCII as 84 73 82 69 68 assuming that A is 65?

- (a) TIERD
- (b) TIRDE
- (c) TIRED**
- (d) TRIED

Question 9

[2 marks] What colour is represented by #ff0000?

- (a) Black
- (b) Yellow
- (c) White
- (d) Red**

Question 10

[2 marks] How much memory would be required to store an image that has 16 different colours and is 8 pixels high and 6 pixels wide?

- (a) **24 bytes**
- (b) 96 bytes
- (c) 24 bits
- (d) 96 bits

Question 11

[2 marks] Which of the following statements about the Turing Test is FALSE?

- (a) If the judge cannot tell the human from the machine, then the machine is intelligent.
- (b) The judge tries to find which contestant is behaving the least like a human.
- (c) If the computer behaves intelligently, then it is intelligent.
- (d) **The Turing Test was based on the earlier Loebner Prize.**

Question 12

[2 marks] Which of the following statements about Weak AI is FALSE?

- (a) Weak AI states that computers can act *as if* they were intelligent.
- (b) **Weak AI states that computers that appear intelligent are *actually* thinking (not just *simulating* thinking).**
- (c) Weak AI states that we do not need to consider how a machine thinks - we can just look at the behaviour.
- (d) Weak AI states that external behaviour matters.

Question 13

[2 marks] Which of these values is most likely to be the CPU clock speed of a modern laptop?

- (a) **2 GHz**
- (b) 8 GHz
- (c) 2 GB
- (d) 2 MHz

Question 14

[2 marks] Which of the following statements about secondary storage is TRUE?

- (a) Secondary storage is quicker to access than RAM.
- (b) Because of Moore's Law, secondary storage is getting more expensive every year.
- (c) **Secondary storage is persistent.**
- (d) Secondary storage is always provided by magnetic media.

Question 15

[2 marks] How many different values can be stored in 1 byte (8 bits)?

- (a) 8
- (b) 2
- (c) 100,000,000
- (d) 256**

Question 16

[2 marks] Why do computers use binary values to store information?

- (a) Colour pictures can be represented by one binary digit per pixel.
- (b) Binary operations are easier for humans to understand.
- (c) On and off switches are simple to use as the building blocks of computers.**
- (d) Binary can store values more accurately than decimal.

Question 17

[2 marks] Which of the following statements about file formats is FALSE?

- (a) The file format specifies how data is encoded in the file.
- (b) A file format describes how the file will be formatted on the screen.**
- (c) png, gif and jpeg are file formats for graphics files.
- (d) Some operating systems use the file extension to determine the file format.

Question 18

[2 marks] Which of the following is NOT a Free Software freedom?

- (a) Freedom to use and distribute abandoned works.**
- (b) Freedom to distribute changed works.
- (c) Freedom to use and study the work.
- (d) Freedom to change the work.

Question 19

[2 marks] Which of the following people was not active during the period of the development of the personal computer?

- (a) Ed Roberts
- (b) Herman Hollerith**
- (c) Gordon Moore
- (d) Steve Wozniak

Question 20

[2 marks] In the history of personal computers which machine was the one most copied by what were known as clones?

- (a) **IBM PC**
- (b) Macintosh
- (c) The first Windows 95 machine
- (d) Apple II

Question 21

[2 marks] Which of the following lists is in correct chronological order (leftmost earliest)?

- (a) first mainframe computers, first personal computer, invention of the mouse, VisiCalc
- (b) invention of the mouse, first mainframe computers, first personal computer, VisiCalc
- (c) first mainframe computers, first personal computer, VisiCalc, invention of the mouse
- (d) **first mainframe computers, invention of the mouse, first personal computer, VisiCalc**

Question 22

[2 marks] Which of the following statements concerning the Copyright (Infringing File Sharing) Amendment Act 2011, is FALSE?

- (a) The person with the Internet service contract, rather than the user, is responsible for any illegal activity.
- (b) **Copyright holders send warning notices directly to users.**
- (c) The Act was designed to reduce copyright infringement using Peer to Peer networks.
- (d) After the third warning notice a person may be subject to a fine up to \$15,000.

Question 23

[2 marks] Which of the following statements about Peer to Peer networks is TRUE?

- (a) Some Peer to Peer networks provide different parts of large files from a number of different computers.
- (b) Connections are made directly from a computer to the computer which has the requested information.
- (c) Some Peer to Peer location information is held on a central server and some is scattered over the network.
- (d) **All of the above.**

Question 24

[2 marks] Which of the following is TRUE?

- (a) **Software errors have contributed to the death of patients receiving radiation therapy.**
- (b) Program trading was solely responsible for the stock market crash in 1987.
- (c) With the added security of the Internet, computer viruses are not as much of a problem now as they were in the 1980s.
- (d) All computer errors are caused by human failure.

Question 25

[2 marks] Which of the following is NOT a form of malware?

- (a) A logic bomb
- (b) A trojan horse
- (c) **A VPN**
- (d) A worm

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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.

26. Programming Using Python (10 marks)

(a) Show the output produced by the following Python program:

```
a = 3
b = 5
c = 2
while c < a * b:
    print(c)
    if c % 2 == 0:
        c = c + a
    else:
        c = c + b
```

2
5
10
13

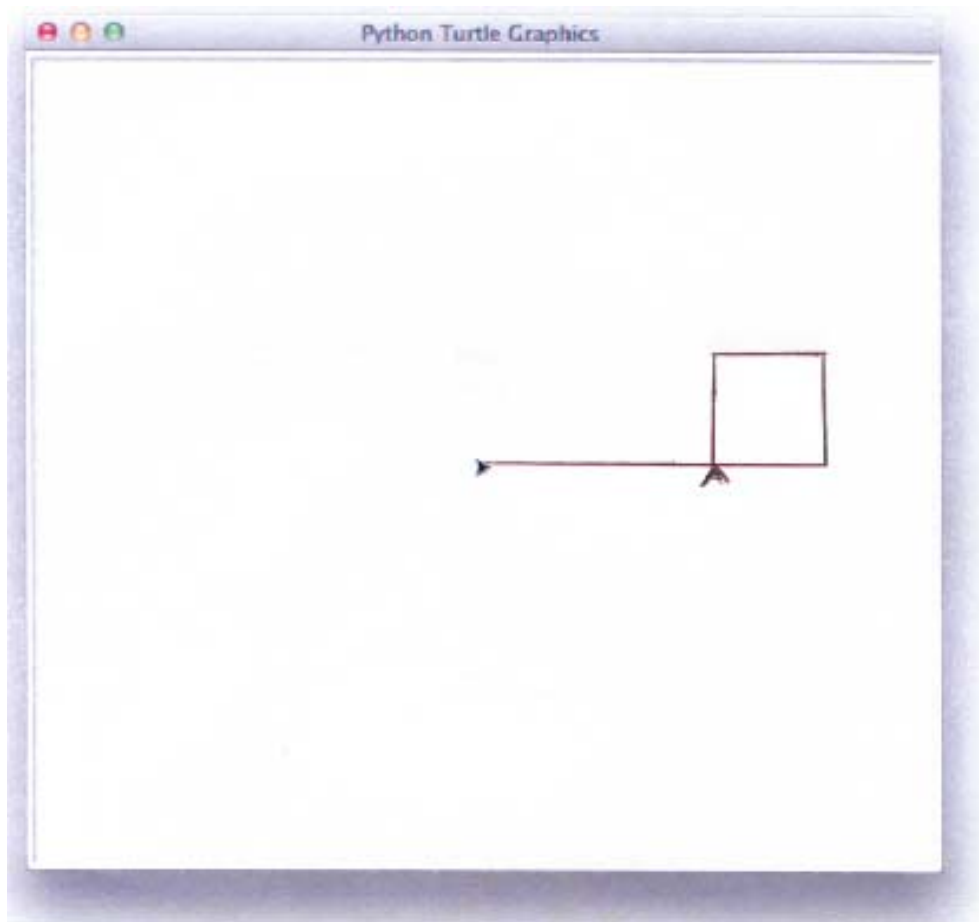
(3 marks)

- (b) Draw the output produced by the turtle in the following Python program. The turtle starts in the middle of the window facing right and the window is approximately 400 steps wide.

```
import turtle

turtle.forward(100)
turtle.left(90)

sides = 4
while sides > 0:
    turtle.forward(50)
    turtle.right(90)
    sides = sides - 1
```



(3 marks)

- (c) Write a Python program which asks the user to enter a number (a positive integer) and then prints out the sum of the integers from 1 up to and including the number entered. The output should appear exactly as in the examples below. In the first example below, the user entered “4” and in the second, “10”.

Example 1:

```
Enter a number: 4
The sum up to 4 is 10
```

Example 2:

```
Enter a number: 10
The sum up to 10 is 55
```

```
number = int(input("Enter a number: "))
sum = 0
value = 1
while value <= number:
    sum = sum + value
    value = value + 1
print("The sum up to", number, "is", sum)
```

(4 marks)

27. Spreadsheets (10 marks)

	A	B	C	D
1	2	3	4	9
2	5	18	6	29
3	7	8	9	24
4	72	10	11	93

- (a) In the Microsoft Excel spreadsheet above, the values in Columns A, B and C are added together to give the corresponding values in Column D. What is the **best** formula to use in **Cell D1**? You must ensure that your formula is able to be filled down.

= SUM(A1:C1)

(3 marks)

	A	B	C	D
1	1	3	4	12
2	0	18	6	24
3	0	8	9	17
4	1	10	11	110

- (b) In the Microsoft Excel spreadsheet above, the contents of each cell in Column D depends on the value of the corresponding cell in Column A. You need to fill in the **best** formula to use in **Cell D1**. Your formula should check to see if the value in A1 is 1. If it is 1, then D1 is the product of B1 times C1, otherwise it is the sum of B1 plus C1. **Note:** you should use an IF function in this cell and you must ensure that your formula is able to be filled down.

=if(A1 = 1, B1 * C1, B1 + C1)

(3 marks)

	A	B	C	D
1	Customer	Sam	Sally	Tom
2	Quantity	8	2	15
3	Unit Price	15	20	10
4	Total Price	120	40	150
5				
6				
7				
8	Quantity	Unit Price		
9	1	20		
10	5	15		
11	10	10		
12	20	5		
13				

- (c) The Microsoft Excel spreadsheet above calculates the total price of a customer ordering a specific quantity of units. The Unit Price in Row 3 depends upon the Quantity ordered (Row 2), and will be extracted from the Unit Price table in Cells A9:B12. The Total Price (shown in the 4th row) is the Quantity ordered times the Unit Price.

What is the **best** formula to use in **Cell B3**? Your formula should look up the Quantity in the Unit Price table and retrieve the appropriate Unit Price. Note: You must ensure that your formula is able to be filled right.

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(B2, A9:B12, 2, TRUE)`

(4 marks)

28. Databases (10 marks)

- (a) In a Microsoft Access database with two tables **Customers** and **Orders**, there is a one-to-many relationship between the primary key in the **Customers** table and a foreign key in the **Orders** table. Explain what it means if referential integrity is being enforced on this relationship.

All values in the foreign key of the Orders table records must exist as the primary key of a record in the Customers table. A new order cannot be added to the Orders table unless the Customer exists in the Customers Table.

(2 marks)

- (b) In Microsoft Access, the “Cascade Delete Related Records” option can be used when a record in one table (the primary table) is referred to in records in another table. What does this option do?

If a record in the primary table is deleted then all the related records in the other table are also deleted.

(2 marks)

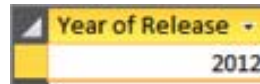
- (c) Complete the query by example (QBE) form below so that it generates a query that displays the Given name and Surname of the director of the movie with the title “The Hobbit”. The result should be:

Given name	Surname
Peter	Jackson

Field:	Given name	Surname	Title
Table:	Directors	Directors	Movies
Sort:			
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Criteria:			"The Hobbit"
or:			

(3 marks)

- (d) Given the same tables as in part (c), write an SQL query which displays the Year of Release of "The Hobbit":



Year of Release
2012

```
Select [Year of Release]
From Movies
Where Title = "The Hobbit";
```

(3 marks)

29. LaTeX (10 marks)

Write the LaTeX code that will produce the following output:

Statistical Hamlet

William Shakespeare

First Semester 2013

1 Soliliquy

Hamlet says:

To be, or not to be, that is the question:
Whether 'tis Nobler in the mind to suffer
The Slings and Arrows of outrageous Fortune, ...

2 Statistics

The standard deviation formula:

$$s = \sqrt{\frac{\sum_{i=1}^N (x_i - \bar{x})^2}{N - 1}}$$

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.

<i>Normal commands</i>	<i>Environments</i>	<i>Math mode commands</i>
<code>\emph{}</code>	<code>itemize</code>	<code>\$</code>
<code>\section{}</code>	<code>enumerate</code>	<code>\sum_{ } ^{ }</code>
<code>\subsection{}</code>	<code>verbatim</code>	<code>\sum</code>
<code>\subsubsection{}</code>	<code>flushright</code>	<code>\frac{ }{ }</code>
<code>\textbf{}</code>	<code>center</code>	<code>\sqrt{ }</code>
<code>\title{}</code>	<code>quote</code>	<code>\bar{ }</code>
<code>\author{}</code>	<code>displaymath</code>	<code>^</code>
<code>\date{}</code>	<code>equation</code>	<code>-</code>
<code>\maketitle</code>	<code>quotation</code>	
<code>\item</code>		
<code>\ldots</code>		


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

\title{Statistical Hamlet}
\author{William Shakespeare}
\date{First Semester 2013}
\maketitle
\section{Soliliquy}
Hamlet says:
\begin{quote}
To be, or not to be, that is the question:\\
Whether 'tis Nobler in the mind to suffer\\
The Slings and Arrows of outrageous Fortune, \ldots
\end{quote}
\section{Statistics}
The standard deviation formula:
\begin{displaymath}
s = \sqrt{\frac{\sum_{i=1}^N (x_i - \bar{x})^2}{N - 1}}
\end{displaymath}

\end{document}
```

(10 marks)

30. XHTML and CSS (10 marks)

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

Peter Gibbons Memorial Lecture Series

Lectures

For a full list of the lectures go to [Gibbons Memorial Lecture Series](#).
Below is a list of selected events.

Lecture Title	Date
A Better Paintbrush?	May 2
Why Academic Research Matters in Visual Effects	May 9

Try to go to at least one of these events.

NEXT

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.

Note: The url for the Peter Gibbons Memorial Lecture Series webpage is:
http://www.cs.auckland.ac.nz/our_department/Gibbons_Lectures/

```
<?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>Lectures</title>
  <style type="text/css">

h1 {
  text-align: center;
}

h2 {
  border-bottom-color: black;
  border-bottom-style: solid;
  border-bottom-width: thick;
}

```

```
.box {
  border-color: black;
  border-style: double;
  border-width: medium;
  padding: 10px;
}

.invert {
  background-color: black;
  color: white;
}

.label {
  font-weight: bold;
}

#footer {
  text-align: right;
  font-style: italic;
}

</style>
</head>

<body>

<!-- Main heading -->
```

```
<h1>Peter Gibbons Memorial Lecture Series</h1>
```

(1 mark)

```
<!--Lectures heading, etc.-->
```

```
<div class="box">
<h2>Lectures</h2>
<p>
For a full list of the lectures go to <a
href="http://www.cs.auckland.ac.nz/our_department/Gibbons_Le
ctures/">Gibbons Memorial Lecture Series</a>.<br />
Below is a list of selected events.
</p>
```

(3 marks)

```
<!-- Lectures table with 2px border -->
```

```
<table border="2px">
  <tr class="label">
    <td>Lecture Title</td>
    <td>Date</td>
  </tr>
  <tr>
    <td>A Better Paintbrush?</td>
    <td>May 2</td>
  </tr>
  <tr>
    <td>Why Academic Research Matters in Visual Effects</td>
    <td>May 9</td>
  </tr>
</table>
```

(3 marks)

```
<!-- Lectures bottom -->
```

```
<p class="invert">
  Try to go to at least one of these events.
</p>

</div>
```

(2 marks)

```
<!-- Footer -->
```

```
<p class="label" id="footer">NEXT</p>
```

(1 mark)

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