Preparation sheet for Final Exam

Problems on this Test will be based on the homework problems listed below.

Note 1: The notation, e.g., 2.1.3, means 'Problem 3 of Sec. 2.1'.
Note 2: You should check the original homework assignment for hints, notes, or answers for any of the problems listed with an asterisk (e.g., 2.1.3*).
Note 3: A problem on the Test may combine concepts of more than one problem listed on this sheet, or it may use only part of the solution of a given homework problem.
Note 4: Problems within one HW assignment, but pertaining to different topics, are separated by a semi-colon and a larger space.
Note 5: Assignments are listed in reverse chronological order because the most recent assignments will have higher weight in the total score. Therefore, I recommend that you begin your preparation with the most recent items on the list below. (The only exception from this rule will be the exam problem based on HW # 2: even though it is an "early" HW, the corresponding problem's weight will still be sufficiently high.)

When preparing for the Test, it will be beneficial for your performance if you **redo** the problems listed below, and also review the related examples in the notes and in the book. Please **note**: It will **not be helpful** if you simply browse those problems **without actually doing them**.

If you can do a problem but are not confident that you can do it fast (as will be expected on the Test), you should redo it multiple times (taking breaks in between) until you *can* do it fast and with confidence. This is the same concept as that of doing multiple repetitions of a physical exercise to make your muscles master and remember it.

On this Test, use of a calculator will be allowed (although you will not really need one).
You may also prepare and use two double-sided sheets with formulas. There, you may write *anything* that you think may be useful to you on the Test: formulas, solutions of examples, pictures, etc.. However, make sure that those things are related to this Preparation sheet. That is, do *not* put there formulas "just in case": if they were not needed when you worked on this Preparation sheet, then they will not be needed on the Test.

1. **HW 27**: Do the entire assignment. (All but two of its problem will be directly related to problems on the exam.) Pay attention to the additional assignment for ## 15,17,18 (and, as always, to the Notes and Hints).

   • Do *not* include a table of Laplace transform pairs in your preparation sheet: I will give you such a table.

   • The partial fraction expansion that you will need to do will be as simple as that in the example done in class and in ## 42, 43; however, you still will *need to practice* doing that expansion in these simple cases.

- You **DO** need to know the Shift theorems and the formulas of Laplace transform of derivatives.

- While problems from HW 26 are not listed, I recommend that you still do them, as they provide a foundation for the problems in HW 27.

2. **HW 25**:   ## 4.8.{15*, 16*, 17*, 18*}.
   On the Test, you should *use* the appropriate formula, but should *not* derive it.

3. **HW 24**:   ## 4.6.{11*, 13*, 17*};   4.5.{1*, 3*, 5*}.

4. **HW 23**:   ## 3.11.{11*, 13*, 23*, 25*},   4.3.{25, 26}.

5. **HW 19**:   ## 3.10.{11(a*,c), 7*};   Word Problem.
   You must know not only the formula, but also how to plot the corresponding solution.

6. **HW 17**:   ## 3.8.{4*, 12*};   Word Problem 2.

7. **HW 15**:   ## 3.6.{7*, 9(a), 11}.

8. **HW 14**:   ## 3.5.{13*, 15*};   3.5.{2(a,b)*, 3(a,b), 9(a,b)}.

9. **HW 13**:   ## 3.4.{3*, 7*}.

10. **HW 12**:   ## 3.3.{3*, 7*}.

11. **HW 8**:   ## 2.8.{4*, 5, 6*, 7}.

12. **HW 7**:   ## 2.6.{35, 37, 36*}.

13. **HW 5**:   ## 2.6.3(a).

14. **HW 4**:   ## 2.3.{1, 7(a,c), 6(a,b)*}.

15. **HW 2**:   ## 2.2.{3, 20*;   4*, 7, 21;   36*, 37}.
    You must know, and be able to apply, the formulas for the solution of linear homogeneous and nonhomogeneous DEs.