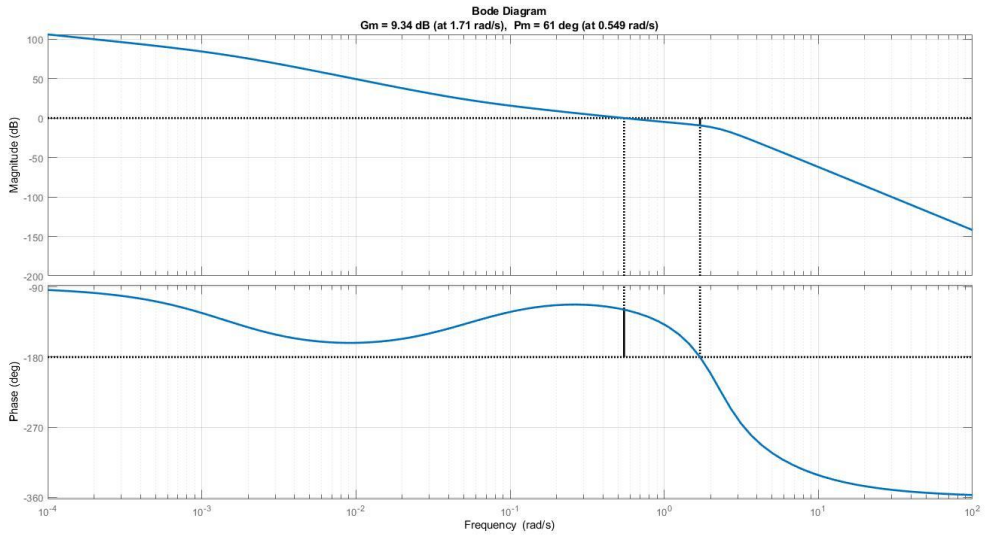
(Q1



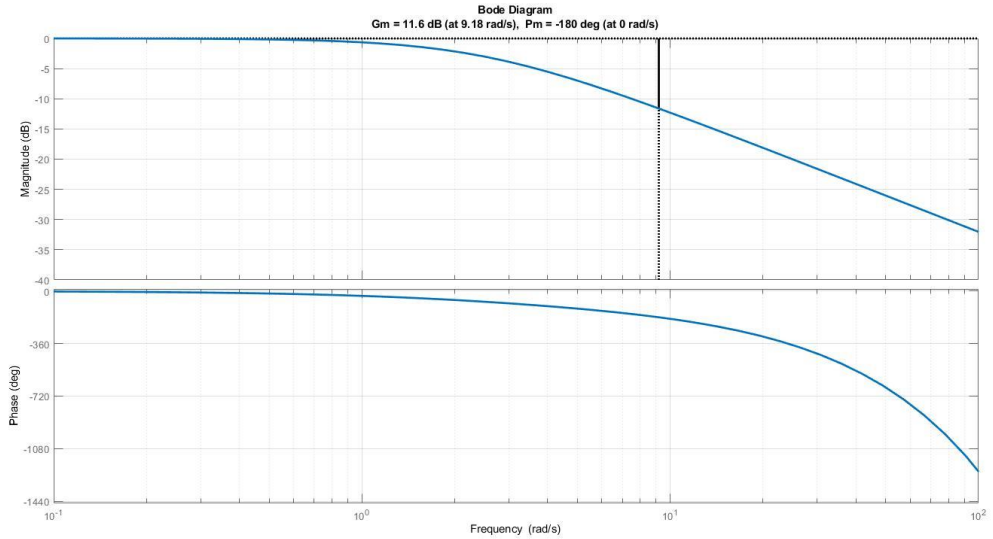
کد متلب سوال 1 :

```
clc;
clear all;
close all;

s=tf('s');
num =300*(18.32*s+1);
%num1 =5*(s+1);
den=(683.89*s+1)*(s)*(s+3)*(s^2+2*s+5);
sys=num/den;
%sys1=num1/den;
```

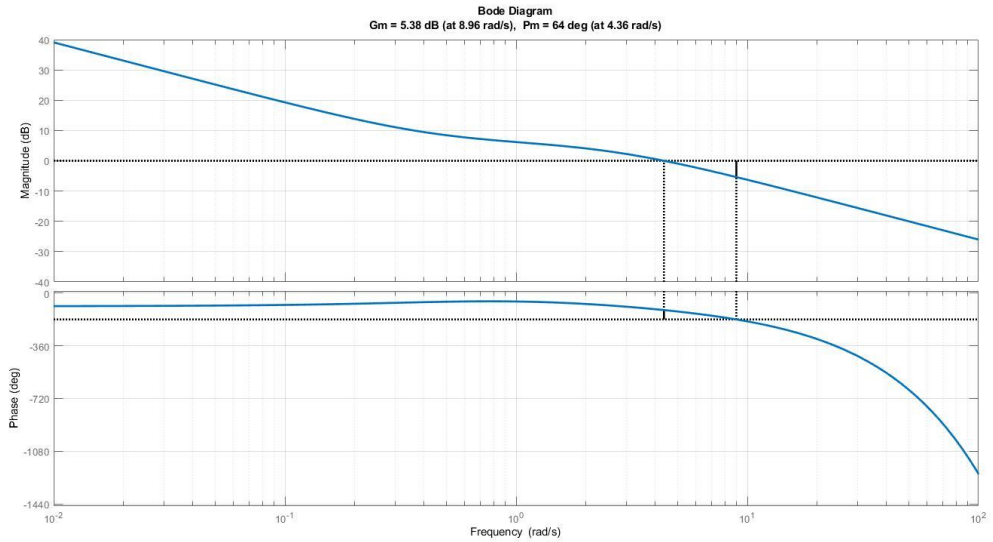
```
display(sys);
%display(sys1);

figure
bode(sys);
set(findall(figure(1),'type','line','linewidth',2))
title('bode with exponentioal');
margin(sys), grid
set(findall(figure(1),'type','line'),'linewidth',2)
grid on
```

(Q3

- پاسخ سیستم اصلی :



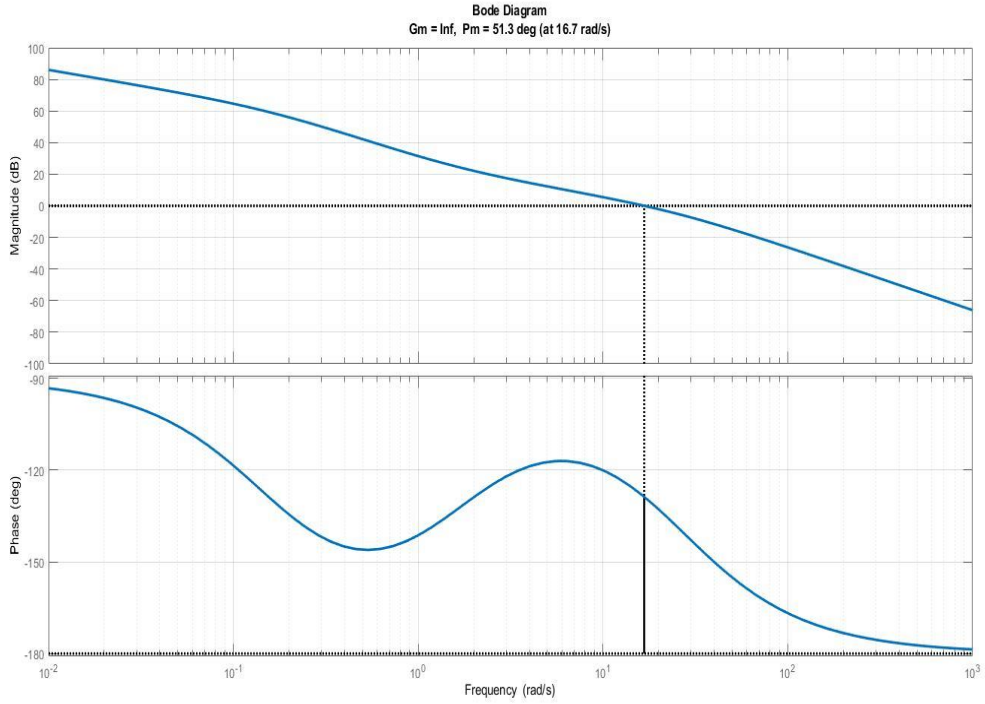
- پاسخ سیستم کنترل شده :



کد متلب سوال 3 :

```
clc;
clear all;
close all;

s=tf('s');
Cs=(2+0.9/s);
num =exp(-0.2*s);
num1 =Cs*num;
den=0.4*s+1;
sys=num/den;
sys1=num1/den;
%display(sys);
display(sys1);
figure
bode(sys1);
set(findall(figure(1),'type','line','linewidth',2))
title('bode with exponentioal');
margin(sys1), grid
set(findall(figure(1),'type','line'),'linewidth',2)
```

(Q4



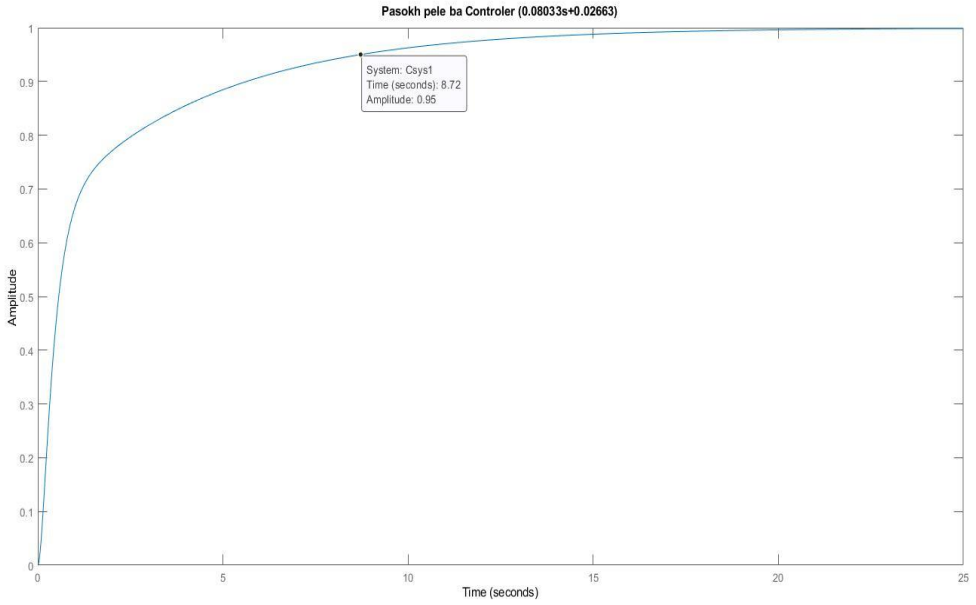
کد متلب سوال 4 :

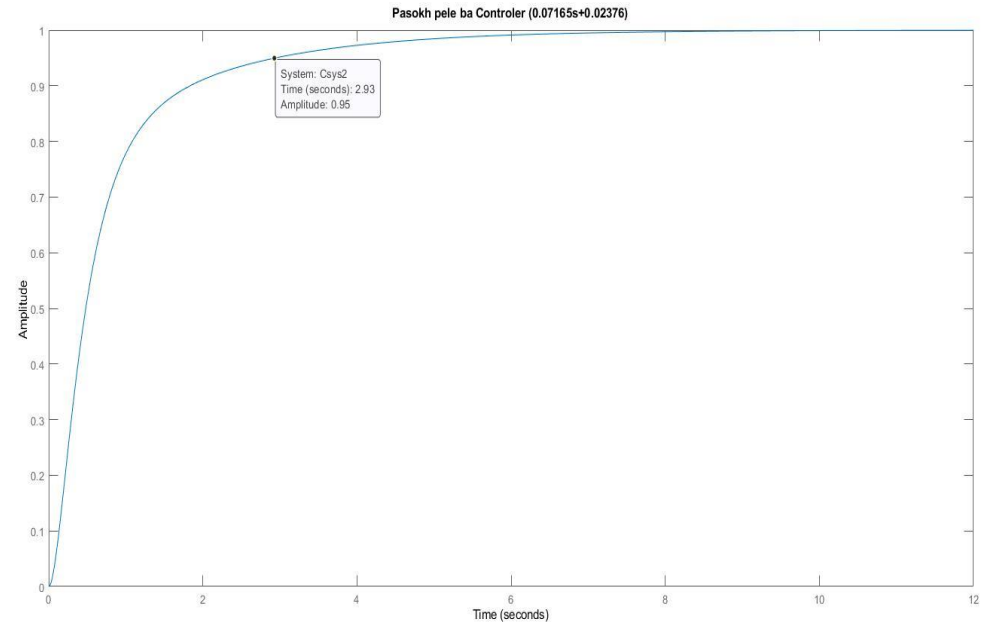
```
clc;
clear all;
close all;


s=tf('s');
num =5000*(0.62*s+1);
%num1 =5*(s+1);
den=s*(s+25)*(6.2*s+1);
sys=num/den;
%sys1=num1/den;
```

```
display(sys);
%display(sys1);

figure
bode(sys);
set(findall(figure(1),'type','line','linewidth',2))
title('bode with exponentioal');
margin(sys), grid
set(findall(figure(1),'type','line'),'linewidth',2)
grid on
```

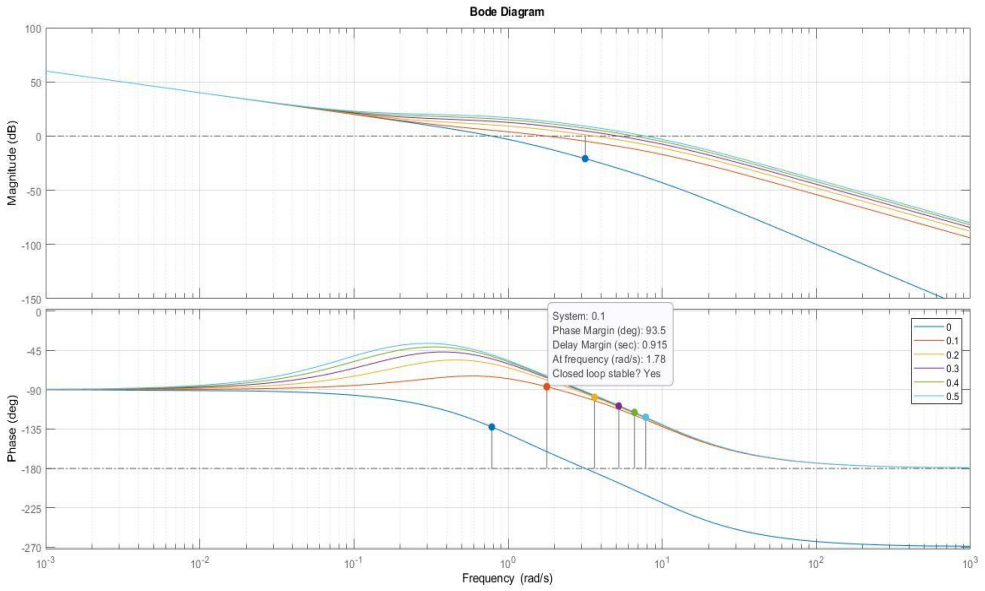
(Q5

الف) پاسخ پله :





ب)



کد متلب سوال 5 :

الف)

```
clc;
clear all;
close all;

s=tf('s');
Cs1=0.08033*s+0.02663;
Cs2=0.085922*s+0.0601;
num=Cs1*200;
num1=Cs2*200;
```

```
%num1 =5*(s+1);
den=s*(s+1)*(s+10);
sys=num/den;
sys1=num1/den;
%sys1=num1/den;
disp('Open loop with Controller (0.08033s + 0.02663):
');
sys
disp('Open loop with Controller (0.07165s + 0.02376):
');
sys1
%display(sys1);
Csys1=sys/(1+sys);
Csys2=sys1/(1+sys1);
disp('Closed loop with Controller (0.08033s + 0.02663):
');
Csys1
disp('Closed loop with Controller (0.07165s + 0.02376):
');
Csys2
```

```
figure
step(Csys1);
title('Pasokh pele ba Controler (0.08033s+0.02663)');

figure
step(Csys2)
title('Pasokh pele ba Controler (0.07165s+0.02376)');
```

ب)

```
clc;
clear all;
close all;

% define Controller
s=tf('s');
Cs1=0.05;
Cs2=0.05+0.1*s;
Cs3=0.05+0.2*s;
Cs4=0.05+0.3*s;
Cs5=0.05+0.4*s;
```

```
Cs6=0.05+0.5*s;

% define SYS
num1=Cs1*200;
num2=Cs2*200;
num3=Cs3*200;
num4=Cs4*200;
num5=Cs5*200;
num6=Cs6*200;
%num1 =5*(s+1);
den=s*(s+1)*(s+10);
sys1=num1/den;
sys2=num2/den;
sys3=num3/den;
sys4=num4/den;
sys5=num5/den;
sys6=num6/den;
%sys1=num1/den;
```

```
figure
hold on
bode(sys1);
bode(sys2);
bode(sys3);
bode(sys4);
bode(sys5);
bode(sys6);

legend('0','0.1','0.2','0.3','0.4','0.5');
grid on
```