

CMPSCI 105 Midterm Exam Solution

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GENERAL KNOWLEDGE

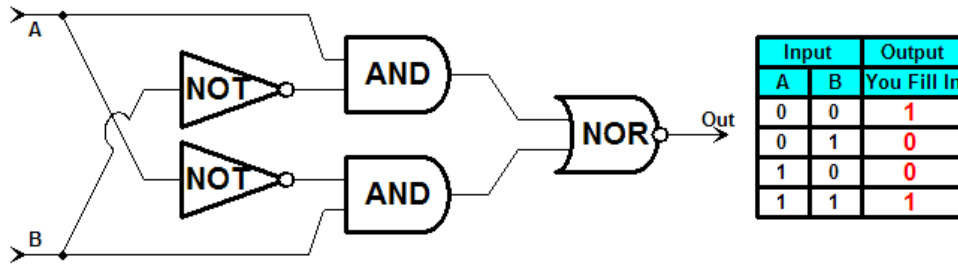
<1> 8 Points – Fill in your answer into the box at the left side of each question. Show your work on the back of a page if you want us to consider partial credit.

False	True or False: A 3½-inch diskette is a “hard disk”.
7	I have an OR gate with 3 inputs. How many rows in the truth table for this gate will have an output value of 1 (true)?
114	Convert 424_5 to decimal (base 10). $4 \times 5^2 + 2 \times 5^1 + 4 \times 5^0 = 4 \times 25 + 2 \times 5 + 4 \times 1 = 100 + 10 + 4 = 114$
20F	Convert 527_{10} to hexadecimal (base 16). $20F = 2 \times 16^2 + 0 \times 16^1 + 15 \times 16^0 = 2 \times 256 + 0 \times 16 + 15 \times 1 = 512 + 0 + 15$
D7E	Convert 110101111110_2 to hexadecimal (base 16) using the bit partitioning method. $1101-0111-1110 = 13-7-14 = D7E$
101001	Add the binary numbers 10110_2 and 10011_2 and show the result in binary.
674	What is the octal (base 8) number code that corresponds to the UNIX permissions $rw-rwxr--$? $rw-rwxr-- = 110111100 = 110-111-100 = 674_{10}$
.JPG	A .BMP file contains a scan of a photograph of a natural scene. For web use, should I convert the image into .GIF or .JPG format?

<2> 4 Points – An HTML color on a web page is defined as "#C1D30E".

193	What is the decimal value of the Red component of the color? $C1 = C \times 16^1 + 1 \times 16^0 = 12 \times 16 + 1 \times 1 = 192 + 1 = 193$
211	What is the decimal value of the Green component of the color? $D3 = D \times 16^1 + 3 \times 16^0 = 13 \times 16 + 3 \times 1 = 208 + 3 = 211$
14	What is the decimal value of the Blue component of the color? $0E = 0 \times 16^1 + E \times 16^0 = 0 \times 16 + 14 \times 1 = 0 + 14 = 14$
Yellow	What is the approximate true color being specified here? High Red + High Green + Low Blue = Yellow

- <3> 4 Points – Trace the following gate circuit and show its output for all combinations of input values.



- <4> 2 Points – I slide the file protect tab on my floppy disk so that I can see light through the hole. What does this mean?

It means that the floppy is **write-protected**, and that no files on the disk may be modified and no files may be added to the disk. (Sliding the tab so that no light shines through the hole removes the write-protection.)

UNIX & THE INTERNET

- <5> 8 Points – Examine the following web page. In the HTML page below there are a bunch of mistakes. Find and fix each one (write the correct code nearby).

```
<HTML>
  <HEAD>
    <TITLE>My Spiffy Web Page</TITLE>
  </HEAD>

  <BODY BGCOLOR="#BC01EH">           (H is not legal hexadecimal)
    <CENTER>
      <H1>Welcome!</H2></H1>
      <IMG SRC="Froggy.gif" ALT="A very nice frog">
    </CENTER>

    Welcome to my web page! I hope you like it!
    Please come <B><I>back</I></B> soon!

    <A HREF="http://www.cnn.com/">
      Click here for the News
    </A>
  </BODY>
</HTML>
```

<6> 4 Points – I want to change the permissions on the subdirectory `xyz.txt` from `rw-rw----` to `r--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 ug-w, o+r xyz.txt`

(Absolute) `chmod 444 xyz.txt`

<7> 3 Points – How is MS-DOS similar to and different from UNIX?

Both are command line interfaces, but MS-DOS is single user and UNIX supports multiprogramming (many users at the same time). Both separate file paths with slash characters, but MS-DOS uses `\` while UNIX uses the `/` character. Both have the `cd`, `mkdir`, and `rmdir` commands, as well as other similar commands, but UNIX also requires that a user log in and log out.

<8> 4 Points – In the past few years we've had to switch from using telnet to programs such as PuTTY or SecureCRT, and in the next few months we'll have to switch away from using ftp and WS_FTP for the same reason. What is that reason? Why must we abandon the use of "standard" telnet and ftp?

Security – *packet sniffer* programs can steal passwords on plain-text transmissions in both standard telnet and ftp. SecureCRT, PuTTY, etc. *encrypt* all communications.

<9> 4 Points – It is 7:00am here on the East Coast, and there is a multi-megabyte file that I want to download to my computer. Should I download that file from Germany, or from Oregon? Why would you choose one over the other?

Oregon, it is 4:00am there and network traffic is low (Germany is in the middle of their business day, which is a high-traffic time).

MICROSOFT WINDOWS & ACCESSORIES

<10> 2 Points – I have two folders open on screen, and I want to move a file from one to the other. Unfortunately, I'm so tired I do not remember if the two folders are on the same disk drive or on different drives. How do I approach the task of moving the file so I don't have to know which drive each folder is on?

Right-click-drag the file, then answer "MOVE" from the pop-up menu. (If the folders are on the same drive Windows will move the file, but if they are on different drives Windows will copy the file, and if the file is an `.EXE` Windows will create a shortcut. Right-click drag removes the ambiguity.)

<11> 4 Points – I have two folder windows open on screen side-by-side (not overlapping). Describe two different ways of knowing which one of the two is the active window.

1. Title bar on active window is dark.
2. Task bar button is pushed in on active window.

<12> 4 Points – In Notepad, I select some text with the mouse, then click on Edit in the menu. I notice that the Edit-Paste menu entry is gray. What does this mean?

There is nothing in the clipboard to paste (or there is nothing in the clipboard that Notepad knows how to paste, such as an image). The fact that the text is selected is a red herring and does not bear on this problem.

WORD PROCESSING

<13> 4 Points – What are the differences between **text editors** (such as emacs or Notepad) and **word processors** (such as Word or Wordpad)? What can each do that the other cannot?

Text Editors: Edit plain text only (no formatting), and must hit ENTER at the end of each line. They are great for short documents, email text bodies, HTML web pages, and programs.

Word Processors: Edit text, plus allows embedded formatting for words, paragraphs, and whole documents. They support word-wrap, margins, and different typefaces in the same document.

<14> 4 Points – I create a document in Word that I wish to distribute over the Web, but I want to make certain that nobody can change my words and republish the document as if it was their own. What must I do to both publish the document on the Web and protect my intellectual property?

Save the document as .PDF (Acrobat) files, then set the security on the .PDF to read-only and set a password to lockout any changes.

Alternatively, save each page in the document as a .GIF image, with a watermark.

- <15> 4 Points – Typeface outlines are defined by Bézier curves (and related curves called Quadratic Splines). What are the advantages of this method over storing character glyphs as bitmaps?

You can scale typefaces to any size and the shape stays smooth at all sizes. Bitmaps just get jaggier.

- <16> 7 Points – Which of the following typefaces have serifs and which are sans-serif? Which are proportionally spaced and which are monospaced?

Times Roman
Arial
Courier
Arial Narrow
System
STENCIL
Rockwell

Times Roman, Courier, Stencil, and Rockwell all have serifs, while Arial, Arial Narrow, and System are all sans-serif. Courier is the only monospaced typeface here; all others are proportionally spaced.

SPREADSHEETS

- <17> 8 Points – The spreadsheet model on the left shows a block of data about to be sorted. Fill in the blank spreadsheet model on the right to show the result of the sort.

	A	B
1	Widgets	Gadgets
2	3	2
3	6	1
4	2	1
5	1	2
6	4	2
7	5	1
8	2	2
9	1	1
10	4	1

	A	B
1	Widgets	Gadgets
2	6	1
3	5	1
4	4	1
5	2	1
6	1	1
7	4	2
8	3	2
9	2	2
10	1	2

In this problem Widgets and Gadgets are *not* independent of one another; within a block to be sorted the rows act just like the records in a database table. If you move a Gadget, you must also move its corresponding Widget. Sorting the Gadgets in ascending order is pretty easy, since all the 1s appear above all the 2s, but if you look at the dialog box you will see that the “Then by” box contains Widgets – if two Gadgets have the same value then their corresponding Widgets are sorted in descending order.

- <18> 4 Points – Write a complete, valid Excel formula to compute the following expression:

$$\frac{\sqrt{5}+1}{2}$$

$$= (\text{SQRT}(5) + 1) / 2$$

You cannot use the square-root symbol $\sqrt{\quad}$ in an Excel function (darn it), but must spell out the name of the function instead. Similarly, you cannot use the \div symbol for division. You must include an extra set of parentheses around the numerator so that the addition is performed before the division.

<19> 4 Points – Cell **S9** contains the formula:

= (X2+\$B\$7-SUM(\$X5:\$Z7) *15/SQRT(Q8))

which is then copied to cell **Z15**. What is the resulting formula in cell **Z15** after the copy has been completed?

Partial credit for:

= (___+\$B\$7-SUM(\$X___:\$Z___) *15/SQRT(___))

Full credit for:

= (AE8+\$B\$7-SUM(\$X11:\$Z13) *15/SQRT(X14))

The formula is being copied to the right 7 columns (from S to Z) and down 6 rows (from 9 to 15), so every relative component is shifted by the same amount.

Cell X2 + <right 7, down 6> = AE8 (columns go ... X Y Z AA AB ...),

Row 5 + <down 6> = row 11,

Row 7 + <down 6> = row 13, and

Cell Q8 + <right 7, down 6> = X14.

<20> 2 Points – If the formula **=NOW()** shows up on screen as March 25, 2004, what would show up on screen for the formula **=NOW()+9** ?

March 25, 2004 + 9 (days) = "March 34, 2004" = April 3, 2004

<21> 6 Points – Write a complete Excel formula using two **IF** functions that returns the value "Small" if the number in cell A1 is less than zero, returns "Big" if the number in cell A1 is greater than zero, and returns "Same" if the number in cell A1 is exactly equal to zero.

Any solution isomorphic to one of the following is acceptable:

=IF(A1<0, "Small", IF(A1>0, "Big", "Same"))

=IF(A1>0, "Big", IF(A1<0, "Small", "Same"))

=IF(A1=0, "Same", IF(A1<0, "Small", "Big"))

<22> 6 Points – The cursor is on notebook page **Calculations**. Write a formula in the current cell using an Excel function to add up all cells from the **Input Output** page in the range from J10 through M15.

=SUM('Input Output'!J10:M15)