

CMPSCI 105 Midterm Exam
Spring 2015
March 5, 2015
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**OPEN BOOK, OPEN NOTES, NO ELECTRONIC AIDS.
TURN OFF CELL PHONES!!!**

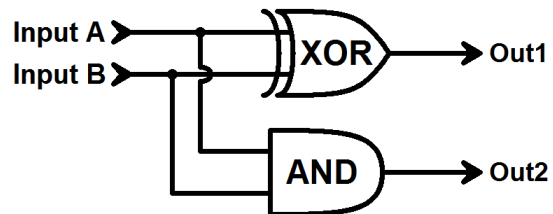
<1> 15 Points – (1 point each) – Fill in your answer into the box at the left side of each question. Show your work on the back of a page if you want us to consider partial credit. **Pick any 15 problems.** For extra credit, you may do more than 15.

FALSE	1. True or False: A 3½-inch diskette is a “hard disk”.
FALSE	2. True or False: A USB flash drive is a “hard disk”.
FALSE	3. True or False: The decimal value of the square-root-of-2 (that is, the $\sqrt{2}$) can be converted to binary with a <u>fixed</u> number of bits.
$2^5 = 32$	4. How many different binary patterns can be expressed with 5 bits?
$2^5 - 1 = 31$	5. What is the largest unsigned number that will fit into 5 bits?
$+(2^{5-1} - 1) = +15$	6. What is the largest signed number that will fit into 5 bits?
$-(2^{5-1}) = -16$	7. What is the smallest signed number that will fit into 5 bits?
132	8. Convert the decimal (base 10) number 42 into base 5. $1 \times 5^2 + 3 \times 5^1 + 2 \times 5^0 = 25 + 15 + 2 = 42.$
B3	9. Convert the binary (base 2) number 10110011_2 into hexadecimal (base 16) using the bit-partitioning method. 1011 0011
263	10. Convert the binary (base 2) number 10110011_2 into octal (base 8) using the bit-partitioning method. 10 110 011
11100001	11. What is the sum in binary (base 2) of the two binary numbers 10110011_2 and 00101110_2 ?
8+5i	12. What is the sum of complex numbers 4-2i and 4+7i ? Add real parts and imaginary parts separately.
26+7i	13. What is the product of complex numbers 3-4i and 2+5i ? FOIL: $3 \times 2 = 6$, $3 \times 5i = 15i$, $-4i \times 2 = -8i$, $-4i \times 5i = -20i^2 = +20$
integer	14. Is the product of (3-8i) and (3+8i) an integer , rational , irrational , or complex ? Imaginary components cancel.
3	15. The log base 5 of the number 42_{10} is approximately 2.32 – how many digits are needed when converting 42 into base 5? $\lceil 2.32 \rceil = 3$
444	16. In UNIX command <code>chmod _____ filename</code> what must be in the blank to set permissions to r--r--r-- ?
go-r	17. In UNIX command <code>chmod _____ filename</code> what must be in the blank to deny read permission from group and others ?
.OR.US	18. Two servers hold identical files, one in .OR.US and one in .UK . At 9:00am at UMass, from which should I get a file? The UK is in mid business day, but Oregon hasn't woken up.
NO	19. Fred loses his elsrv3 password. Can anyone recover his old password for him? Passwords can be set, but not recovered.
YES	20. Yes or No: Can I have a telnet connection through PuTTY on a Windows system and a Fugu connection on a Mac open to the same account on the same server at the same time? UNIX is multitasking, and doesn't care what connects to it.

<2> 3 Points – Short Answer. I'm connected to the `elsrv3` server through PuTTY or Terminal/ssh, and have made several changes to the files via emacs, but my changes are not visible when I look at the files with the same names on my laptop. Why not? Explain.

In lab #1, students created the `index.html` file, and moved it to the server in lab #2. There are thus two separate copies of this file. By editing the files directly on the server with emacs, the corresponding files on the laptop are not modified.

<3> 8 Points – Trace the following gate circuit and show its output for all combinations of input values.



In		Out2	Out1
A	B		
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	0

<4> 4 Points – A Web page contains the hexadecimal color `#00FA9A`.

- A. (1 point) What is the decimal (base 10) value for the red component? **0**
- B. (1 point) What is the decimal (base 10) value for the green component? **250**
- C. (1 point) What is the decimal (base 10) value for the blue component? **154**
- D. (1 point) Approximately what visible color is shown on screen?

greenish-blue, teal, etc. **MediumSpringGreen** is the named color.

<5> 5 Points – Check off all graphics file format(s) that are appropriate for the described tasks. There may be more than one checkmark per row.

	.BMP	.JPG	.GIF	.PNG	.SVG
Photographs of natural scenes	✓	✓	maybe	✓	
Cartoons with transparency			✓	✓	
Simple animations			✓		
Line art that looks the same at any size					✓
A drawing with surrounding text	✓	poor	✓	✓	✓

- <6> 6 Points – Fill in the blanks so that the graphics file **Mister Spock.jpg** is shown on screen at 640x480 pixels, with mouse fly-over text set to **Live Long and Prosper**, the text to show when the graphics file cannot be shown set to **Vulcan Ambassador**, and the hypertext target set to **en.wikipedia.org/wiki/Leonard_Nimoy**

```
<A HREF="http://en.wikipedia.org/wiki/Leonard_Nimoy">  
  <IMG SRC="Mister%20Spock.jpg"  
    WIDTH="640"  
    HEIGHT="480"  
    TITLE="Live Long and Prosper"  
    ALT="Vulcan Ambassador">  
</A>
```

- <7> 9 Points – On my account (**verts**) on the class server (**elsrv3**), I have a file called **index.html** in the folder called **personal**, which is a subfolder of **public_html**. Which of the following URLs correctly point to this file (may be more than one) and which do not? Write YES or NO next to each address (in blue). If NO, indicate where the address is incorrect (in red) (new text in green).

N <http://www-elsrv3.cs.umass.edu/~verts/personal/index.html>

Y <http://elsrv3.cs.umass.edu/~verts/personal/>

Y <http://elsrv3.cs.umass.edu/~verts/personal/index.html>

N <http://www-elsrv3.cs.umass.edu/~verts/personal/>

N <http://elsrv3.cs.umass.edu/~verts/personal/>

N http://elsrv3.cs.umass.edu/~verts/public_html/personal/

N <http://elsrv3.cs.umass.edu/~verts/personal/index.html>

N <http://www-cs.umass.edu/~verts/personal/>

N <http://elserv3.cs.umass.edu/~verts/personal/>

<8> 10 Points – Each of the following HTML items may (or may not) contain an error. If there is an error, correct it. If there is no error, write “none” in the box.

	Missing > at end
<B I>bold and italic</I B>	<I> ... </I>
	Missing " around frog.gif
<H1>Hello</H1>	none
<BODY BGCOLOR="#0000000">	Too many zeroes
<BOLD>	Should be not <BOLD>
<BR / BR>	Either or or
<P STYLE="color:blue">	none (local style override on paragraph)
<I>Frog</U>	Either <I>Frog</I> or <U>Frog</U>
<BODY LINK="#F0F0F0">	Missing # on color

<9> 15 Points – Write a complete and well-structured STYLE block (not a complete Web page) with the following content:

1. The background color of the Web page must be defined to be **yellow**,
2. All **H1** and all **H2** headings must be centered, in the Arial typeface, and **red**,
3. All **P** (paragraphs) must be fully-justified.

```
<STYLE TYPE="text/css">

    BODY {background-color:yellow}

    H1, H2 {text-align:center ;
           font-family:'Arial' ;
           color:red}

    P {text-align:justify}

</STYLE>
```

<10> 10 Points – Find and correct all of the syntax errors in the following .SVG file that cause it to fail to be displayed. There are at least ten mistakes. There will be a penalty of -1 point for each correct item misidentified as an error, but +½ point extra credit for each correctly found error more than ten. Remember that presentation attributes like **fill**, **stroke**, **stroke-width**, and **stroke-linejoin** are all optional, and the presence or absence of one or more of these is not an error.

Missing characters shown in red, characters to delete are shown in red with ~~strikethrough~~, and other errors (such as transpositions or incorrect characters) shown in blue.

```
<?xml version="1.0" enocoding="UTF-8" standalone="no"?>

<!-- Copyright 2015 William T. Verts -->

<svg
  xmlns:svg="http://www.w3.org/2000/svg"
  xmlns:"http://wwww.w3.org/2000/svg"
  verison="1.1"
  x="0px"
  y="0px"
  width="320px"
  height="240px">

  <rect
    x="0" y="0" width="320" height="140"
    fill="#00FFFF"/>

  <line x1="0" y1="140" x2="320" y2="140"
    stroke="black" stroke-width="3"/>

  <polygon      (or polyline)
    points="250,100 190,160 310,160 250,100"
    fill="#00F080"
    stroke-linejoin=miter
    stroke="#0000000"
    stroke-width="3"/>

  <circle
    Cx="50" Cy="40" r="20"
    fill="#FFFF00"
    stroke="#F0F"/>
</SVG>
```

<11> 5 Points – Examine the picture to the right for the following questions.

1. The letters are each around 3 inches high. How many points tall is that?

$3\text{in} \times 72\text{pt/in} = 216 \text{ points}$

2. On the picture, indicate by circling all places where ***kerning can be strongly applied***.

FA, AT, LT



<12> 5 Points – On the following text samples, point out examples of ***serifs*** (the decorative marks on the flags and edges of characters), if present. If the typeface has no serifs write ***sans-serif*** next to it. Indicate which typeface(s) are ***monospaced*** or ***proportionally spaced***, and which in ***bold*** or in ***italics***, if any.

This is text.

sans-serif, proportional, italics

This is text.

serif, monospaced

This is text.

sans-serif, proportional

This is text.

serif, proportional

This is text.

serif, proportional, bold

<13> 5 Points – Short Answer – Answer only **one** of the following questions on the back of this page. (No extra credit for answering more than one.) Please, no more than 5 sentences.

1. How is **Normal.dotm** similar to and different from an external CSS file?

Both are external files that contain style information for the current document, but **Normal.dotm** is for Word documents and CSS files are for Web pages.

2. Why might I want to know where the **Normal.dotm** file is stored on disk?

1. Can delete it if it gets damaged, and Word will rebuild a minimal default.
2. Can make a back-up copy in case it does get damaged.
3. Can copy to a flash drive to copy styles to another machine.

3. Why is it important to be able to save a file in the **.PDF** format?

The **.PDF** document can be viewed and printed for free, without knowing what application created it.

4. Why is it important to be able to save a file in the **.RTF** format?

All word processors support the format, so it can be used to transfer documents between different word processors (Word, Wordpad, TextEdit, etc.)

5. Bézier and similar kinds of curves are often used to describe the outlines of text characters (i.e., typefaces). Why is that so very important to word processing and other programs?

The outlines of all the characters are described by mathematical curves so that they can be scaled to any arbitrary point size without changing their shapes.