Due: March 14, 2003   Name_____

wlg   **Print (last, first)**

Use engineering paper. Work only on one side of the paper. Use this sheet as your cover sheet, placed on top of your work and stapled in the top left-hand corner. Number the problems at the top of the page, in the center of the sheet. **Do neat work. Underline your answers. Show how you got your equations**. **Be sure to show how you got your answers.**   Problems 6.57, 6.61 6.64, 6.65, 6.68 count 15 points each. Problem 6.Extra 1 counts 30 points.

6.57   (a) $s^2 + 2s + 5 = 0$; (b) -1-j2, -1+j2 ;   (c) $v(t) = k_1 e^{-t}\cos2t + k_2 e^{-t}\sin2t$ V

6.61 $v(t) = 10e^{-4t}\cos 2t - 40e^{-4t}\sin2t$ V;   v(0) = 10,   v dot (0) = -120

6.Extra 1 The differential equation for 6.61 is given by;

$$\frac{d^2v(t)}{dt^2} + \frac{1}{RC}\frac{dv(t)}{dt} + \frac{1}{LC}v(t) = 0 \qquad \text{subject to the IC:} \ v(0) = 10 \text{ V},$$

$$\dot{v}(0) = -120 \text{ V}$$

   (a) Use standard MATLAB to plot the response, v(t). Label the axes and give a title.

   (b) Use Simulink and solve the differential equation. Give the A, B, and C matrices. Include your Simulink diagram. Plot v(t) with labels and title and compare the answer to that of part (a)

6.64 $v_0(t) = 16.67[e^{-2x10^5 t} - e^{-8x10^5 t}]$ V

6.65 $v_c(t) \ e^{-1.56t}[8\cos(4.75t + 2.63\sin(4.75t)]\ u(t)$ V $v_c(t) = 8\ u(-t)$ V

6.68 $v(t) = [8 + 2e^{-5t} - 10e^{-t}]\ u(t)$ V