

THE UNIVERSITY OF AUCKLAND

FIRST SEMESTER, 2006
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		12
2	Internet		16
3	Home / Office Applications		30
4	XHTML and CSS		10
5	Programming using Python		8
6	LaTeX		8
7	Special Topics		8
8	History and Social Issues		8
TOTAL			100

CONTINUED

1. Hardware / Software (12 marks)

(a) How many bits are required to represent the number 17?

(2 marks)

(b) Exactly how many bytes are there in one KiB?

(2 marks)

(c) A number of descriptions are listed below. For each description, find the term that is the best match from the list of terms provided. Not all terms should be used.

Terms:

- | | | | |
|---------------|--------|-------------|---------------|
| Graphics Card | Screen | RAM | HTTP |
| CPU | AGP | DNS | USB |
| HDD | PDF | Motherboard | Mouse |
| Modem | GHz | MB | Ethernet Card |

(i) The “brain” of the computer.

(ii) Very fast volatile memory.

(iii) The main circuit board of a computer.

(iv) An expansion slot used to plug in a graphics card.

(v) Device used for long-term storage.

(vi) An input device.

(vii) A unit of measurement for speed of a processor.

(viii) Used to connect the computer to a LAN.

(4 marks)

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(d) Briefly explain what spyware is. Give an example of what it might do.

(2 marks)

(e) What is open source software?

(2 marks)

2. Internet (16 marks)

(a) What does the DNS do?

(2 marks)

(b) Put the following events into chronological order. In other words, list the events in the order that they occurred, from earliest to latest.

- (i) TCP/IP was developed
- (ii) The WWW was created
- (iii) New Zealand connected to the Internet
- (iv) ARPANET was created
- (v) DNS was created

(2 marks)

(c) What is the purpose of the CC field in an email application?

(2 marks)

(d) Who created the WWW?

(2 marks)

(e) What is a moderator?

(2 marks)

(f) Explain how blogs differ from other kinds of web sites.

(2 marks)

(g) Would you trust the information on a wiki? Explain your answer.

(2 marks)

(h) The WWW is known as a client-server system. Briefly describe what the client and server are, and how they interact.

(2 marks)

3. Home / Office Applications (30 marks)

(a) What does ASCII stand for?

(2 marks)

(b) What is EndNote software used for?

(2 marks)

(c) How much memory is required to store an image that is 8 pixels high, 8 pixels wide and uses 8 colours? Indicate whether your answer is in bits or bytes. Show your working.

(2 marks)

(d) What kinds of images are best compressed using the GIF compression algorithm? Give an example.

(2 marks)

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- (e) The following spreadsheet is used to look up the height of women in a table. Write the formula that would appear in cell C10. Your formula should use a VLOOKUP. You should ensure that your formula is able to be filled down.

	A	B	C
1	Women		
2	Height (cm)	Description	
3	0	Very short	
4	154	Short	
5	160	Average	
6	169	Tall	
7	175	Very tall	
8			
9	Name	Height	Description
10	Jenny	143	Very short
11	Rose	189	Very tall
12	Matilda	154	Short
13	Gertrude	166	Average
14	Sue	169	Tall

(3 marks)

- (f) The following spreadsheet records the height and gender of a number of people. The code “F” is used to indicate that the person is female, and the code “M” is used to indicate that the person is male. The word “Female” or “Male” will appear in column D depending on the code that appears in column C (i.e. “Female” will appear when the code is “F” and “Male” will appear when the code is “M”). You can assume that the code will be either an “F” or an “M”. Write the formula that would appear in cell D2. You should ensure that your formula is able to be filled down.

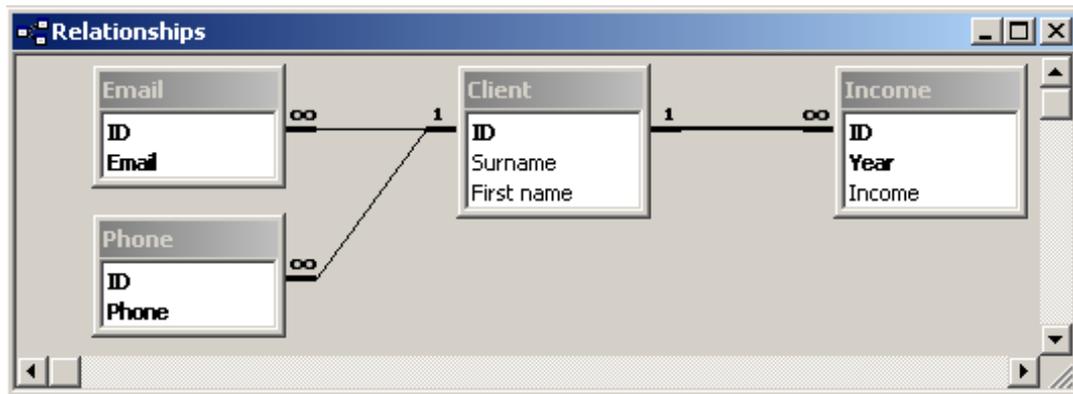
	A	B	C	D
1	Name	Height	Code	Gender
2	Jenny	143	F	Female
3	Rose	189	F	Female
4	Rodney	179	M	Male
5	Reginald	165	M	Male
6	Matilda	154	F	Female
7	Bruce	154	M	Male
8	Fred	210	M	Male
9	Gertrude	166	F	Female

(3 marks)

(g) What does SQL stand for?

(2 marks)

The following diagram is used by questions (h) and (i):



(h) Given the relationship diagram shown above, state the primary key(s) and foreign key(s) (if any) of the Income table.

Primary key(s):

Foreign key(s):

(3 marks)

(i) Given the relationship diagram shown above, write the SQL command that will produce a list of the surnames and phone numbers of anyone that has earned more than 100000 dollars in any given year.

(3 marks)

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(j) Edward Tufte opposes the use of PowerPoint. State one of his major criticisms.

(2 marks)

(k) What advice would you give someone about the use of animations in PowerPoint?
Justify your answer.

(2 marks)

(l) What advice would you give to someone about the use of fonts in a PowerPoint presentation? Justify your answer.

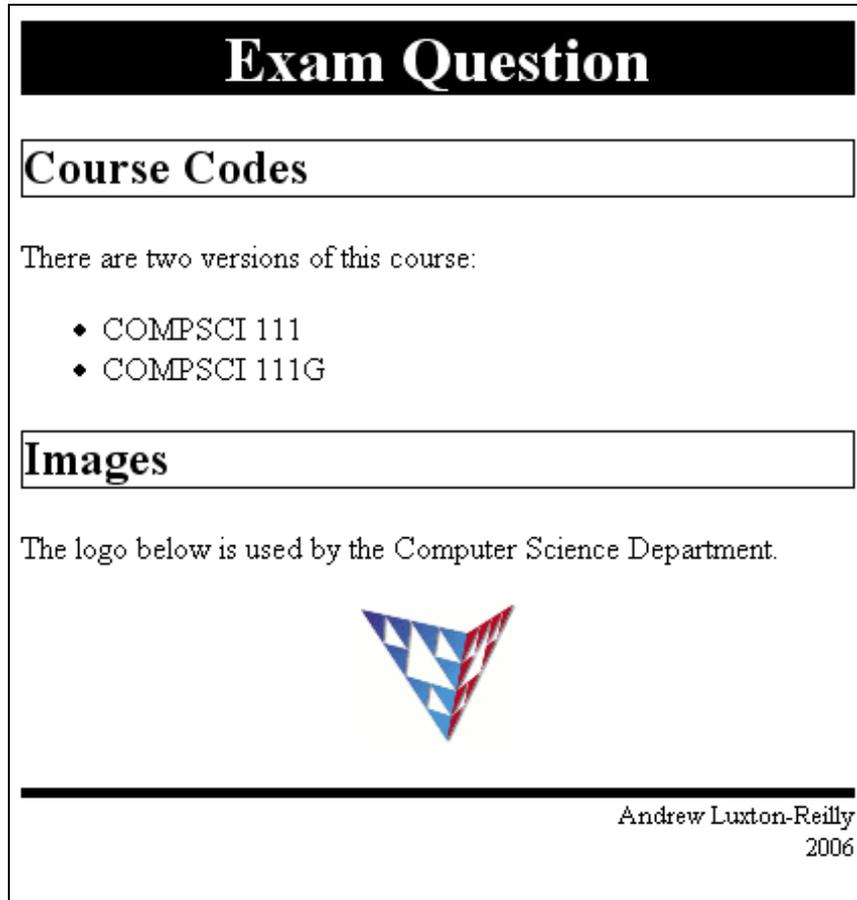
(2 marks)

(m) Should normal text in a web page be underlined? Explain why.

(2 marks)

4. XHTML and CSS (10 marks)

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



The following XHTML code is supposed to create the page shown previously. It is partially completed. Do not cross out or alter any of the existing code. Add your own code to complete the page. You must use the styles provided. Note: The image file is called "Logo.gif" and it is stored in the same directory as the XHTML code.

```
<?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><head><title>Exam Question</title>
<style type="text/css">
h1 {
  background-color: black;
  text-align: center;
  color: white;
}
h2 {
  border-width: thin;
  border-style: solid;
}

```

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```
.footer {
  text-align: right;
  font-size: small;
  border-top-width: thick;
  border-top-style: solid;
}
.image {
  text-align: center;
}
</style></head>
<body>
```

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

(8 marks)

CONTINUED

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- (b) Write the XHTML source code that will create a link on a web page. The link text that appears on the page should be “Help” and the destination of the link is the web site located at the domain name “www.w3schools.com”.

(2 marks)

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5. Programming using Python (8 marks)

- (a) Write a program that asks the user to enter a number of pounds and prints out the corresponding number of kilograms. The formula to convert pounds to kilograms is as follows:

$$1 \text{ pound} = 0.45359237 \text{ kilograms}$$

A sample of the output that is expected from your program is shown below:

```
Enter the number of pounds: 10
10 pounds is 4.5359237 kilos
```

(5 marks)

- (b) What is the output produced by the following program?

```
s = 0
i = 0
while i < 5:
    i = i + 1
    print i
    s = s + i
print s
```

(3 marks)

CONTINUED

6. LaTeX (8 marks)

Write the LaTeX code that will produce the following output:

1 Introduction

LaTeX can typeset mathematical equations such as:

$$e = mc^2$$

and

$$\sum_{k=0}^n ar^k = \frac{a(1 - r^{n+1})}{1 - r}$$

Note that:

- This is a very short document
- All the commands are provided
- Some structure is included

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>	itemize	<code>\sum_{ } ^{ }</code>
<code>\section{}</code>	enumerate	<code>^</code>
<code>\subsection{}</code>	verbatim	<code>—</code>
<code>\large</code>	flushright	<code>\frac{ }{ }</code>
<code>\small</code>	center	
<code>\textbf{}</code>	quote	
<code>\textit{}</code>	displaymath	
<code>\item</code>	equation	

```

\documentclass[a4paper]{article}
\begin{document}
%No title used in this document
%Start with the Introduction below

```

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\end{document}

(8 marks)

CONTINUED

7. Special Topics (8 marks)

(a) What is the Time To Live (TTL) field in the header of an IP packet used for?

(2 marks)

(b) The following scenario is well-known in the AI community:

A simple computer terminal is provided for a human (known as the interrogator) to communicate with an entity in a separate room. The entity in the other room is either a person, or a computer. The interrogator is allowed to communicate by typing questions and receiving responses. After a period of time, the interrogator must determine whether the entity they were communicating with was a computer or a human.

What is this test called?

(2 marks)

(c) The following objects can be rendered using computer graphics. However, some of these objects are much more difficult to render realistically than others. Arrange these in order from easiest to most difficult to render:

A mirror, a marble statue, a glass jug, an unpainted box.

(2 marks)

(d) In terms of accessing data (e.g. data in a variable or database field), what is the purpose of a *lock*?

(2 marks)

8. History and Social Issues (8 marks)

(a) What corporation is Gordon Moore associated with?

(2 marks)

(b) Who were the founders of Apple?

(2 marks)

(c) Imagine that the parents of a 10 year old child want their child to have Internet access at home, but they are worried about the content present on the Internet. State two different approaches that the parents could take.

(i) First possible approach

(2 marks)

(ii) Second possible approach

(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.

CONTINUED

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.

ID.....

- 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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