# GENERAL KNOWLEDGE

<1>   10 Points – Fill in your answer into the box at the left side of each question. Show your work on the back of a page if you want us to consider partial credit.

FALSE	True or False: A 3½-inch diskette is a "hard disk". While the plastic shell is hard, the interior diskette is "floppy".
6	How many inputs are necessary to have a truth table with 64 rows? The number of rows is 2 raised to the number of inputs, and 2^6=64.
47	Convert 142_5 to decimal (base 10). $142_5 = 1\times5^2 + 4\times5^1 + 2\times5^0 = 1\times25 + 4\times5 + 2\times1 = 25 + 20 + 2 = 47$.
12D	Convert 301_{10} to hexadecimal (base 16). $301_{10} = 1\times16^2 + 2\times16^1 + 13\times16^0 = 12D_{16}$.
A6C	Convert 101001101100_2 to hexadecimal (base 16) using the bit partitioning method. $101001101100 \rightarrow 1010\ \ 0110\ \ 1100$ $1010 \rightarrow 1\times2^3 + 0\times2^2 + 1\times2^1 + 0\times2^0 = 1\times8 + 0\times4 + 1\times2 + 0\times1 = 10$ ***A*** $0110 \rightarrow 0\times2^3 + 1\times2^2 + 1\times2^1 + 0\times2^0 = 0\times8 + 1\times4 + 1\times2 + 0\times1 = 6$ ***6*** $1100 \rightarrow 1\times2^3 + 1\times2^2 + 0\times2^1 + 0\times2^0 = 1\times8 + 1\times4 + 0\times2 + 0\times1 = 12$ ***C***
101010	Add the binary numbers 10011_2 and 10111_2 and show the result in binary. • • • • ← Carries 10011 10111 ——— 101010
Yellow -or- Greenish Yellow	Approximately what color is represented by the HTML color code "C3EA1F" R = C3 = $C\times16^1 + 3\times16^0$ = $12\times16 + 3\times1$ = 192+3 = 195 "High" G = EA = $E\times16^1 + A\times16^0$ = $14\times16 + 10\times1$ = 224+10 = 234 "High" B = 1F = $1\times16^1 + F\times16^0$ = $1\times16 + 15\times1$ = 16+15 = 31 "Low" High Red + High Green + Low Blue = Yellow. Actual Color = "#C3EA1F"
3000000 (three million)	Approximately how many bytes in size is a .BMP file for a 24-bit per pixel image that is 1000 by 1000 pixels? $1000\times1000\times3$ bytes per pixel = 3,000,000 bytes
.JPG or .PNG	I have a .BMP of a scanned photograph that I want to compress by using a better image format. What file format should I convert it to? Since this is a photograph you will need to support millions of colors, so .GIF is not a good choice. Both .JPG (lossy compression) and .PNG (lossless compression) handle photographs well.
.GIF or .PNG	I have a .BMP of a cartoon containing fewer than 10 colors that I also want to compress. What file format should I convert it to? Since both .GIF and .PNG are lossless, either will do fine here.

<2>   4 Points – Trace the following gate circuit and show its output for all combinations of input values.

Input		Output
A	B	You Fill In
0	0	1
0	1	0
1	0	0
1	1	1
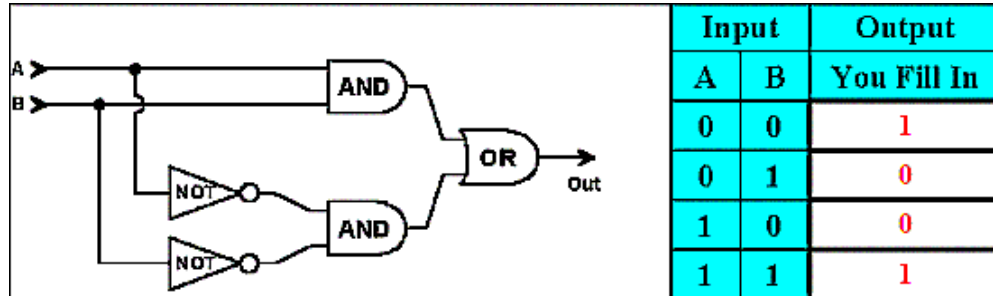
<3>   3 Points – I have two floppy disks, one I know to be a Double Density (720K) disk and the other a High Density (1.44M) disk. How can I tell the difference between the two disks?

The High Density disk has "HD" embossed into the plastic shell, and has an extra hole in the corner opposite the file-protect tab. The Double Density disk has a plain shell and no extra hole.

<4>   4 Points – Short answer. In Windows, characters in typefaces are stored as sets of Bézier curves (or similar curves called Quadratic Splines). In the old days fonts were defined by simple bitmap images of each character. What is the big advantage gained by defining character shapes as mathematical curves instead of as bitmaps?

With the mathematical curves you can **_scale_** the outlines of the typefaces to any point size and still retain the same shape. You can also mathematically warp the typefaces (make them italic, for example) with the same ease. As you make a bitmap larger, the corners become more pronounced.

MS-DOS

<5>   4 Points – My current prompt is A:\JUNK>, and the indicated subdirectory also contains an inner JUNK subdirectory (just like the MS-DOS homework assignment). What is the difference between typing the command **CD JUNK** and typing the command **CD \JUNK** at the prompt? What will the resulting prompt be after each one?

CD JUNK with no leading backslash goes down into the innermost JUNK folder (the prompt will be A:\JUNK\JUNK>), while CD \JUNK goes back up to the root and then down into the outermost JUNK (or A:\JUNK>, the same place as when you started). Anyone who answered FROG didn't understand the question!

<6>   3 Points – In Windows I create a file called **My Spreadsheet.xls** (a long filename containing blanks). What will be the filename in a classic 8.3 MS-DOS system?

The rule is to take the first six <u>non-blank</u> characters of the original file name, and then append a tilde and a sequence number. In this case, the name will be `MYSPRE~1.XLS` (all upper case).

<7>   2 Points – If you take a computer to a service center and they ask what folders on the hard disk need to be backed up, how would you describe "the folder called Classes on the root of the hard disk" by writing down just its MS-DOS path name?

<div align="center"><code>C:\CLASSES</code></div>

The hard disk is always drive `C:`, the root is indicated by the backslash, and then the folder is called `CLASSES`. I actually had a problem with this recently when I took a computer in for service; the technician asked me which folders on the hard disk should be backed up and I wrote down the MS-DOS paths that perfectly described where each one was located, one of which was `C:\CLASSES`. The technician asked "are those folders?" He didn't know the MS-DOS method of specifying paths!

UNIX & THE INTERNET

<8>   8 Points – Find and correct the errors in the following web page. Indicate errors by circling them, and write next to each what the correction should be.

```
<HTML>
      <HEAD>
            <TITLE>A Wonderful Web Page</TITLE>
      </HEAD>

      <BODY BGCOLOR="#808080">
            <IMG SCRSRC="Flower.jpg" ALT="A very nice picture">
            <CENTER>
                  <H1>News</H1>
                  <A HREF="http://www.cnn.com">
                        Click here for the news
                  </A>
            </CENTER>
            I hope you <B><I>like</B></I></I></B> my web page.   I
            will be
            changing it a lot over the next few weeks.
      </BODY>
</HTML>
```

Lots of missing / and ", a missing `</TITLE>`, `SRC` misspelled, and closing tags out of order. By my count there were 11 sets of answers, so this question could have received 3 points of extra credit.

<9>   4 Points – I want to change the permissions on the image file `junk.jpg` from `r------w-` to `rw-r--r--` by using both the symbolic form and the absolute form of the `chmod` command. Fill in the blanks below with the appropriate coding for each form.

(Symbolic)   chmod   u+w,go+r,o-w   junk.jpg

(Absolute)   chmod   644   junk.jpg

Note that for the symbolic method we would also accept `u+w,a+r,o-w` as well.

<10> 5 Points – Short answer. Why should I use an "encrypted" telnet application such as SecureCRT or PuTTY instead of the standard telnet program that comes with Windows?

To avoid having "packet sniffers" (unauthorized network interceptor programs) pick up plain text passwords or other sensitive information.

<11> 3 Points – I create a web page on my PC in Notepad, and then use FTP to put it onto my UNIX account. Unfortunately, my web page still does not appear when I point a browser at the correct address. Name 3 possibilities why this error might occur (extra credit for more than 3 valid reasons).

1.   Wrong permissions on `index.html`

2.   Wrong permissions on `.` (home directory).

3.   Wrong permissions on `public_html`

4.   File not called `index.html` (different filename or capitalization).

5.   File put into wrong place in the UNIX account (home directory instead of in `public_html`).

6.   The `public_html` directory doesn't exist, or it has the wrong name or capitalization.

MICROSOFT WINDOWS & ACCESSORIES

<12> 8 Points – In the image below, please indicate each of the following items:

A.	A minimize button	E.	A folder icon (not a shortcut)
B.	A maximize button	F.	An inactive title bar
C.	A close button	G.	The active title bar
D.	A shortcut icon to a folder	H.	A shortcut icon to a program
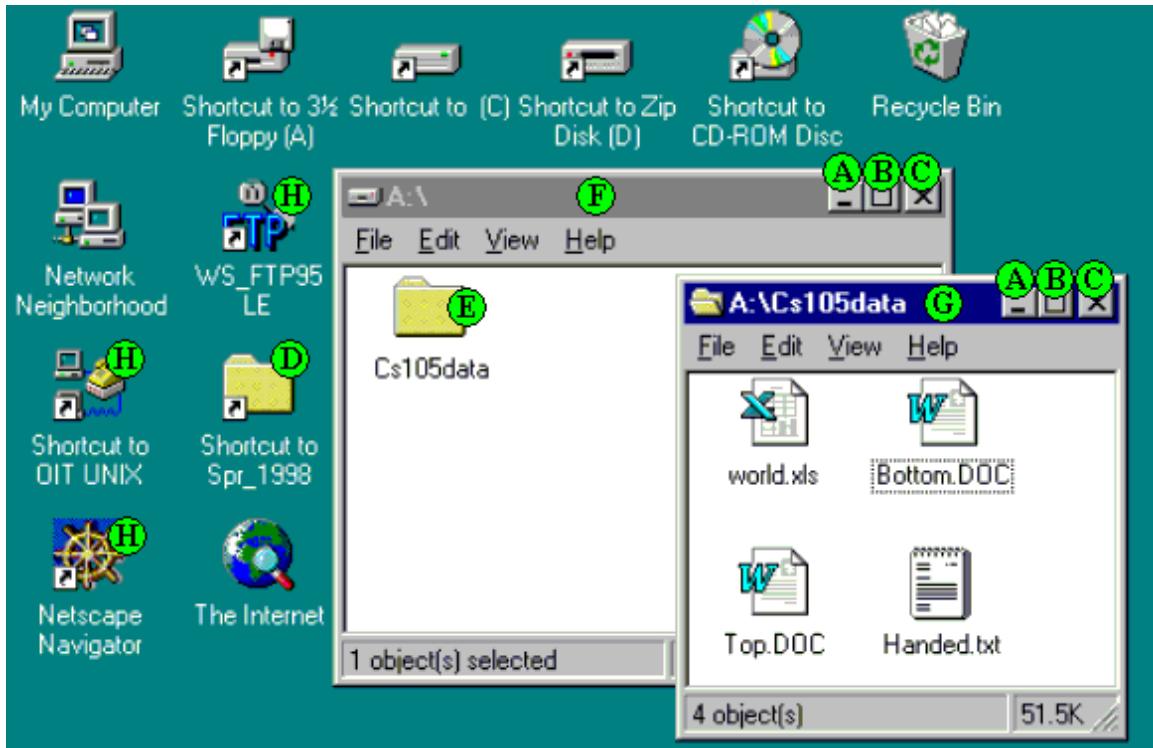
<13> 4 Points – Short answer. Using the same image above, I grab the Handed.txt file by click-dragging it with the left mouse button; but dropping it onto the A:\ folder will result in *different* behavior from dropping it onto the desktop. What is that difference? Describe what happens in each case.

Since A:\ is on the same disk as the source of the file (A:\Cs105data) the file will be ___*moved*___ to that location, but since the desktop is on the C: drive the file will be ___*copied*___ to that location.

<14> 2 Points – A copy of Windows Paint and a copy of Windows Notepad is running. In Windows Paint I copy a chunk of the current picture to the clipboard.

1.   What happens to the previous contents of the clipboard?

      The previous contents will be erased.

2.   Will the Edit-Paste menu entry in Notepad appear gray or black?

      Gray! The object in the clipboard is a chunk of graphics from the Paint program, but Notepad can handle text only, not graphics. Since Notepad cannot handle what is currently in the clipboard, its Edit-Paste entry will be gray, not black.

<15> 4 Points – In the following Notepad image, why are the Cut and Copy menu entries gray instead of black?
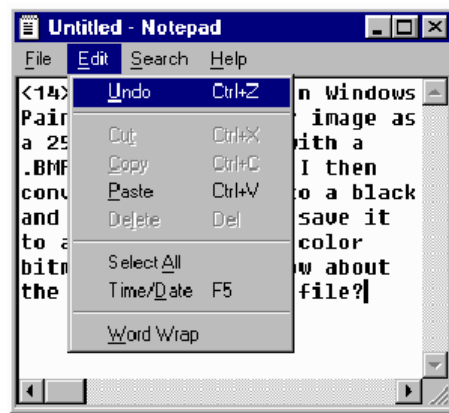
Cut and Copy are gray because ***nothing is selected***, and so nothing can be cut or copied at the current time. (The cursor is just after the question mark on the last line of the image, and does not cover any characters. It has zero width.) Note that this question has nothing to do with the clipboard or what is in it right now.

WORD PROCESSING

<16> 5 Points – Short answer. What are the differences between a text editor (such as Notepad or emacs) and a word processor (such as Microsoft Word)? What are the benefits of each?

A text editor can edit text only, and has no formatting attributes (i.e., you cannot make certain pieces bold or italic or in a different font). A word processor includes all the formatting attributes in the file along with the text. Text editors are very good for dashing off quick notes, writing web pages, or writing computer programs, where in each case the written text is the only thing allowed in the file. Word processors are used wherever text must be correctly formatted on a character-by-character, paragraph-by-paragraph, or page-by-page basis (letters, books, term papers, etc.).

<17> 4 Points – A standard piece of printer paper is 11 inches from top to bottom. Assuming that there is a one inch margin around all four sides and there is no blank space between lines, how many lines of a 24 point font can I fit onto that piece of paper?

The paper is 11 inches tall, but has a 1 inch top margin and a 1 inch bottom margin, so there are 9 inches of paper left in which to write text. A 24 point font is 24/72 = ⅓ inch from the top of the ascender to the bottom of the descender. Therefore, 9 inches ÷ ⅓ inch per line = **_27 lines_**. Note that in practice you will never get 27 lines, as there is extra white space separating each pair of lines that you generally cannot eliminate.

<18> 3 Points – Show three ways to turn a 5 page term paper into a 6 page term paper.

1.   Increase the point size of the font (usually not over 14 points).

2.   Increase the spacing between lines (to line-and-a-half or double space).

3.   Increase the margins.

4.   Select a wider font.

<19> 2 Points – Show in the following picture the points where *kerning* has occurred.

Kerning (overlap of characters to eliminate white space) occurs between the W and A, and between the A and Y.

<20> 2 Points – In the sign just above, does the typeface have serifs, or is it sans-serif?

It is sans-serif (there are no pointy bits at the corners of the characters).

SPREADSHEETS

<21> 4 Points – Parenthesize the following expression to show how it will be evaluated by a spreadsheet. Use as many parentheses as necessary to show the complete order of evaluation.

```
(((5 + ((3 * 6) / (7 ^ 9))) − 4) + (2 * 8))
```

<22> 4 Points – Write a valid Excel formula to compute the following expression (cells A1, B3, D2, and F7 all contain numeric values):

$$\sqrt{\dfrac{\text{A1-B3}}{\text{D2+F7}}}$$

=SQRT((A1-B3)/(D2+F7))

Note that the inner sets of parentheses are critical. Without them, as in the incorrect answer =SQRT(A1-B3/D2+F7), the division would be computed *before* either the addition or the subtraction.

<23> 4 Points – Cell **Z99** contains the formula:

=(X90+85*AA100*SUM(V101:W104)-F86+$A95)

which is then copied to cell **AC102**. What is the resulting formula in cell **AC102** after the copy has been completed?

The copy is going from Z99 right three columns and down three rows to AC102, so each relative piece goes right three, down three as well. The 85 is a constant (not a cell address), the F86 is an absolute cell address, and the $A part of $A95 is also absolute, and do not change. The changes are as follows:

X90	→	AA93,
AA100	→	AD103,
V101	→	Y104,
W104	→	Z107,
row 95	→	98.

Partial credit for: **=(____+85*_____*SUM(____:____)-F86+$A__)**

Full credit for: **=(AA93+85*AD103*SUM(Y104:Z107)-F86+$A98)**

<24> 4 Points – Write a valid Excel formula using the IF function that returns the value "Yes" if the sum of cells A1, A2, A3, A4, B1, B2, B3, and B4 is greater than zero, and returns "No" otherwise.

=IF(SUM(A1:B4)>0, "Yes", "No")

=IF((A1+A2+A3+A4+B1+B2+B3+B4)>0, "Yes", "No")