THE UNIVERSITY OF AUCKLAND

FIRST SEMESTER, 2014
Campus: City

COMPUTER SCIENCE

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 - 40	Multiple Choice		80
41	Databases		10
42	XHTML and CSS		10
TOTAL			100

CONTINUED

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] What is the decimal representation of the number represented in binary as 11110?

    (a) 15
    (b) 60
    (c) **30**
    (d) None of the above.

Question 2
[2 marks] Given a machine that uses 4 dials, with each dial containing the digits 0 to 9, how many different numbers can we represent?

    (a) 9,999
    (b) 1,000
    (c) 36
    (d) **10,000**

Question 3
[2 marks] If a program running on a new computer takes 30 minutes to solve a problem today (2014), approximately how long would it take on a computer that will be purchased new 3 years from today (2017)? Hint: use Moore's Law.

    (a) 15 minutes.
    (b) 3 minutes.
    (c) **7.5 minutes.**
    (d) 60 minutes.

Question 4
[2 marks] Which one of the following statements about Solid State devices is FALSE?

    (a) **Although Solid State devices are electronic, they still have some moving mechanical parts.**
    (b) Solid State devices interface to the computer in the same way as magnetic disk drives but there are some differences in the way the operating system handles them.
    (c) USB sticks or flash drives are small solid state drives.
    (d) Solid State devices are still more expensive per GB stored than magnetic disk drives.

Question 5

[2 marks] Software that you can download for free, but have to pay to continue to use after a trial period is called:

    (a) Public domain software.

    (b) Freeware.

    (c) **Shareware.**

    (d) Open-source software.

Question 6

[2 marks] Which one of the following statements about Proprietary Standards is FALSE?

    (a) Usually an intellectual property of an entity.

    (b) **Available to the general public and are developed (or approved) and maintained via a collaborative and consensus driven process.**

    (c) Use of the standard is usually through a licence.

    (d) Less likely to be publicly documented and therefore less future proof.

Question 7

[2 marks] Which of these statements about LAN's is the most accurate?

    (a) A LAN is a network that covers a broad area including links across regional or international boundaries.

    (b) A LAN is a personal area network for interconnecting devices centred on an individual person's workspace in which the connections must be wireless.

    (c) **A LAN is a network that interconnects computers within a limited area and usually operates within a 1 km radius.**

    (d) A LAN is an anonymizing network where connections are made only between trusted peers sometimes called "friends".

Question 8

[2 marks] Which one of the following is NOT an advantage of packet switching?

    (a) It has destination information in each packet, so numerous messages can be sent to many different destinations.

    (b) **It is ideal for communications that require data to be transmitted in real-time.**

    (c) It does not need to form a dedicated continuous connection.

    (d) It only requires damaged packets to be resent and there is no need to resend an entire file.

Question 9

[2 marks] Who sent the first email message from one computer to another over a network?

    (a) Donald Knuth.

    (b) Ward Cunningham.

    (c) George Stibitz.

    (d) **Ray Tomlinson.**

Question 10
[2 marks] Which protocol is used for sending e-mail messages between mail servers?

    (a) **SMTP.**
    (b) HTTP.
    (c) UDP.
    (d) ISP.

Question 11
[2 marks] Which of the following commands would be used to insert a section heading on a page in the Stage One Wiki?

    (a) `==== Section Heading ====`
    (b) `=== Section Heading ===`
    (c) `= Section Heading =`
    (d) **`== Section Heading ==`**

Question 12
[2 marks] Which of the following statements is NOT a criticism from Edward Tufte regarding PowerPoint?

    (a) PowerPoint causes poor presentations and misunderstanding.
    (b) PowerPoint constrains the presenter.
    (c) **There is poor compatibility of PowerPoint presentations amongst different operating systems.**
    (d) Presentation ideas are forced to fit within the PowerPoint limits.

Question 13
[2 marks] Which one of the following statements about good PowerPoint presentation design practices is FALSE?

    (a) Use the same background consistently throughout your presentation.
    (b) It is best not to underline normal text.
    (c) It is best to use a Sans Serif typeface for your slides.
    (d) **Use lots of animation as it always makes your presentation more interesting.**

Question 14
[2 marks] How much memory is required for a 16 colour image 100 pixels wide x 10 pixels high?

    (a) 4000 bytes.
    (b) 2000 bytes.
    (c) **500 bytes.**
    (d) 800 bytes.

Question 15
[2 marks] If you want to display a photograph on your blog, which format would be best?

    (a) **JPG.**
    (b) PNG.
    (c) GIF.
    (d) SVG.

Question 16

[2 marks] Which one of the following companies existed before the rise of modern day personal computers?

   (a) Microsoft.
   (b) Apple.
   (c) **IBM.**
   (d) Google.

Question 17

[2 marks] Which company built the first microprocessor?

   (a) **Intel.**
   (b) Microsoft.
   (c) IBM.
   (d) Apple.

Question 18

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

   (a) The WWW is sometimes abbreviated W3.
   (b) The WWW was created by Tim Berners-Lee.
   (c) **The WWW is another name for the Internet.**
   (d) The protocol used to transfer web pages is HTTP.

Question 19

[2 marks] Which one of the following statements is TRUE?

   (a) **WYSIWYG is an acronym for "What You See Is What You Get".**
   (b) All text editors use a command line interface (CLI); only Microsoft Word uses a graphical user interface (GUI).
   (c) LaTeX is a WYSIWYG editor.
   (d) ASCII is a standard that describes the encoding for 65536 different characters.

Question 20

[2 marks] Which one of the following statements about the Bitcoin is TRUE?

   (a) Bitcoin is illegal in New Zealand.
   (b) **Bitcoin is a peer-to-peer payment system and a digital currency.**
   (c) By 2140 there will be about 21 billion bitcoins.
   (d) Bitcoin is an American digital currency.

Question 21
[2 marks] A peer-to-peer network is a:

    (a) **decentralised and distributed network architecture in which individual nodes in the network act as both suppliers and consumers of resources.**
    (b) decentralised and distributed network architecture in which individual nodes in the network act only as consumers of resources.
    (c) centralised and distributed network architecture in which individual nodes in the network act as both suppliers and consumers of resources.
    (d) decentralised and distributed network architecture in which individual nodes in the network act only as suppliers of resources.

Question 22
[2 marks] A quantum computer is a computation device that makes direct use of quantum-mechanical phenomena, such as:

    (a) entanglement and probability.
    (b) superposition and probability.
    (c) **superposition and entanglement.**
    (d) entanglement and Schrödinger's cat.

Question 23
[2 marks] An ideal pendulum in a vacuum with no friction is oscillating in a vertical plane.
If the support is moved sufficiently slowly, then the motion of the pendulum relative to the support will:

    (a) gradually change.
    (b) **remain unchanged.**
    (c) suddenly change.
    (d) accelerate.

Question 24
[2 marks] Which one of the following statements about LaTeX is FALSE?

    (a) LaTeX automatically generates tables of contents.
    (b) LaTeX automatically generates bibliographies.
    (c) LaTeX automatically generates glossaries.
    (d) **LaTeX automatically generates pictures.**

Question 25
[2 marks] TeX was created by:

    (a) **Donald Knuth.**
    (b) Steve Jobs.
    (c) An anonymous group.
    (d) Leslie Lamport.

Question 26

[2 marks] The LaTeX code: `\begin{displaymath} x = y \end{displaymath}` displays the mathematical formula $x = y$:

    (a) in the centre of the line, and numbers the formula on the right hand side of the line.

    (b) **in the centre of the line.**

    (c) on the right hand side of the line.

    (d) on the left hand side of the line.

Question 27

[2 marks] Which of the following lines of LaTeX code produces the following output?

$$(1 + x + x^2 + x^3 + \ldots)^{\frac{1}{n}}$$

    (a) **`$(1+x+x^2+x^3+\ldots)^{\frac{1}{n}}$`**

    (b) `$\sqrt{(1+x+x^2+x^3+\cdots)}{n}$`

    (c) `$(1+x+x^2+x^3+\cdots)^{\frac{1}{n}}$`

    (d) `$(1+x+x^2+x^3+\cdots)^{1/n}$`

Question 28

[2 marks] Which one of the following lines of LaTeX code contains a CORRECT example of spaces that should not be broken?

    (a) `The lecturer for this lecture is C.^S.^Dell.`

    (b) `The lecturer for this lecture is C.%S.%Dell.`

    (c) **`The lecturer for this lecture is C.~S.~Dell.`**

    (d) `The lecturer for this lecture is C.\S.\Dell.`

Question 29

[2 Marks] What is the output from the following Python code?

```python
print("apple" + "Pie" * 2)
```

    (a) **`applePiePie`**

    (b) `apple Pie apple Pie`

    (c) `applePieapplePie`

    (d) `Error`

Question 30

[2 marks] In Python, how would you get a user's input and assign it to an integer variable named "userAge"?

    (a) `userAge = read("Please enter your age: ")`

    (b) `userAge = integer(read("Please enter your age: "))`

    (c) `userAge = input("Please enter your age: ")`

    (d) **`userAge = int(input("Please enter your age: "))`**

Question 31

[2 marks] Including comments with program code is considered good programming practice. How do you indicate program comments in Python?

    (a) Start the comments line with "!".

    (b) **Start the comments line with a "#".**

    (c) Enclose the comments in square brackets [ ].

    (d) Enclose the comments in quotes " ".

Question 32

[2 marks] The following piece of Python code should determine whether a number is odd or even. Identify the error in the code.

```
if (number % 2 == 0):
    print("You entered the number", number)
    print("That number is even")
else
    print("You entered the number", number)
    print("That number is odd")
```

    (a) "if" and "else" should start with capital letters.

    (b) "number % 2" should be "number / 2".

    (c) There shouldn't be a colon ":" after the if statement.

    (d) **A colon ":" is missing after the word "else".**

Question 33

[2 marks] If you wanted to use Python's library function for random number generation how would you instruct Python to access the functionality?

    (a) **import random**

    (b) use random

    (c) open random

    (d) load random

Question 34

[2 marks] If you wanted to create a spreadsheet chart to show the relationship between several sub-parts and their cumulative total, which would be the best type of chart to choose?

    (a) A scatter plot.

    (b) A line graph.

    (c) **A pie chart.**

    (d) A bar chart.

Question 35

[2 marks] If you needed to show the relationship between height and weight for several people, what would be the best type of spreadsheet chart to use?

    (a) A bar chart.

    (b) A pie chart.

    (c) A trend (regression) line.

    (d) **A scatter plot.**

Note: The following spreadsheet containing information about students is to be used for **both** Questions 36 and 37.

	A	B	C	D	E	F
1	**ID**	**UPI**	**FirstName**	**Surname**		
2	19944	jhod9001	Jacob	Hodson		
3	30311	msmi9032	Michael	Smith		
4	46533	jlee9012	Joshua	Lee		
5	76986	mwen9003	Matthew	Weng		
6	80052	epar9008	Ethan	Park		
7	81206	adav9017	Andrew	Davis		
8	88726	dden9011	Daniel	Denden		
9	95234	whun9034	William	Hung		
10	97374	jfon9002	Joseph	Fong		
11						
12		**Weighting:**	0.5	0.5		
13	**ID**	**FirstName**	**Test**	**Exam**	**Final**	**Passed?**
14	30311	Michael	95	80	87.5	YES
15	76986	Matthew	60	35	47.5	NO
16	81206	Andrew	75	70	72.5	YES
17			76.6666667	61.6666667		

Question 36
[2 marks] What is the best formula to use in Cell **B14** above to obtain the student's first name from the information in Rows 2 - 10, assuming you want this formula to fill down from B14 to B16 correctly?

    (a) `=C2:C10`

    (b) `=$C3`

    (c) **`=VLOOKUP (A14, $A$2:$D$10, 3, FALSE)`**

    (d) `=HLOOKUP (A14, $A$2:$D$10, 3, TRUE)`

Question 37
[2 marks] What is the best formula to use in Cell **F14** above, assuming you want this formula to fill down from F14 to F16 correctly? (Note: the passing mark is 50.)

    (a) **`=IF (E14 >= 50, "YES", "NO")`**

    (b) `=E14 >= 50, "YES", "NO"`

    (c) `=SET (PASS = 50), IF (E14 PASS, "YES", "NO")`

    (d) `=IF (E14 >= 50) THEN (YES) ELSE (NO)`

Given the following spreadsheet:

	A	B	C	D	E	F	G
1							
2	Pay Rate	$18.00					
3							
4	Hours Worked						
5	Mon	Tue	Wed	Thu	Fri	Total	Pay
6	6	7	6	8	8	35	$630.00
7	5	6	6	6	8	31	$558.00
8							
9							

Question 38
[2 marks] Your weekly pay is calculated by multiplying the total number of hours you work in a week by the pay rate as shown in the spreadsheet above. What formula should be in cell **G6** to fill down correctly?

(a) =F6*B2

(b) **=F6*$B$2**

(c) =SUM(A6:E6)*B2

(d) =A6:E6*$B$2

Question 39
[2 marks] Which statement about the Turing Test is TRUE?

(a) **A human tester has to decide whether he is communicating with a machine or a human.**

(b) If a human tester cannot distinguish between a human and a machine, the tester fails the test.

(c) If a test machine mistakes another machine for a human, it fails the test.

(d) A machine has to determine the IQ of a human tester.

Question 40
[2 marks] John Searle created a thought experiment where he sat in a room and was passed messages written in Chinese. He would look up the symbols in a book and write down the corresponding symbols as a reply. To an outside observer it would appear that he understood Chinese. Searle used this thought experiment to illustrate that computers were not intelligent. What was his main point?
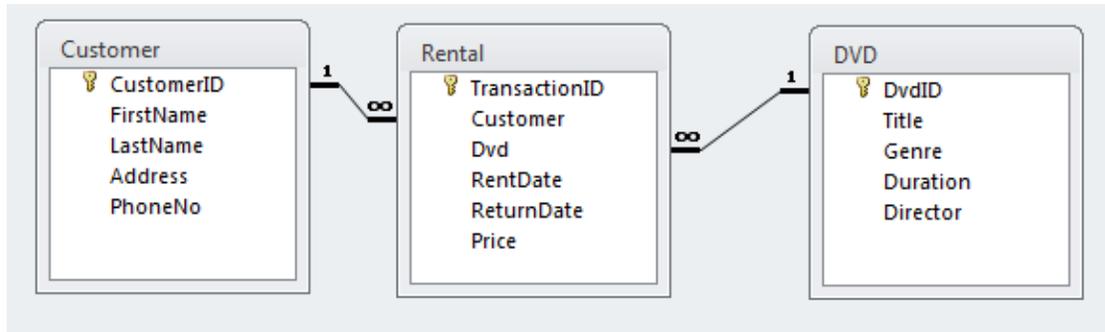
(a) Humans can understand Chinese symbols but computers can't.

(b) Manipulating symbols requires intelligence.

(c) The replies were used to determine if Searle was a human or a computer.

(d) **Computers just manipulate symbols without understanding them.**

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SECTION B

41. Databases (10 marks)

Use the following Microsoft Access relationship diagram to answer the questions in this section. This simple database structure is used by a DVD rental company. Note that the primary key of each table uses the AutoNumber type to ensure uniqueness.

(a) What **foreign keys** (if any) are in the **Rental** table?

Customer

Dvd

(2 marks)

(b) What is the appropriate data type for the **Customer** field in the **Rental** table?

Number

(1 mark)

(c) Fill in the query-by-example (QBE) form below so that it generates a query that will display a list of customers who have rented a DVD directed by Peter Jackson. The list will contain the customer's first name, last name and the title of the DVD rented. An example of the results of the query is given below:

FirstName	LastName	Title
Luke	Skywalker	The Lord of the Rings
Luke	Skywalker	The Hobbit
Leia	Organa	The Hobbit

Field:	FirstName	LastName	Title	Director	
Table:	Customer	Customer	DVD	DVD	
Sort:					
Show:	✓	✓	✓	☐	☐
Criteria:				"Peter Jackson"	
or:					

(4 marks)

(d) Write an SQL expression that lists the Title and Director of all DVD's with the Genre of "SciFic". An example of the results of the query is given below:

Title	Director
Star Wars	George Lucas
The Avengers	Joss Whedon
Divergent	Neil Burger
X-Men: First Class	Matthew Vaughn

```
SELECT Title, Director
FROM DVD
WHERE Genre = "SciFic";
```

(3 marks)

42. 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:

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: (1) The url for the Agents of Shield webpage is:
http://marvel.com/tv/show/190/marvels_agents_of_shield.

(2) The table has a 3 pixel border.

```
<?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>S.H.I.E.L.D.</title>

  <style type="text/css">

  body {
      font-family: sans-serif;
  }
```

```
  h1 {
    text-align: center;
  }

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

  .section {
    border-color: black;
    border-style: solid;
    border-width: thick;
    padding: 15px;
  }

  .background {
    background-color: grey;
    color: white;
  }

  .tableheading {
    font-weight: bold;
  }

  #footer {
    text-align: right;
    font-weight: bold;
  }

  </style>

</head>

<body>

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

```
<h1>S.H.I.E.L.D.</h1>
```

(1 mark)

```
<!-- Introductory Paragraph -->
```

```
<p>
S.H.I.E.L.D. is an espionage and law-
enforcement agency in the Marvel Comics
Universe.
</p>
```

(1 mark)

```
<!--Divisions section-->
```

```html
<div class = "section">

<h2>Divisions</h2>

<p>
The S.H.I.E.L.D. divisions are:
</p>

<ul>
  <li>Psi</li>
  <li>Black-Ops</li>
  <li>Eye</li>
  <li>Combat-Unit</li>
</ul>

</div>
```

(3 marks)

```
<!-- Principal Characters section. -->
```

```html
<div class = "section">

<h2>Principal characters</h2>

<table border = "3px">

  <tr class = "tableheading">
    <td>Characters</td>
    <td>Portrayed By</td>
  </tr>

  <tr>
    <td>Phillip "Phil" Coulson</td>
    <td>Carl Gregg</td>
  </tr>

  <tr>
    <td>Melinda Qiaolian May</td>
    <td>Ming-Na Wen</td>
  </tr>
```

```
  <tr>
     <td>Skye</td>
     <td>Chloe Bennet</td>
  </tr>

</table>
```

(3 marks)

```
<!-- More Information -->
```

```
<p>
More information can be found at:
<a href =
"http://marvel.com/tv/show/190/marvels_agents_of_shield">
Agents of Shield</a>.

</p>

</div>
```

(1 mark)

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

```
<p class = "background" id = "footer">
   Related Topics
</p>
```

(1 mark)

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