

THE UNIVERSITY OF AUCKLAND

SUMMER SEMESTER, 2012

Campus: City

Computer Science

Mastering Cyberspace: An Introduction to Practical Computing

TERMS TEST

(Time Allowed: ONE hour)

- NOTE:
- Calculators are not permitted
 - There is space at the back for answers that overflow the allotted space.

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

	Question	Mark	Out Of
1 - 7	Digital, Hardware, Software		25
8 - 15	Internet		25
16 - 20	XHTML and CSS		20
21 - 24	Presentation		10
25 - 28	Applications and Graphics		10
29 - 31	Spreadsheets		10
	TOTAL		100

Digital Information, Hardware and Software (25 marks)

1. Storing information:

(i) How many bits would be required to represent 8 different numbers?

3

(2 marks)

(ii) Convert the binary number 1101 to decimal.

13

(2 marks)

(iii) Convert the the decimal number 21 to binary.

10101

(2 marks)

(iv) How many different numbers can be represented using 4 bits?

16

(2 marks)

2. Give **two** examples of input devices and **two** examples of output devices.

Input Devices: **Keyboard, mouse, scanner, trackpad, microphone, pen, etc.**

Output Devices: **Monitor, speakers, printer, plotter, etc.**

(2 marks)

3. Explain the difference between analogue information and digital information and give an example of each type.

Analogue information is continuous information that changes in infinitely small steps. Examples include real world information such as sound and colour, captured by soundwaves and light waves.

Digital information is discrete and can only change within a predefined number of discrete steps. It is not continuous like real world information. Any information stored within a computer is digital information.

(4 marks)

4. List each of Richard Stallman's 4 freedoms regarding open source software.

1) Freedom to use

2) Freedom to copy (and share with others)

3) Freedom to modify

4) Freedom to distribute (the modified work)

(4 marks)

5. How does **flash** memory differ from primary memory (RAM)?

Flash memory is non-volatile (i.e information is not lost when the power is turned off), whereas RAM is volatile.

(2 marks)

6. What is **proprietary** software?

Software that is owned by an individual or company and the owner retains all the rights to the software.

(3 marks)

7. Name **one** file extension (*for example, .exe*) for **each** of the following file formats:

graphics file extension: **.png, .gif, .jpeg, .jpg, .svg, .bmp, .tiff, etc.**

sound file extension: **.mp3, .wav, .wma, etc.**

(2 marks)

Internet (25 marks)

8. Explain the differences between **circuit-switching** and **packet-switching**.

A circuit switching network involves a centralised design where there exists a central authority in the network. All communication occurs via the central authority and if it is down or gets destroyed this results in network failure.

On the other hand, a packet switching network uses a decentralised design where all nodes in the network have equal importance and there is no central authority. Communication between two nodes in the network can occur via any path that exists between those two nodes. If some nodes are down this doesn't result in network failure as alternative paths can be used to route a message.

(5 marks)

9. Explain the differences between **POP3** and **IMAP** protocols.

Both **POP3** and **IMAP** are protocols for receiving email messages.

When a client downloads email via **POP3** (Post Office Protocol 3) a copy of the message is **NOT** left on the mail server.

Whereas, when a client downloads email via **IMAP** (Internet Message Access Protocol) a copy of the message is retained on the mail server.

(4 marks)

10. What does **SMTP** stand for?

Simple Mail Transfer Protocol

(2 marks)

11. What is an **asynchronous** communication system? Give an example of an **asynchronous** communication system.

A system where communication does not occur at the same time. Examples include email, voicemail, text messaging, snail mail etc.

(4 marks)

12. What does a **DNS server** do?

Maps domain names to ip addresses, so that information can be sent to the correct location.

(4 marks)

13. What is a **blog**?

A web log, such as an online journal where posts appear in reverse chronological order. Other types of blogs also include photoblogs, videoblogs or soundblogs (podcasts).

(2 marks)

14. What is the name of the early network which began with 4 nodes in 1969 and was the forerunner to the Internet?

ARPANET

(2 marks)

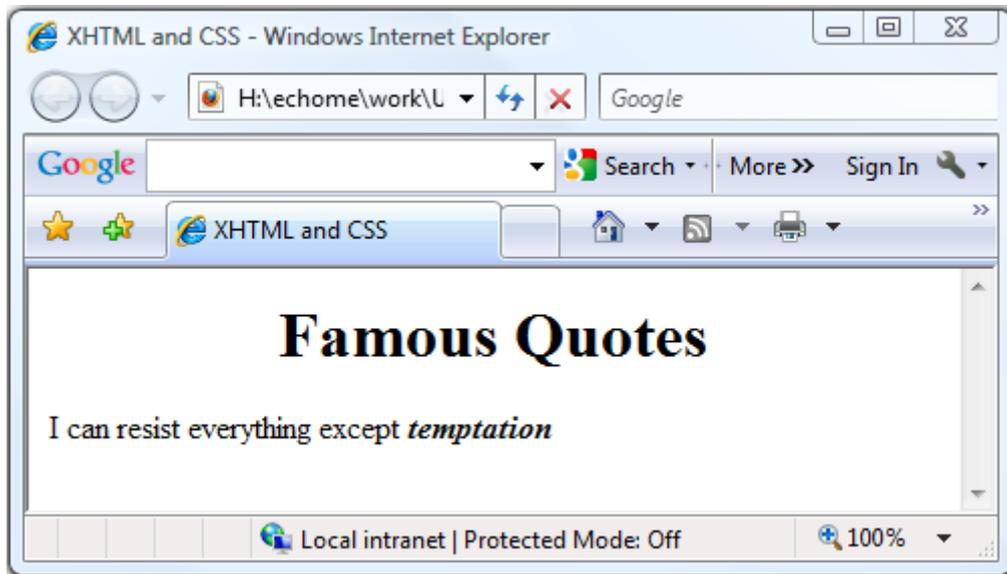
15. A Local Area Network operates within a radius of how many kilometres?

1 Km

(2 marks)

XHTML and CSS (20 marks)

16. The following screenshot shows a web page created using XHTML 1.0 and CSS. Complete the source code below that would result in the web page shown below. You **must** use the style rules provided in the internal style sheet.



```
<?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>XHTML and CSS</title>
<style type="text/css">
#middle{text-align: center;}
.tempt{font-weight: bold; font-style: italic;}
</style>
</head>
<body>

  <h1 id="middle">Famous Quotes</h1>
  <p>I can resist everything except
    <span class="tempt">temptation</span>
  </p>

</body>
</html>
```

(6 marks)

17. Define **one** XHTML CSS style rule that makes **all** headings (h1 – h6) the colour green.

```
h1,h2,h3,h4,h5,h6 {color: green;}
```

(3 marks)

18. Define an XHTML CSS **class selector** named '**code**' that makes all text that **code** is applied to sans-serif font and uppercase.

```
.code {  
    font-family: sans-serif;  
    text-transform: uppercase;  
}
```

(3 marks)

19. Define an XHTML CSS style rule that makes the background colour of the whole body of the page silver.

```
body {background-color: silver;}
```

(3 marks)

20. Suppose that in an **external style sheet** we have the style rule:

```
p
{
    font-family: "Verdana", sans-serif;
    color: red;
    font-size: small;
    font-style: italic;
}
```

while in the head of our XHTML document we have the following **internal style sheet**:

```
<style type="text/css">
    p{color: green;}
    #bigger{font-size: x-large;}
</style>
```

then the following XHTML code in the body of the document will produce a paragraph with what type of text?

```
<p id="bigger">I am the walrus</p>
```

color: green

font-size: x-large

font-family: "Verdana", sans-serif if "Verdana" not available

font-style: italic

text-align: left align

(5 marks)

Presentation (10 marks)

21. If you were asked to prepare a 15 minute PowerPoint presentation, as an approximate guide, what is the maximum number of slides your presentation should contain?

30

(2 marks)

22. What were Edward Tufte's criticisms of PowerPoint?

Use of PowerPoint means that people focus more on presentation appearance, when they should be focussed on the actual content.

PowerPoint forces users to present small pieces of information via the use of hierarchical bullet points, whereas some information is not structured in this way. Therefore, the use of PowerPoint results in a dumbing down of information leading to a lack of understanding by the audience.

(4 marks)

23. What is the **smallest** size font you should typically use within a PowerPoint presentation?

18 pt

(2 marks)

24. State **one** guideline regarding the use of **text colour** within a PowerPoint presentation?

Use colours that contrast well with background colours.
Don't use too many colours.

(2 marks)

Applications and Graphics (10 marks)

25. How much memory would be required to store a black and white bitmap image that is 4 pixels high and 6 pixels wide? Show **all** your working.

2 colours requires 1 bit per pixel
Number of bits = $4 * 6 * 1 = 24$ bits.

(2 marks)

26. How many **bytes** would be required to store an image that has 16 colours and is 4 pixels high and 5 pixels wide? Show **all** your working.

16 colours requires 4 bits per pixel
Bits required = $4 * 5 * 4 = 80$
Bytes required = $80 / 8 = 10$ bytes.

(3 marks)

27. For the image compression algorithms listed below, state whether they are good for photos or not. Answer **yes** or **no**.

gif: **no**

png: **no**

jpeg: **yes**

(3 marks)

28. Given the image compression types listed in the above question (i.e. gif, png and jpeg) which one(s) use a **lossy** compression method? State *none* if none of them do.

jpeg

(2 marks)

Spreadsheets (10 marks)

John, Paul, George, Ringo, Pete and Brian have just finished watching a movie called *The Magical Mystery Tour*. They have been asked to rate how much they enjoyed it. In the following Microsoft Excel spreadsheet, a **Ratings Scale** table is given on the left hand side that associates ratings with descriptions (larger values indicate better ratings). On the right hand side of the spreadsheet are the ratings each person has given the movie. Row **I** records whether the person has given the movie the best rating available in the table (“Y”), or not (“N”).

	A	B	C	D	E	F	G	H	I
1									
2						Name	Rating		Top Rating?
3		Ratings Scale				John	2	Poor	N
4		1	Very Poor			Paul	4	Good	N
5		2	Poor			George	3	Fair	N
6		3	Fair			Ringo	5	Great	Y
7		4	Good			Pete	1	Very Poor	N
8		5	Great			Brian	3	Fair	N
9									
10						Average	3		
11									

29. What is the **best** formula to use in Cell **H3**? **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(G3, \$B\$4:\$C\$8, 2, FALSE)

(4 marks)

30. What is the **best** formula to use in Cell **I3**? **Note:** You must ensure that your formula can be filled down.

```
=IF (G3=MAX($B$4:$B$8), "Y", "N")
```

(4 marks)

31. What is the **best** formula to use in Cell **G10**?

```
=AVERAGE(G3:G8)
```

(2 marks)