

**UNCA CSCI 107**  
**Final Exam**  
29 April, 2016

This is a closed book and closed notes exam. It is to be turned in by around 5:00 PM. That will give you enough time for the practical. Communication with anyone other than the instructor is not allowed during the exam. Calculators may be used during this exam, but cell phones and any other electronic or communication devices may not.

Name: \_\_\_\_\_

**Problem 1 (9 points) Public Key Infrastructure (one more time)**

Suppose I wanted to send a message to everyone in the class saying that this exam was canceled. How could I do this with public/private keys in such a way that you verify that the message really was from me?

In your answer, talk about using public and private keys and not the `gpg` program.

**Problem 2 (8 points) Color in RGB**

In the RGB representation of color, the color **red** is represented by the triple (255,0,0). Give a reasonable triple for each of the following colors in RGB

- Green
- Yellow
- White
- Pink (light red)
- Navy (dark blue)

**Problem 3 (8 points) Photo editing**

What are “layers”? Give examples of how they are used in photo editing software?

**Problem 4 (8 points) SVG**



The image on the left is in SVG format.  
Is SVG a raster or vector image representation?

Under what circumstances is SVG preferred to JPEG and PNG?

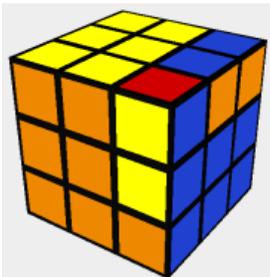
**Problem 5 (8 points) JPEG**



The image on the left is in JPEG format.  
Is JPEG a raster or vector image representation?

Under what circumstances is JPEG preferred to either GIF or PNG?

**Problem 6 (9 points) PNG**



The image on the left is in PNG format.  
Is PNG a raster or vector image representation?

Under what circumstances is PNG preferred to either SVG or JPG?

**Computer Science math**

**Problem 7 (4 points)**

How many values can be encoded using 6 bits?

**Problem 8 (4 points)**

If you want to encode 100 possible values, how many bits are needed?

**Problem 9 (12 points)**

How many pixels are required to encode an 600x800 image?

If each pixel is encoded in 24 bits, how many bits are required to store the image?

If the image is stored in a file, what is the size of the file in kilobytes?

**Problem 10 (5 points) 1024 or 1000?**

Why do computer geeks say that a kilobyte is 1024 bytes, when real scientists use kilo as an abbreviation for 1000?

**Getting ready for the last three questions**

Consider a document with a couple of paragraphs.

**The first paragraph is bold and green.**

**The second paragraph is bold and red.**

**Problem 11 (9 points)**

How can HTML and CSS be used to make the letters of all the paragraphs of a web page be displayed in a boldface font? Answer this question by writing some HTML and CSS. You will want to use the CSS property `font-weight`.

**Problem 12 (8 points)**

How can HTML and CSS be used to make the letters of **one** paragraph in your web page be displayed in green letters? Answer this question by writing little examples of CSS and HTML. You will want to use the CSS property `color`.

**Problem 13 (8 points)**

How can you make the **green** paragraph turn **blue** when the **red** paragraph is clicked? This time, don't write real HTML, CSS, or JavaScript. Just mention the features of HTML, CSS, and JavaScript that make this possible.