THE UNIVERSITY COLLEGE OF THE CARIBOO

MIDTERM EXAMINATION
Solutions

COURSE: **COMP 253**   **SEMESTER**: Winter 2005

Part 1 – General Multiple Choice – 24 Marks
Provide the **letter** of the **most correct** answer [1 mark each]

_____ *1.*   *The acronym USB means,*
- a. universal serial bit
- c. unicode service bus
- b. uniform serial bus
- d. none of the above

_____ *2.*   *Which of the following are <u>not</u> primary storage devices? (identify <u>all</u> that apply)*
- a. DIMM
- c. Cache
- b. floppy disks
- d. hard disks

_____ *3.*   *The string for the* **PROMPT** *command that produces a display such as:* `D:\dir_1\files\>`
- a. $directory$>
- c. pg
- b. $e[0m3
- d. d_

_____ *4.*   *What type of power supply has two (2) mainboard power connectors, labelled P8 & P9?*
- a. AT
- c. ATX
- b. all power supplies have many power connectors
- d. power supplies <u>do not</u> connect to mainboards

_____ *5.*   *What part of the hard disk contains the partition table and boot information?*
- a. fat
- c. bootstrap loader
- b. mbr
- d. extended partition

_____ *6.*   *Which DOS statement correctly lists all the files that have the extension .exe?*
- a. show *.exe
- c. cd *exe
- b. dir *.exe
- d. none of the above

_____ *7.*   *In either Linux or DOS, what does the following command accomplish?* `cd ..`
- a. return to root directory
- c. display the current directory
- b. change to parent directory
- d. none of the above

_____ *8.*   *On a drive data cable (or ribbon), the unique red wire signifies,*
- a. the direction of data flow
- c. master or slave setting
- b. connector's side that is towards *power*
- d. connection to pin 1

_____ *9.*   *In Linux, which of the following <u>will not</u> provide help for a command, such as:* "cat"*?*
- a. info cat
- c. cat /?
- b. man cat
- d. cat --help

_____ *10.*   *The CPU must always be told how to look at a bit-word in memory, whether integers, ASCII characters, floating-point, or instructions.*
- a. true
- b. false

____ **11.** **The maximum number of primary partitions on a hard disk is _____.**

a. one
b. two, plus one extended partition
<u>c. four</u>
d. as many as the operating system allows

____ **12.** **The logical partitions, within the extended partition, do not have to use all space in the extended?**

<u>a. true</u>
b. false

____ **13.** **How many drive devices can be connected to a single IDE/EIDE data cable?**

a. 1
b. 4
<u>c. 2</u>
d. it depends: floppy drive or hard drive

____ ~~**14.** **Which of the following is _not an operation of the internal power supply of a tower computer?**~~

a. convert AC to DC
b. cool the system
c. power drives
d. all of the above
<u>e. none of the above</u>

____ **15.** **An error in the magnitude *of numeric representation is called a(n),***

a. underflow error
<u>b. overflow error</u>
c. round-off error
d. magnitude error

____ **16.** **The connection type that has the CPU most physically separated from the rest of the system,**

a. socket
<u>b. slot</u>
c. pin-grid
d. none of the above

____ **17.** **Which is the most recent hard drive addressing (or translation) method?**

a. CHS
b. ECHS
c. LARGE
<u>d. LBA</u>

____ **18.** **L1 cache is located,**

a. on the mainboard
b. either in the cpu or on the mainboard
<u>c. on the cpu die</u>
d. in the CMOS

____ **19.** **Of the expansion slot types below, which could _not have a Network Card installed in it?**

a. ISA
b. PCI
<u>c. AGP</u>
d. EISA

____ **20.** **CMOS is a type of _____.**

a. processor chip
<u>b. memory storage</u>
c. system bus
d. BIOS

____ **21.** **The BIOS-controlled utility that displays summary system information is called the POST or,**

a. pre-defined operation standard
<u>b. power-on self test</u>
c. pattern options system test
d. PO schematic test

____ **22.** **What is the purpose of the Linux command printenv?**

<u>a. display system variable values</u>
b. print out the environment (drives, memory, etc)
c. run the system editor (such as **edit** or **edt**)
d. none of the above

____ **23.** **Which Linux command redirects output of the program** sample **to the file** out.txt**?**

a. ./sample | out.txt
b. less out.txt < ./sample
c. cp sample.txt to out.txt
<u>d. ./sample > out.txt</u>

____ **24.** **The first commercial software product created by Microsoft.**

a. CP/M for the first microcomputers
b. MS-DOS/PC-DOS for IBM PC
<u>c. personal computer BASIC</u>
d. Microsoft WORD

Part 2 - Written Answer – 20 Marks

Place your solutions in the **answer booklet, with one question per page**

Show **ALL** work in calculations.

[2 marks]

1. *Perform the following translations.*

    a) $1011\ 1001_2 = $ __B9__ $_{16}$

    $$1011_2 = B_{16} \quad 1001_2 = 9_{16}$$

    b) $1011\ 1001_2 = $ __271__ $_8$

    $$010_2 = 2_8 \quad 111_2 = 7_8 \quad 001_2 = 1_8$$

    c) assuming an 8-bit word, 2's comp. $1011\ 1001_2 = $ __-71__ $_{10}$

    $$-(2^7) + 2^5 + 2^4 + 2^3 + 2^0 = -128 + 32 + 16 + 8 + 1 = -71_{10}$$

[2 marks]

2. *Translate the following* 8-bit word, 2's complement *binary numbers to <u>decimal</u>.*

    a) 0-bit precision: $0100\ 1101_2 = $ __77__ $_{10}$

    $$2^6 + 2^3 + 2^2 + 2^0 = 64 + 8 + 4 + 1 = 77_{10}$$

    b) 2-bit precision: $0100\ 11.01_2 = $ __19.25__ $_{10}$

    $$2^4 + 2^1 + 2^0 + 2^{-2} = 16 + 2 + 1 + .25 = 77_{10}$$

    or, because 2-bit precision indicates less a factor by 2^2,
    $$77 / 2^2 = 77 / 4 = 19.25_{10}$$

[3 marks]

3. *For both, answer in <u>both</u> binary and the decimal equivalent (using the format shown in class).*

    a) *What is the <u>range</u> of an integer represented by an 8-bit word, 2's comp.?*

    ```
    largest pos:      0111 1111₂  = 127₁₀
    smallest pos:     0000 0001   = 1
    zero:             0000 0000   = 0
    smallest neg:     1111 1111   = -1
    largest neg:      1000 0000   = -128
    ```

    b) *What is the range if the representation is changed to an 8-bit word, 2's comp., with **3-bit precision**?*

    ```
    largest pos:      0111 1.111₂ = 15.875₁₀
    smallest pos:     0000 0.001  = 0.125
    zero:             0000 0.000  = 0.0
    smallest neg:     1111 1.111  = -0.125
    largest neg:      1000 0.000  = -16.0
    ```

[2 marks]
4. *Describe two (2) reasons for using* gold *in computer circuitry.*

- excellent conductor of electricity
- soft, malleable (low energy (heat) required to shape it)
- dense (can be made very thin without breaking, therefore little gold is used)
- contacts remain clean, since it does not oxide (does not react with oxygen, unlike most other metals)

[1 mark]
5. *Describe how each "boot" procedure is performed for,*
   a) cold-boot – pressing the power button

   b) warm-boot – pressing the reset button

   c) soft-boot – pressing CTRL-ALT-DEL in DOS, or telling the OS to restart the computer

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[2 marks]
6. *Mainboard configuration can be done through software, with the BIOS and utilities in the operating system.*
   How can configuration be done physically, and what advantages does this method have over software?
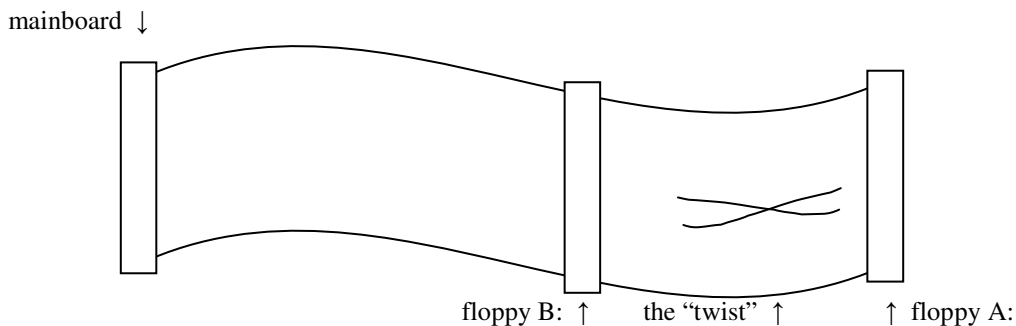
- either using jumpers or DIP switches to create physical circuit connections
- this physical method does not require the BIOS or OS to be running (or working properly); this method is permanent, or until a physical change is made, unlike the BIOS or OS that can be reset

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[2 marks]
7. *What is the purpose of the "twist" on the floppy data cable?*
   Sketch the cable, identifying the twist, the connection to the mainboard, and the two-related floppy drives.

- the twist explicitly describes which drive is floppy A: and floppy B: by their connection on the cable

mainboard ↓

floppy B: ↑   the "twist" ↑   ↑ floppy A:

[2 marks]
8. *What is meant by "partitioning" a hard disk? Which DOS command is used?*
   Also, what is meant by "formatting" a hard disk? Which DOS command is used?

- partitioning organises a single, physical hard disk into one (1) or more logical drives;
  the "drives" can be primary (with a single logical; maximum of 4 primaries) or extended (with more than one logical); the purpose and operation of partitioning is the same regardless of which operating system(s) is used

  -- DOS' fdisk *is used for partitioning; many other utilities exist for partitioning*

- formatting creates the logical cylinders and sectors used to actually store the file data on the disk, all the space is recorded in the file system (or file allocation) table at the beginning of the partition;
  each operating system has its own unique file system

  -- DOS' format *is used to format a partition; each operating system has its own command for this*

[2 marks]

9. *You have been asked to test an old CD-ROM drive unit. Grabbing a DOS/System boot disk, and the CD with the necessary driver file* DRVR121.SYS, *you proceed to install the driver on a blank hard disk and see if the drive works.*

    On the hard disk's C: drive, what are the necessary entries in <u>CONFIG.SYS</u> *and* <u>AUTOEXEC.BAT</u> *to make the CD-ROM drive accesible, <u>and</u> make it respond as drive letter* **W:**?

Config.sys: `device = c:\drvr121.sys` **`/d:SeeDee`**
Autoexec.bat: `c:\mscdex.exe` **`/d:SeeDee`** `/l:W`

[2 marks]

10. *Even though they are primarily learning good program skills, why is it important for computing science students (such as those in CSOM) to also learn about physical computer hardware?*

    ...