CS 5420	**Digital Image Processing**	Test 2
Name:	Fall 2016	Max Pts: 60

Important: This is an open book test. You can use any books, notes, or paper but no electronic device. *Do not log into the computer during the test, or use any electronic or communications device. Change your cell phones to silent mode*. Any calculations and rough work can be done on the back side of the test pages. If there is a syntax error in any program segment, just write it down and you will get full credit for the problem. Please write legibly; if I cannot read what you write, I'll give you a zero. You will lose five points for not writing your name.

1. [10 pt] What is an impulse train? What is its significance in signal processing?

2. [10 pt] Show that the Fourier transform of a unit impulse located at the origin is 1.

3. [10 pt] Consider an image that contains a test pattern of white bars on a black background. Each of the white bars is 7 pixels wide and 210 pixels high. The image size is 256×256 pixels. The bars are centered on the image such that they are separated from other bars by 17 pixels. There is at least 17 pixels from any white bar to its nearest border of the image. What will be the result of applying a 7×7 min filter to this image? Your answer should give me the height and width of each resulting white bar.

4. [10 pt] What is an optimum notch filter? Why is it better than a notch filter?

5. [10 pt] What is the difference between additive and subtractive color models? Why do we need the two models? Also, describe the difference between HSI and HSV color models.

6. [10 pt] We have observed that GIF is an indexed color format. It has a color table of 256 colors. Yet, in different images, the colors appear to be fairly close to true colors. How does GIF achieve that?