

Name: _____

CSC 101 - Quiz 1

Answer **all** of the questions in Part 1, **two** of the questions in Part 2, and **one** question in Part 3.

Part 1

TRUE or FALSE?

(Each question is worth 1 point.)

- (a) A bit is a unit of data that corresponds to one of two potential values, commonly written as 0 or 1.
TRUE
- (b) A hard disk is classified as volatile memory because it requires a constant power supply in order to retain its information.
FALSE
- (c) In order to be classified as a *computer*, a device must have a keyboard and display screen.
FALSE
- (d) The first personal computer was the IBM PC which first hit the market in 1980.
FALSE

Part 2

(Pick **two**. Each question is worth 2 points.)

- (a) What advantages did vacuum tubes provide over electromagnetic relays? What were the disadvantages of vacuum tubes?
Since vacuum tubes had no moving parts, they enabled the switching of electrical signals at speeds far exceeding those of relays. However, vacuum tubes were expensive, required significant power, and tended to burn out frequently.

- (b) What is a transistor and how did the production of transistors lead to faster and cheaper computers?

A transistor is a piece of silicon whose conductivity can be turned on and off using an electric current. Since transistors were smaller, cheaper, more reliable, and more energy-efficient than vacuum tubes, they allowed for the production of more powerful yet inexpensive computers.

- (c) Describe the three essential components of a computer that make up the von Neumann architecture. How do these components work together to produce a machine that can be programmed to complete different tasks?

Input/Output devices allow the user to communicate with the computer by entering commands and then viewing the results. Memory stores information for the computer to process, as well as programs, or instructions specifying the steps necessary to complete specific tasks. Finally, the Central Processing Unit (CPU) is the component that carries out programmatic steps in order to process data.

Part 3

(Pick **one**. Each question is worth 2 points.)

- (a) Consider the following URL:

`http://www.acme.com/products/info.html`

What does each part of this URL represent?

`http://`, specifies that the *HyperText Transfer Protocol* should be used

in communications between the browser and server. `www.acme.com` identifies the Web server that stores the page. `products` is a directory on that server, and `info.html` is the name of the file stored in that directory.

- (b) In what units is CPU speed measured and what does this measurement unit refer to?

CPU speed is generally measured in hertz (Hz), which indicates how many basic instructions a CPU can execute in a second. For example, a 2 GHz CPU can execute approximately 2 billion instructions in a second.

- (c) Computer memory is grouped in bytes, which consist of 8 bits each. How many different values can be represented using a byte? How many different values can be represented using two bytes?

One byte (8 bits) can represent $2^8 = 256$ different values. Two bytes (16 bits) can represent $2^{16} = 65536$ different values.