

Last Name: \_\_\_\_\_ First Name: \_\_\_\_\_  
Student ID: \_\_\_\_\_

**EME172: Automatic Control of Engineering Systems**  
**Summer Session 1, 2007**  
Homework 1  
Due Monday, July 2, 2007  
(130 points)

1. Read Chapter 2 (2.1-2.8) in the textbook *Control Systems Engineering*.
2. (20 points) Solve the following ordinary differential equation by Laplace Transform

$$\frac{d^2 y}{dt^2} + 5 \frac{dy}{dt} + 4y = 3$$

Initial condition:  $y(0) = 1, \frac{dy}{dt}(0) = 0$

3. (20 points) Solve the following differential equation by Laplace Transform. Assume zero initial conditions.

$$\frac{d^2 x}{dt^2} + 8 \frac{dx}{dt} + 25x = 10 u(t)$$

4. (15 points) Problem 2-7.
5. (15 points) Problem 2-8.
6. (30 points) Problem 2-26.
7. (30 points) Problem 2-42.