

THE UNIVERSITY OF AUCKLAND

SECOND SEMESTER, 2011**Campus: City/Epsom**

COMPUTER SCIENCE**Mastering Cyberspace: 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 - 20	Multiple Choice		50
21	Programming using Python		10
22	Spreadsheets		10
23	Databases		10
24	XHTML and CSS		10
25	LaTeX		10
TOTAL			100

CONTINUED

SECTION A**MULTIPLE CHOICE QUESTIONS**

Each question in this section is worth **2.5 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

[2.5 marks] Which decimal number is represented by the binary number 100111?

- (a) 57
- (b) 24
- (c) 39
- (d) 78
- (e) 114

Question 2

[2.5 marks] Which of the following values represents 1024 x 1024 x 1024 x 1024 bytes?

- (a) 1 MB
- (b) 1 MiB
- (c) 1 GiB
- (d) 1 GB
- (e) None of the above

Question 3

[2.5 marks] How much RAM would you expect to have in a modern desktop PC?

- (a) 2 PiB
- (b) 2 MiB
- (c) 2 GiB
- (d) 2 TiB
- (e) 2 KiB

Question 4

[2.5 marks] How fast would you expect the CPU to be in a modern desktop PC?

- (a) 7200 RPM
- (b) 2 GHz
- (c) 100 MHz
- (d) 2 MB
- (e) 2 FLOPS

Question 5

[2.5 marks] Which of the following statements about software is FALSE?

- (a) A file format specifies how to interpret the sequence of numbers stored in a file.
- (b) File extensions are used to decide which operating system to use when opening the file.
- (c) All data in a file is stored as binary numbers.
- (d) A file extension consists of a dot followed by characters occurring at the end of a file name.
- (e) Both programs and data can be stored as files on secondary storage.

Question 6

[2.5 marks] Which of the following statements about software is FALSE?

- (a) Open standards are free to use.
- (b) Any software that is free to download and use can be legally copied, modified and shared with others.
- (c) Open source software is distributed with source code so anyone can study how the software was designed and implemented.
- (d) Proprietary software has restrictions on using and copying that are enforced by the owner.
- (e) Software is protected by copyright law.

Question 7

[2.5 marks] Which of the following statements about PowerPoint is FALSE?

- (a) The content in PowerPoint is normally organised in a hierarchy of bullet points.
- (b) Slide Masters help users to create consistent presentations.
- (c) Slide Layout is used to arrange the order in which the slides appear.
- (d) A design theme affects the appearance of the entire presentation.
- (e) Edward Tufte claims that the design of PowerPoint encourages users to create poor presentations.

Question 8

[2.5 marks] Which of the following statements about PowerPoint is TRUE?

- (a) Notes that are **not** visible to the audience can be added to a presentation using the Notes page.
- (b) Transitions between slides are used to separate slides when they are printed.
- (c) Animations can only be applied to drawings, not to text or pictures.
- (d) The font used for bullet points should be a maximum of 18 point size.
- (e) A well-designed presentation should use animation on every slide to ensure the audience remains interested.

Question 9

[2.5 marks] Which of the following statements relating to social issues is FALSE?

- (a) The Internet allows information that is legal in one country to be accessed from another country where it is illegal.
- (b) Computer games are included in the Films, Videos and Publications Act and may be banned from entry into New Zealand.
- (c) Peer to Peer networks allow information stored on a home machine to be shared with other users.
- (d) Prior to the Copyright Amendment Act 2008, it was illegal to shift music from a CD to an MP3 player, even if you owned the CD.
- (e) A parent or guardian may legally allow their own children to watch age restricted material if they are under the legal age, but only if they are supervised.

Question 10

[2.5 marks] Which of the following statements relating to risks is TRUE?

- (a) A computer worm attaches itself to a host program and infects other files when the host program is executed.
- (b) On at least two occasions, military computer systems have falsely reported nuclear attacks taking place.
- (c) Computer viruses can spread to human hosts if people install computer components without using gloves or other appropriate protection.
- (d) No computer hardware has systematically performed incorrect calculations.
- (e) No computer software failure has ever caused a fatal accident to occur.

Question 11

[2.5 marks] What was the Therac-25?

- (a) A machine used in hospitals which caused severe radiation burns due to software and user error.
- (b) A counter-espionage operation planned by the CIA that resulted in the destruction of a Soviet gas pipeline.
- (c) The 25th version of a flight control system responsible for the crash of a Chinook helicopter.
- (d) The control system used in patriot missiles that failed to correctly intercept incoming missiles.
- (e) A rocket that exploded due to a faulty computer chip.

Question 12

[2.5 marks] Put the following historical events into chronological order from earliest to latest.

- (a) Apple founded, Intel founded, IBM founded, Adobe founded
- (b) Intel founded, Apple founded, IBM founded, Adobe founded
- (c) IBM founded, Intel founded, Apple founded, Adobe founded
- (d) IBM founded, Apple founded, Adobe founded, Intel founded
- (e) Intel founded, IBM founded, Adobe founded, Apple founded

Question 13

[2.5 marks] Which of the following statements about historical events is FALSE?

- (a) IBM bought the operating system used on the IBM PC from Microsoft.
- (b) International Business Machines created the first microprocessor.
- (c) Apple computers became popular largely because VISICALC was only available for Apple machines.
- (d) Xerox PARC developed a prototype of the graphical user interface that become popular with the release of the Macintosh computer.
- (e) The first personal computer was sold as a kitset that you had to build yourself.

Question 14

[2.5 marks] Which of the following is a Turing test supposed to be testing for?

- (a) Whether a human can think like a human.
- (b) Whether a computer can think like a human.
- (c) Whether a human can think like a computer.
- (d) Whether a human can act like a computer.
- (e) Whether a computer can act like a human.

Question 15

[2.5 marks] Which of the following statements about TCP/IP is FALSE?

- (a) Divides the message into packets.
- (b) Defines routing information.
- (c) Checks that all packets arrive.
- (d) Combines packets to reform message.
- (e) Allows us to associate a human-readable name with an IP address.

Question 16

[2.5 marks] What is the main difference between a chat room and a forum?

- (a) One is a discussion group and the other is a discussion with friends.
- (b) One is secure and the other is insecure.
- (c) One is synchronous and the other is asynchronous.
- (d) One is talking to one person and the other is talking to many people.
- (e) Good manners are necessary with one but not with the other.

Question 17

[2.5 marks] Which of the following statements about a wiki is FALSE?

- (a) Creates a central pool of content.
- (b) A markup language is used to format information displayed on a wiki.
- (c) Content displayed in reverse chronological order.
- (d) Quick to develop material.
- (e) Easy to use.

Question 18

[2.5 marks] What is a proxy?

- (a) A hypermedia document designed for the WWW.
- (b) A local copy of information for quick access.
- (c) A computer which sits between the client and server, intercepts and processes requests.
- (d) A device that prevents unauthorised access to or from a private network.
- (e) A collection of Web pages related to a single topic or theme. Normally designed and maintained by a single individual or organisation.

Question 19

[2.5 marks] Which of the following is not a basic feature of MS Word?

- (a) A clipboard that holds 4 items.
- (b) Word wrap.
- (c) Paragraph formatting.
- (d) Character formatting.
- (e) Insert/delete.

Question 20

[2.5 marks] What is unique about vector graphics compared with other image storage standards?

- (a) Lossless method.
- (b) The memory required is independent of the image size.
- (c) Good for photos.
- (d) Uses an algorithm that was patented.
- (e) Restricts the number of colours.

THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK.

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.

21. Programming Using Python (10 marks)

- (a) Show the output from the following program after the user enters the number **4** at the prompt. Show each space in the output with the “^” character.

```
number = int(input("Enter a number: "))
result = number
value = number
print("Calculating Result:")
while value > 1 :
    value = value - 1
    result = result * value
print("Result for",number,"is",result)
```

Enter a number: 4
Calculating^Result:
Result^for^4^is^24

(4 marks)

- (b) Write a Python program that prompts for and reads in from the user, the length of the sides of two squares, calculates the area of both squares and prints out the absolute difference in their areas. The area of a square is calculated by multiplying the length of one side of the square by itself. The absolute difference in area is calculated by subtracting the smallest area from the largest area.

The following **two examples** show the exact formatting expected for the prompts and output. Your program must produce the same output as shown below given the input shown below. You can assume that only whole numbers will be entered.

Example 1:

```
Enter length of first square: 4
Enter length of second square: 2
Difference in area is 12
```

Example 2:

```
Enter length of first square: 2
Enter length of second square: 4
Difference in area is 12
```

```
lengthOfFirst = int(input("Enter length of first square"))
lengthOfSecond = int(input("Enter length of second square"))
areaOfFirst = lengthOfFirst * lengthOfFirst
areaOfSecond = lengthOfSecond * lengthOfSecond
if areaOfFirst > areaOfSecond:
    difference = areaOfFirst - areaOfSecond
else:
    difference = areaOfSecond - areaOfFirst
print("Difference in area is",difference)
```

(6 marks)

22. Spreadsheets (10 marks)

The following is a Microsoft Excel spreadsheet.

The values in Column **E** were obtained by using the data in Column **D** to look up the appropriate value in the table in Columns **B** and **C (Cells B3:C7)**.

The numbers in Column **F**, Rows **10** through **16**, were computed by multiplying the corresponding number in Column **E** by the number in Cell **A1**.

The number in Cell **F18** is the minimum of the numbers in Column **F** Rows **10** through **16**.

	A	B	C	D	E	F
1	15					
2						
3		a	21			
4		b	35			
5		c	13			
6		d	27			
7		e	65			
8						
9						
10				b	35	525
11				d	27	405
12				a	21	315
13				a	21	315
14				d	27	405
15				b	35	525
16				c	13	195
17						
18						195
19						

(a) What is the **best** formula to use in Cell **F18**?

= MIN(F10:F16)

(3 marks)

- (b) What is the **best** formula to use in Cell **F10**? **Note:** You must ensure that your formula can be filled down.

= E10 * \$A\$1

(3 marks)

- (c) What is the **best** formula to use in Cell **E10**? **Note:** You must ensure that your formula can be filled down.

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:

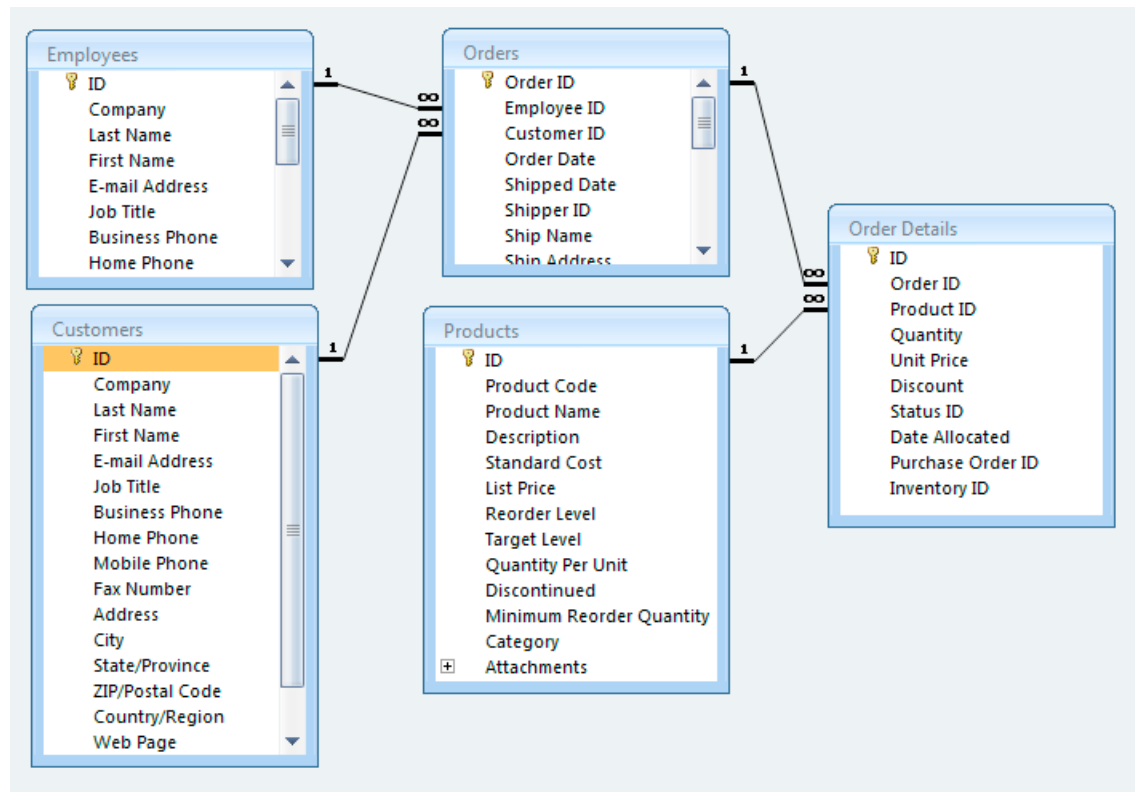
`vlookup(lookup_value, table_array, col_index_num, [range_lookup])`

=VLOOKUP(D10, \$B\$3:\$C\$7, 2, FALSE)

(4 marks)

23. Databases (10 marks)

Use the following Microsoft Access relationship diagram to answer the questions in this section. Note that the primary key of each table uses the AutoNumber type to ensure uniqueness.



- (a) Give the name of any foreign key(s) in the **Order Details** table, along with their related table(s).

Order ID - related table is Orders
Product ID - related table is Products

(2 marks)

- (b) What is an appropriate **data type** for the **Product Name** field of the **Products** table?

Text

(2 marks)

- (c) Is it possible for a specific combination of **Order ID** and **Product ID** to appear in more than one record in the **Order Details** table? Why or why not?

Yes, it is possible for a specific combination to appear in more than one record. Order ID and Product ID do not form the primary key of the Order Details table so the combination does not need to be unique.

(2 marks)

- (d) Give an SQL statement that displays the standard cost, the product name, and the description of products whose standard cost is under \$10.00 (i.e. Standard Cost < 10). Example output from the SQL query is shown below.

Standard Cost ▾	Product Name ▾	Description ▾
5.67	Top	Spinning Top
9.23	Slinky	Metal Coil
9.99	Super Glider	Wooden Glider
*		

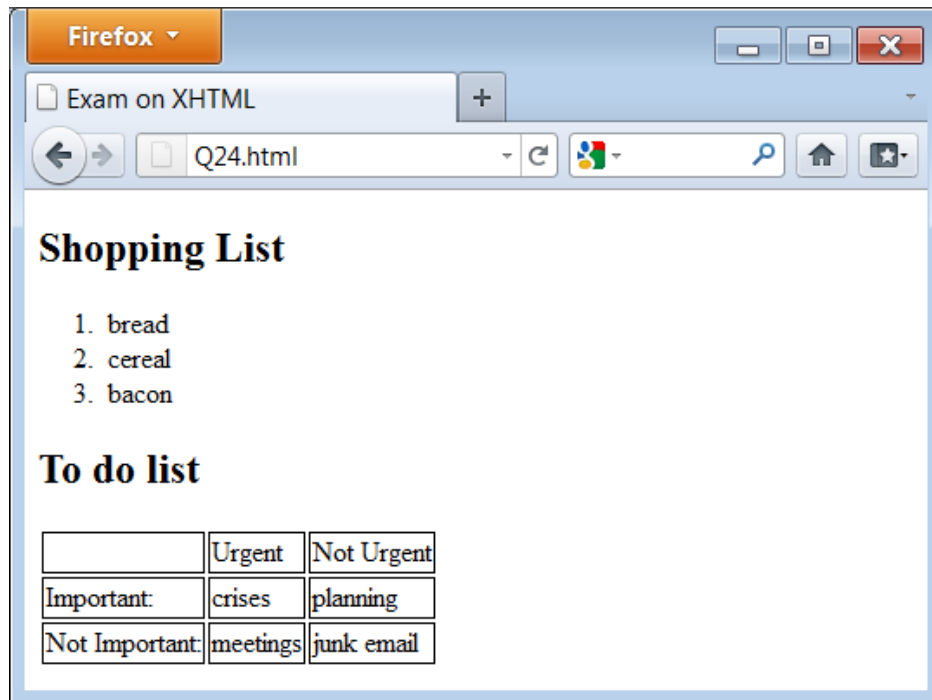
Example output from the SQL query

```
SELECT [Standard Cost], [Product Name], Description
FROM Products
WHERE [Standard Cost] < 10;
```

(4 marks)

24. XHTML and CSS (10 marks)

The following screenshot shows a web page created using XHTML 1.0:



Complete the XHTML code below so that it produces the output shown above. You **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">

<head>

    <title>
        Exam on XHTML
    </title>

    <style type = "text/css">
        td {border-width: thin;
            border-color: black;
            border-style: solid;}
    </style>

</head>
```

```
<body>
```

```
<h2> Shopping List</h2>
```

```
<!-- shopping list -->
```

```
<ol>
  <li>bread</li>
  <li>cereal</li>
  <li>bacon</li>
</ol>
```

(4 marks)

```
<h2>To do list</h2>
```

```
<!-- Things to do Table -->
```

```
<table>
  <tr>
    <td> </td>
    <td>Urgent</td>
    <td>Not Urgent</td>
  </tr>
  <tr>
    <td>Important</td>
    <td>crises</td>
    <td>planning</td>
  </tr>
  <tr>
    <td>Not Important</td>
    <td>meetings</td>
    <td>junk email</td>
  </tr>
</table>
```

(6 marks)

```
</body>
```

```
</html>
```

25. LaTeX (10 marks)

Write the LaTeX code that will produce the following output:

A short exam question

Andrew Luxton-Reilly

Semester 2, 2011

1 Advantages

1.1 Structure

Latex helps you to structure your documents.

1.1.1 Commands

Explicit commands make the structure clear.

1.2 Mathematics

Latex is excellent for equations such as $k_{n+1} = k^{n-1} + \frac{1+x}{1-x} + \sqrt{k+1}$

2 Disadvantages

Some disadvantages are listed here.

1. Latex is not WYSIWYG
2. Errors are hard to understand

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>\frac{ }{ }</code>
<code>\subsection{}</code>	<code>verbatim</code>	<code>\sqrt{ }</code>
<code>\subsubsection{}</code>	<code>flushright</code>	<code>\pi</code>
<code>\large</code>	<code>center</code>	<code>\left(</code>
<code>\textbf{ }</code>	<code>quote</code>	<code>\right)</code>
<code>\title{ }</code>	<code>displaymath</code>	<code>\pi</code>
<code>\author{ }</code>	<code>equation</code>	<code>\sum_{ }^{ }</code>
<code>\date{ }</code>	<code>quotation</code>	<code>^</code>
<code>\maketitle</code>		<code>-</code>
<code>\item</code>		


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

```
\title{A short exam question}
\author{Andrew Luxton-Reilly}
\date{Semester 2, 2011}
\maketitle
```

(2 marks)

```
\section{Advantages}
```

```
\subsection{Structure}
Latex helps you to structure your documents.
\subsubsection{Commands}
Explicit commands make the structure clear.
\subsection{Mathematics}
Latex is excellent for equations such as

$$k_{n+1} = k^{n-1} + \frac{1+x}{1-x} + \sqrt{k+1}$$

```

(6 marks)

```
\section{Disadvantages}
```

```
Some disadvantages are listed here.
\begin{enumerate}
\item Latex is not WYSIWYG
\item Errors are hard to understand
\end{enumerate}
```

(2 marks)

```
\end{document}
```