

THE UNIVERSITY OF AUCKLAND

SEMESTER ONE 2020

Campus: City

COMPUTER SCIENCE

**An Introduction to Practical Computing
Test**

Sample Answers

NOTE:

This test is out of **50** marks.

Attempt **ALL** questions.

Upload your answers to Canvas as a pdf document.

This test contributes 20% to your final grade.

You will need to put your answers into a Word document and save it as a pdf. Upload the pdf to Canvas, like you do for the labs.

This test has been designed as an open book one hour test. However you have a full 24 hours to work on this test. You are allowed to use the full 24 hours and you are allowed to use books, notes and the internet. It is an open internet/open book test. I confirm that I will not discuss the content of the test with anyone else. I will not give any assistance to another student taking this test. I will not receive any assistance from any person or tutoring service. I will not post any information about this test on the Internet.

The work must be your own. We will run your test through Turnitin. You will be asked to include a sentence which states that the test is your own work.

Answer all questions in a Word document and save as a pdf document. Name your document with your upi followed by CS111Test.pdf e.g., abcd123CS111Test.pdf. Upload the pdf to Canvas.

Q0 [0 marks]

Please include this statement as the answer to question Q0.

“For the 24 hour duration of this test, I, (insert your name here), confirm that I will not discuss the content of the test with anyone else. I will not give any assistance to another student taking this test. I will not receive any assistance from any person or tutoring service. I will not post any information about this test on the Internet.”

Q1 [2 marks]

Gordon Moore stated in his 1965 paper:

“The number of transistors on a single integrated circuit doubles approximately every 18 months, while the price remains the same.”

In recent years it has become difficult to keep up with Moore’s Law as we reach the limits of CPU fabrication technology. As a consequence, modern PCs use multicore processors (i.e., more than one CPU). Describe two of the problems associated with using multicore processors.

Any two from the following:

- Multicore processors generate a lot of heat.
- Multicore processors consume more power.
- Multicore processors require a more complicated operating system to use the cores efficiently

Q2 [2 marks]

Computers use binary (i.e., 1 and 0) to represent information. Explain why a binary system is easier to implement in a computer than a decimal system (i.e., 0 to 9).

Mention both sides:

- It’s much easier for an electronic circuit to detect the presence of absence of an electric current (1 or 0).
- It’s much more complicated to detect the amount of voltage in the current (0 to 9).

Q3 [4 marks]

Discuss why there was an increased need for computation during World War Two (WWII), giving three examples of the need.

Any 3 from the following:

- Cryptography
- Artillery/Naval gun firing tables
- Aerospace engineering
- Atom bomb design

Q4 [4 marks]

What were three of the most significant events in the development of the Internet? Justify your answers.

Any three from the following:

- Packet switching more efficient than circuit switching
- Development of the ARPANET enabling computers across the US and then across the world to be connected
- TCP/IP enables the modern Internet
- Email enables people to send asynchronous messages to each other
- The WWW enables information to be published online and accessed from anywhere
- Cloud computing

Q5 [2 marks]

There are several different types of electronic communication. Explain the difference between asynchronous and synchronous communication, giving an example of each.

- Asynchronous communication means the people communicating with each other do not have to be online at the same time – email
- Synchronous communication requires that people are online simultaneously – instant messaging

Q6 [3 marks]

In 1945 Vannevar Bush described a device called a *memex*. Describe the relationship between his memex and Tim Berners-Lee's World Wide Web.

The memex was a hypothetical device that allowed documents to be linked together in a non-linear way. Rather than reading a document from start to finish you could follow links from one document to another. The WWW is the memex made real.

Q7 [4 marks]

Describe the three steps that could lead to an Enforcement Notice being issued to a person for copyright infringement under the NZ Copyright Act. What are the maximum penalties?

Detection notice, Warning notice, and Enforcement notice. A \$15,000 fine and 6 months Internet ban.

Q8 [2 marks]

What does the acronym WYSIWYG stand for? Describe how a document preparation system like LaTeX primarily differs from a WYSIWYG system.

WYSIWYG = What You See is What you Get,
 LaTeX does not support WYSIWYG, you don't see the formatting until you print.

Q9 [4 marks]

Describe two types of physical problems caused by using computers and digital devices for prolonged periods, giving an example of how to reduce the impact of each.

Any two from: Computer Vision Syndrome, Hearing Loss, and RSI.

Any two sensible methods; better lighting, take breaks, reduce volume, ergonomic workspace etc.

Q10 [3 marks]

What is the main difference between commercial software, shareware and open source software?

Commercial software costs money. Shareware is free but the software typically has restrictions until you buy it. Open source software is free, fully functional and you can modify the source code.

Q11 [3 marks]

Describe three of the advantages of using LaTeX over word processors, like MS Word, particularly for scientific writing.

Any three from:

Excellent tool for mathematical formulae

Works well for large documents

Automatically generates:

- Table of contents
- Lists of figures
- Lists of tables
- Index
- Glossaries
- Bibliographies

Note: Q12-Q17

Questions 12 to 17 refer to the spreadsheet shown below. The spreadsheet lists orders placed at an online web retailer. Customers whose total price is more than \$20 receive their goods at a discounted rate of 90%.

	A	B	C	D	E	F	G	H	I
1	WebRetail Store								
2		Discount Rate: 90%		Sales Tax: 15%					
3									
4		Order #	Customer ID#	Item Cost	Quantity	Total Price	Cost	Tax	
5		1036	7643	\$100.00	1	\$100.00	\$90.00	\$15.00	
6		2743	7067	\$6.00	1	\$6.00	\$6.00	\$0.90	
7		1652	7067	\$12.00	2	\$24.00	\$21.60	\$3.60	
8		1169	7402	\$15.00	1	\$15.00	\$15.00	\$2.25	
9		3587	7768	\$22.00	1	\$22.00	\$19.80	\$3.30	
10		1438	7910	\$3.00	1	\$3.00	\$3.00	\$0.45	
11									
12						Total:	\$155.40	\$0.00	
13									
14		Manufacturers	Totals 2019		Product #	Manufacturer	Total 2019		
15		WebGoods	1500		3895	Acme Inc	2030		
16		Acme Inc	2030		4078	Marshall	700		
17		Marshall	700		1005	SuperC	1700		
18		SuperC	1700		6853	WebGoods	1500		
19		NileRiver	1300		4721	NileRiver	1300		
20		Total:	7230						
21									

Q12 [1 mark]

What is the **best** formula to use in cell F5? The formula **must** be able to be filled down.

= D5 * E5

Q13 [2 marks]

What is the **best** formula to use in cell G12?

= SUM(G5:G10)

Q14 [4 marks]

Cell G5 gives the cost of the order after discounting. If F5 is greater than \$20, then G5 is the total price in F5 multiplied by the discount rate in C2. Otherwise G5 is just the value in F5.

What is the **best** formula to use in cell G5? The formula **must** be able to be filled down.

= IF(F5 > 20, F5 * \$C\$2, F5)

Q15 [2 marks]

What is the **best** formula to use in cell H5? The formula **must** be able to be filled down.

= F5 * \$E\$2

Q16 [3 marks]

Cell H12 gives the total amount of sales tax owing. If the sum of all the individual sales tax amounts in column H is less than \$50, then no sales tax is due. Otherwise H12 is the sum of the individual sales tax amounts.

= IF (SUM(H5:H10) < 50, 0, SUM(H5:H10))

Q17 [5 marks]

Cell G15 looks up the total number of items sold in 2019 for the city given in cell F15.

What is the **best** formula to use in cell G15? The formula must use a VLOOKUP function to get the appropriate value from the table in cells B15:C19, and must be able to be filled down.

= VLOOKUP(F15, \$B\$15:\$C\$19, 2, FALSE)
