**% Name (first and last)**

**% CSC 2262**

**% cs2262xx**

**% Sample 7**

**m1 = .8;**

**m2 = .6;**

**m3 = .5;**

**k1 = 4.3;**

**k2 = 5.1;**

**k3 = 4.6;**

**k4 = 5.4;**

**c1 = .024;**

**c2 = .012;**

**c3 = .020;**

**c4 = .016;**

**A11 = [ 0 0 0**

**0 0 0**

**0 0 0 ];**

**A12 = [ 1 0 0**

**0 1 0**

**0 0 1 ];**

**A21 = [ -(k1+k2)/m1 k2/m1 0**

**k2/m2 -(k2+k3)/m2 k3/m2**

**0 k3/m3 -(k3+k4)/m3 ];**

**A22 = [ -(c1+c2)/m1 c2/m1 0**

**c2/m2 -(c2+c3)/m2 c3/m2**

**0 c3/m3 -(c3+c4)/m3 ];**

**A = [A11 A12**

**A21 A22];**

**[eigvec eigval] = eig(A);**

**t = 0:.001:12;**

**line1x = [0 12];**

**line1y = [0 0];**

**titles(1,:) = 'Sample 7, Figure 1';**

**titles(2,:) = 'Sample 7, Figure 2';**

**titles(3,:) = 'Sample 7, Figure 3';**

**n = 0;**

**for(k = 5 : -2 : 1)**

**n = n + 1;**

**alpha = real( eigval(k,k) );**

**beta = imag( eigval(k,k) );**

**omega = sqrt( alpha^2 + beta^2 );**

**zeta = -alpha/omega;**

**w = omega \* sqrt( 1 - zeta^2 );**

**a1 = real( eigvec(1,k) );**

**b1 = imag( eigvec(1,k) );**

**a2 = real( eigvec(2,k) );**

**b2 = imag( eigvec(2,k) );**

**a3 = real( eigvec(3,k) );**

**b3 = imag( eigvec(3,k) );**

**x1 = 2 \* exp(alpha\*t) .\* ( a1\*cos(w\*t) + b1\*sin(w\*t) );**

**x2 = 2 \* exp(alpha\*t) .\* ( a2\*cos(w\*t) + b2\*sin(w\*t) );**

**x3 = 2 \* exp(alpha\*t) .\* ( a3\*cos(w\*t) + b3\*sin(w\*t) );**

**figure(n);**

**plot(t,x1,'b',t,x2,'r',t,x3,'g',line1x,line1y,'k');**

**axis([0 12 -.6 .6]);**

**set(gca,'xtick',0:2:12);**

**set(gca,'ytick',-.6:.2:.6);**

**xlabel('t');**

**ylabel('x1(blue), x2(red), x3(green)');**

**title(titles(n,:));**

**end**