Differential Equations Test III Overview

As always your first best line of defense is to complete and understand the homework and lecture examples. I'll keep it simple this time. The test will be similar in content to my old test II's. You will get a sheet with the basic Laplace transforms and the basic theorems, there is a copy online in one of the old test II solutions, and I will give you a copy of this sheet in lecture. Finally you can expect I will give a problem or two as a takehome part of this exam, I will send out an email with more details when it is time.

1. Be able to derive trigonometric identities.
2. Know the explicit definition of the Laplace transform (it is an improper integral).
3. Know how to use the table of Laplace transforms.
4. Know how to use algebra and/or trig. identities to place expressions in a form which has a known Laplace transform.
5. Be able to convert a differential equation to an algebraic equation via the Laplace transform.
6. Be careful with notation, you will lose points for ignoring the difference between y and Y.
7. Know how to use the table of Laplace transforms to take inverse Laplace transforms.
8. Know how to use partial fractions to place expressions in a form which has a known inverse Laplace transform.
9. Be fluent in converting piecewise defined functions to those written with Heaviside (aka unit step) functions.
10. Know about the quirks of discontinuous functions, how to Laplace transform them etc...
11. What is a Dirac Delta function? Be able to find its Laplace transform from the definition of the Laplace transform (this is a very easy integration)
12. Be able to solve differential equations by the method of Laplace.
13. Know the major theorems (8,9,11,eqn 4, eqn 6, eqn 8) on the sheet for the test.
14. What is a convolution? Study how these give us a way to reduce our solution to an integral.
15. What is a periodic function? What is the "windowed" version of such a function?