```
clc;
TR=0:0.01:10;
x0=[0;0;0;0];
[t,x]=ode45(@Task3Fun,TR,x0);
th1=x(:,1);
om1=x(:,2);
alpha1=gradient(om1)./gradient(t);
th2=x(:,3);
om2=x(:,4);
alpha2=gradient(om2)./gradient(t);

subplot(2,3,1);
plot(t,th1);xlabel('time');ylabel('theta 1');
subplot(2,3,2);
plot(t,om1);xlabel('time');ylabel('omega 1');
subplot(2,3,3);
plot(t,alpha1);xlabel('time');ylabel('alpha 1')
subplot(2,3,4);
plot(t,th2);xlabel('time');ylabel('theta 2');
subplot(2,3,5);
plot(t,om2);xlabel('time');ylabel('omega 2');
subplot(2,3,6);
plot(t,alpha2);xlabel('time');ylabel('alpha 2')
%%%%%%%%%%%%%%%%%%%
function dy=Task3Fun(t,y)
   T=1;
   dy(1)=y(2);
   dy(2)=1/5*(y(4) + 9*y(3) - 9*y(2) - 9*y(1));
   dy(3)=y(4);
   dy(4)=1/3*(T+y(2) + 9*y(1) - y(4) - 12*y(3));
   dy=dy';
end
```

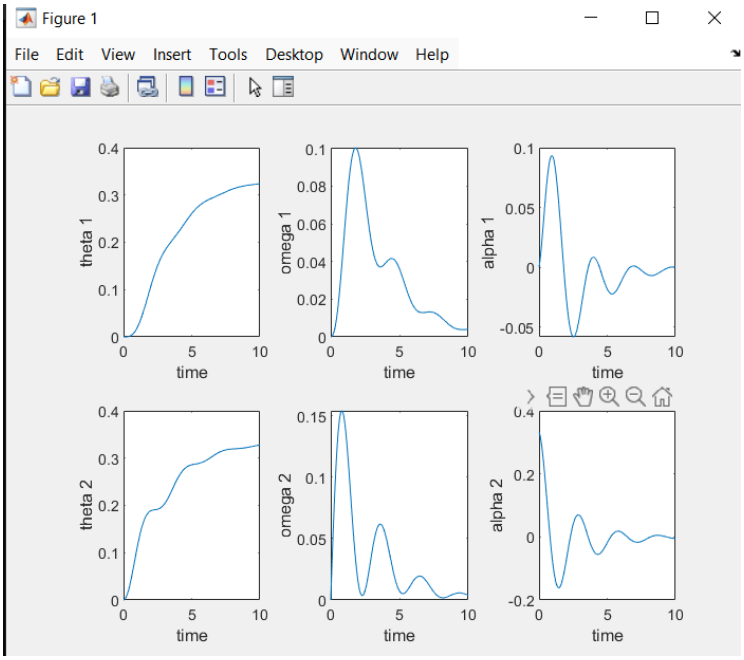
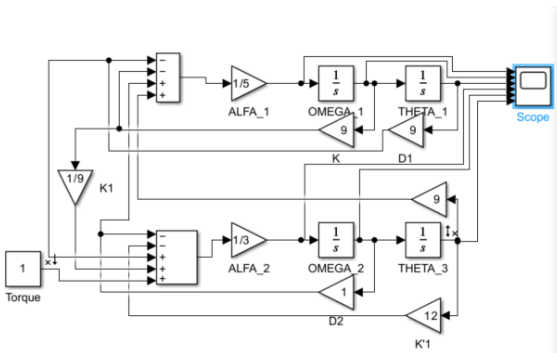
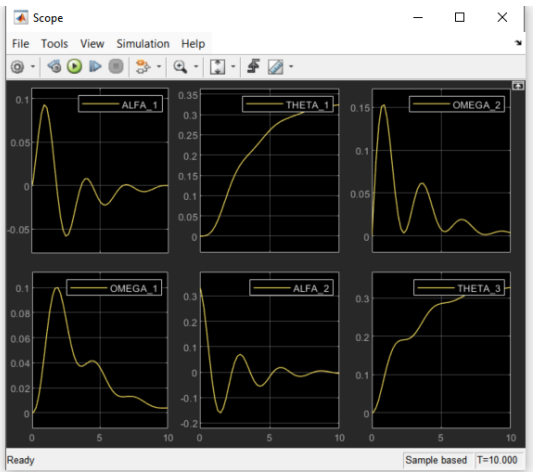


Figure 1
File Edit View Insert Tools Desktop Window Help
theta 1
omega 1
alpha 1
theta 2
omega 2
alpha 2
time

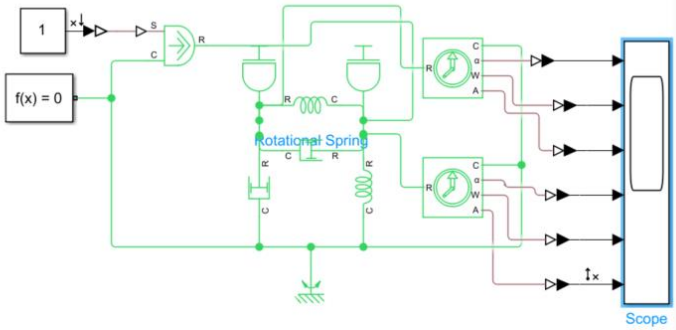


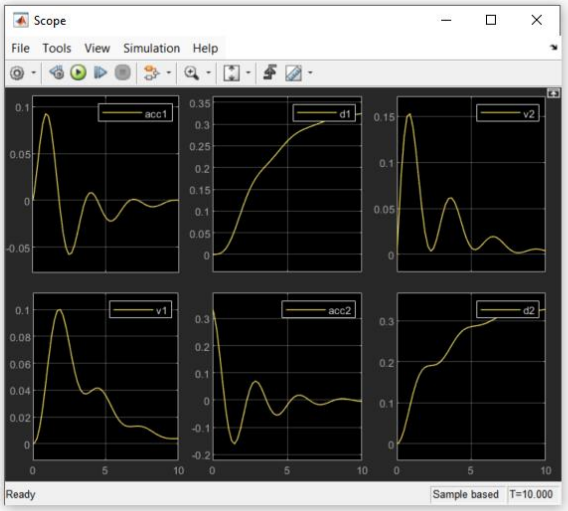



```
From input "Torque" to output "THETA_3":
          0.3333 s^2 + 0.6 s + 0.6
-----------------------------------------
s^4 + 2.133 s^3 + 2.333 s^2 - 9.171e-17 s
```

A =

	x1	x2	x3	x4
x1	-1.8	0.2	-1.8	0
x2	0.3333	-0.3333	3	0
x3	1	0	0	0
x4	0	1	0	0



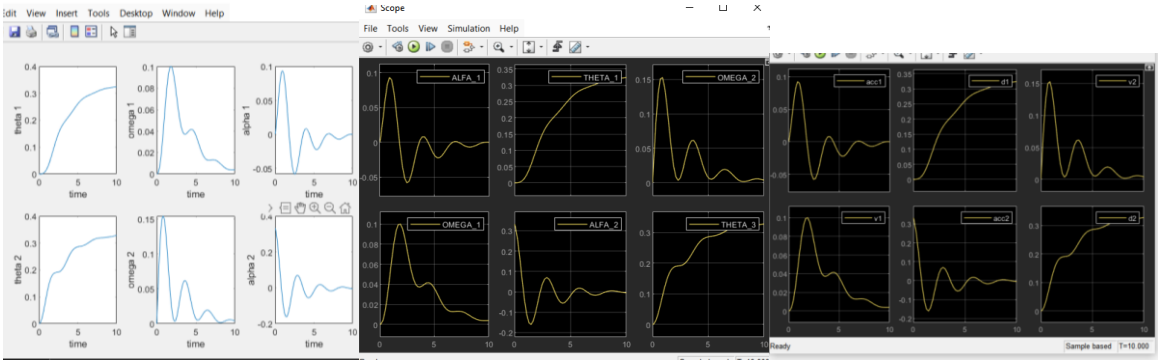


From input "u1" to output "y1":

$$\frac{0.3333\ s^2 + 0.6\ s + 0.6}{s^4 + 2.133\ s^3 + 6.333\ s^2 + 6.6\ s + 1.8}$$

A =

	x1	x2	x3	x4
x1	-1.8	0	0.2	-1.8
x2	1	0	0	0
x3	0.3333	-1	-0.3333	4
x4	1	0	-1	0


Edit View Insert Tools Desktop Window Help
theta 1
omega 1
alpha 1
theta 2
omega 2
alpha 2
time
Scope
File Tools View Simulation Help
ALFA_1
THETA_1
OMEGA_2
OMEGA_1
ALFA_2
THETA_3
acc1
d1
v2
v1
acc2
d2
Ready
Sample based T=10.000