

-----<(M File)>-----

% For constant torque 5Nm

clc

clear

TR = [0 5]; % time RANGE

X0 = [0;0;0;0];%initial conditions

[t,z] = ode45(@func1, TR, X0);%calling the solver to solve by function

%storing given array as vectors

theta1 = z(:, 1);

AngVel1 = z(:, 2);

theta2 = z(:, 3);

AngVel2 = z(:, 4);

%plotting the angular displacements and velocities

acc1 = diff(AngVel1);

acc2 = diff(AngVel2);

plot(t,theta1,t,AngVel1,t,[0;acc1],t,theta2,t,AngVel2,t,[0;acc2]);

xlabel('time')

legend('Angular Displacement 1','Angular Velocity 1','Angular acceleration 1','Angular Displacement 2','Angular Velocity 2','Angular acceleration 2')

ylabel('position & Velocity')

title("m-file")

%function containing the differentialequations

function dx = func1(~, x)

% Values of Coefficients

J1=1; J2=10; D1=0.9; D2=0.02; k=3;T=5;

% State Equations

dx(1) = x(2);

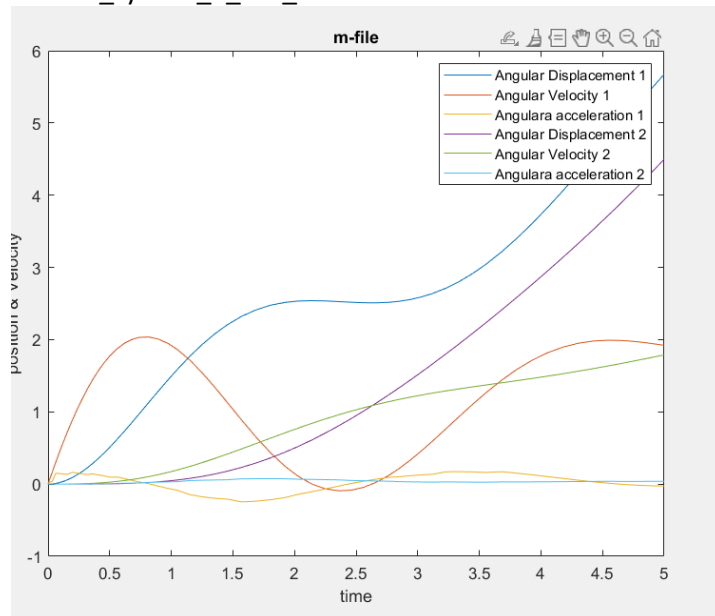
dx(3) = x(4);

dx(2) = (T-D1*x(2)-k*x(1)+k*x(3))/J1;

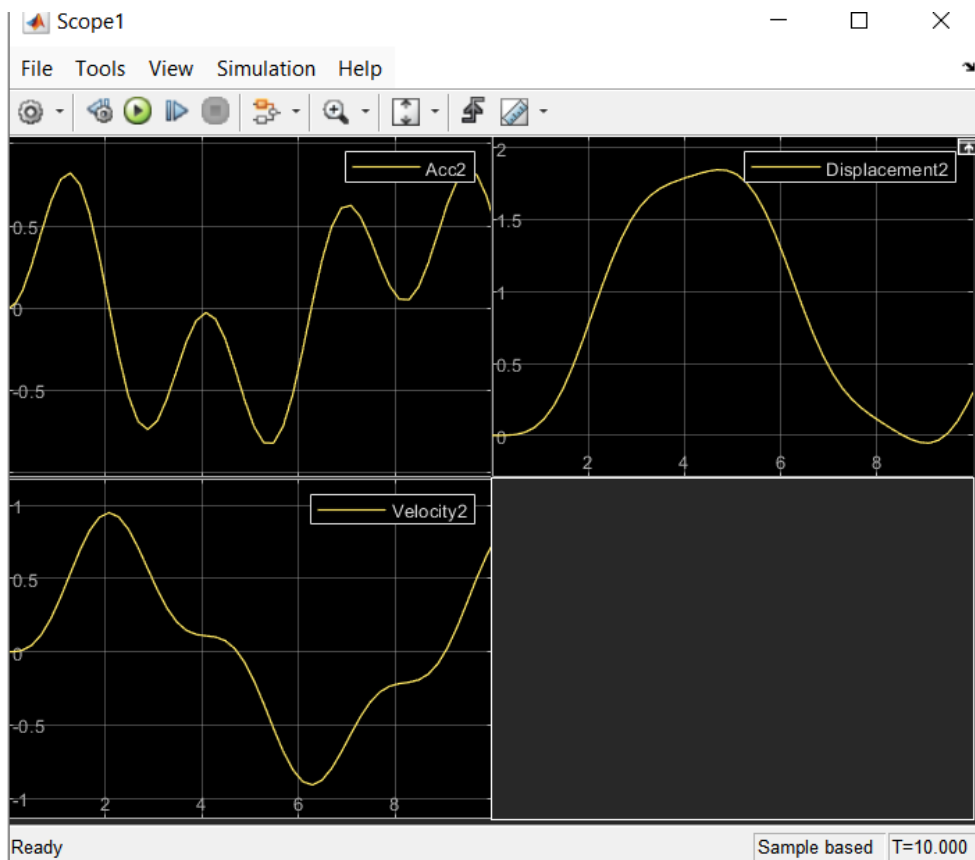
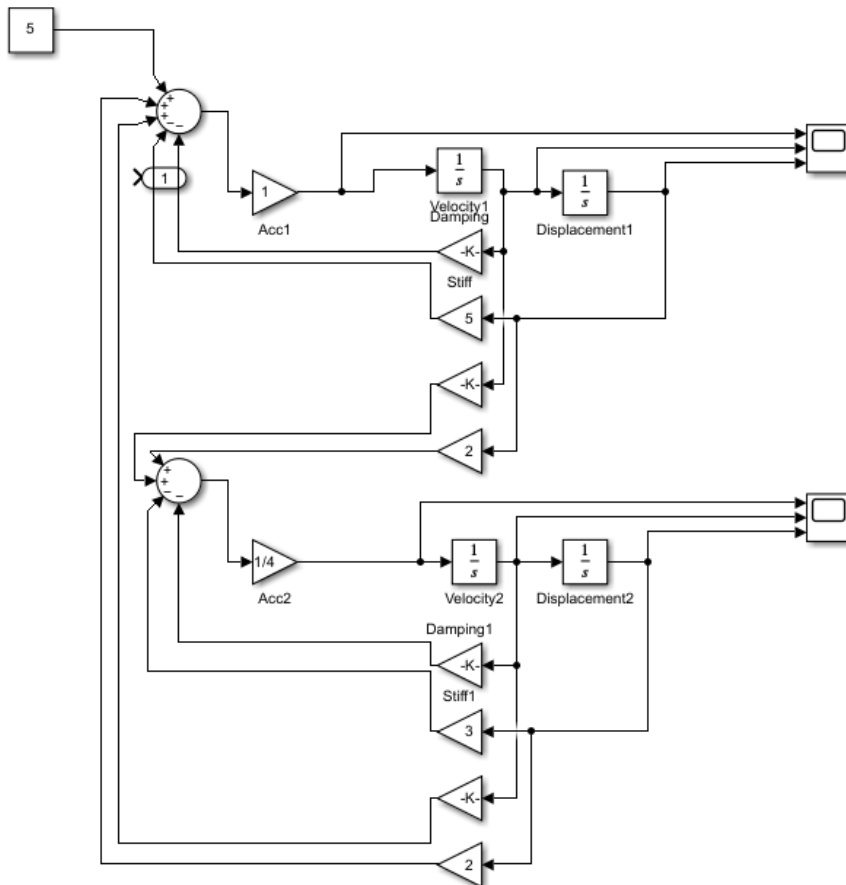
dx(4) = (-k*x(3)-D2*x(4)+k*x(1))/J2;

dx = dx';

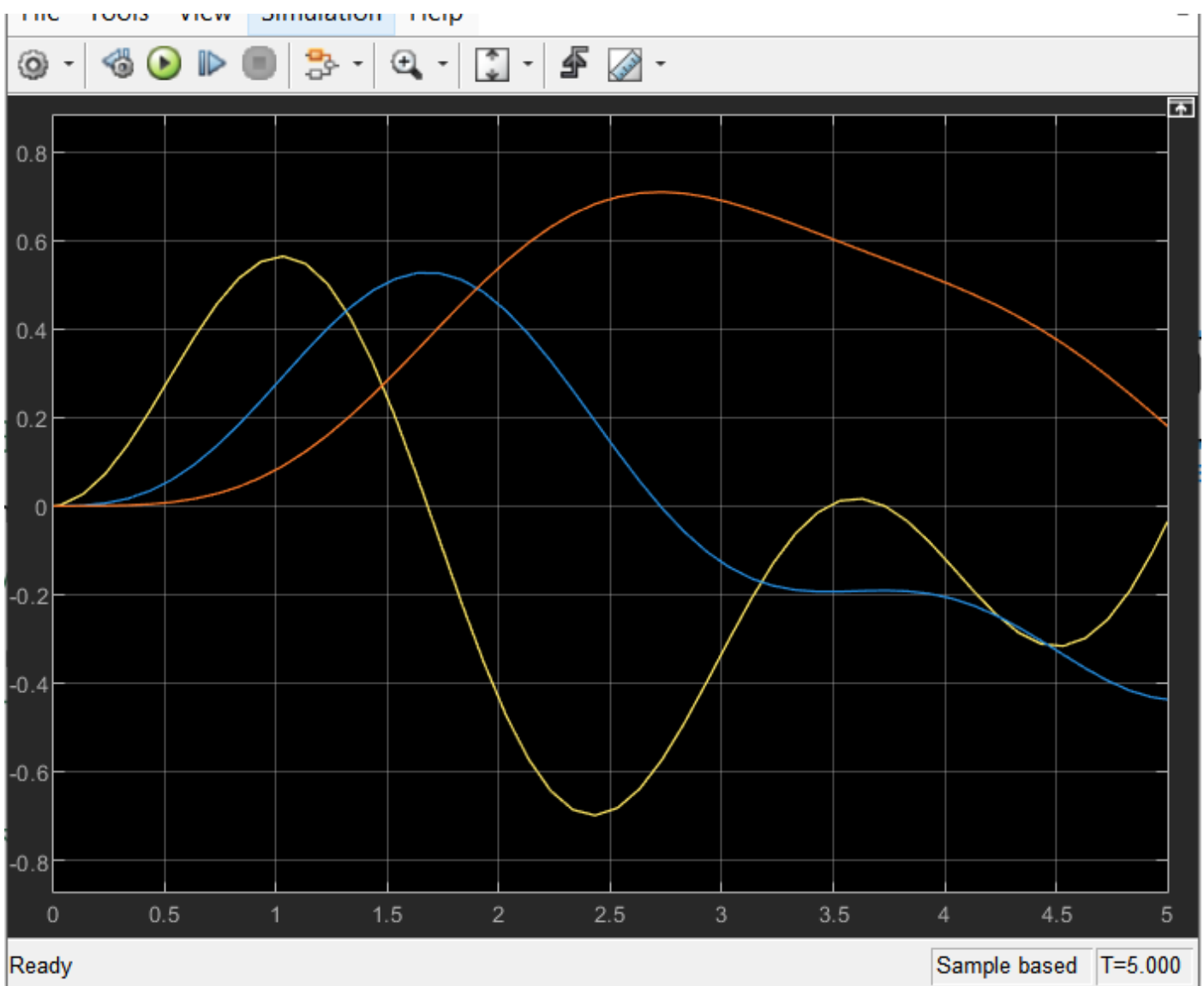
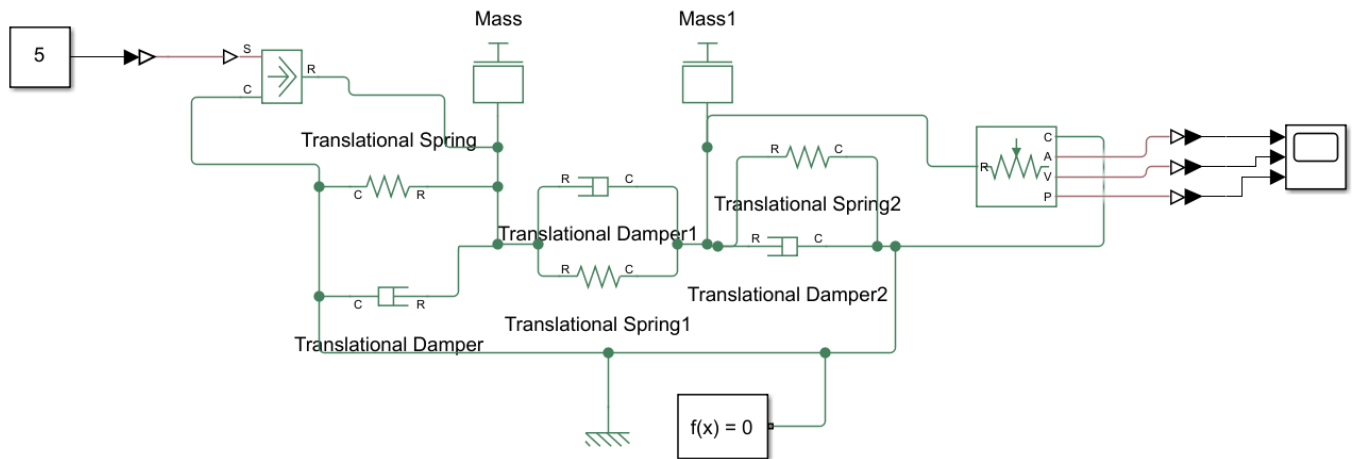
end



<(Simulink)>



<(SIMSCAPE)>



Linearization result details for linsys1:

Select linearization result:

Display linearization result as:

Transfer Function

Linearization Result:

From input "u1" to output "y1":
 $0.0025 s + 0.5$

 $s^4 + 0.0475 s^3 + 5 s^2 + 0.0325 s$

Name: Linearization at model initial condition
Continuous-time transfer function.
Model Properties