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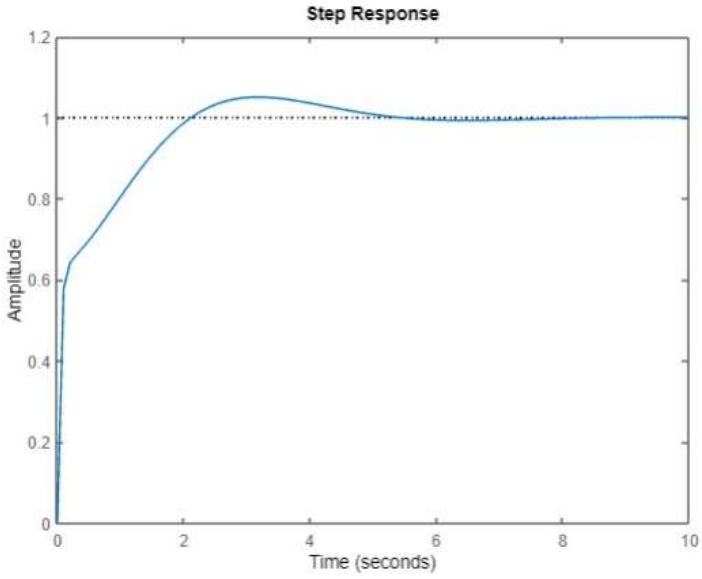
20BCD7138

Aim : PID controlling for open & closed loop system

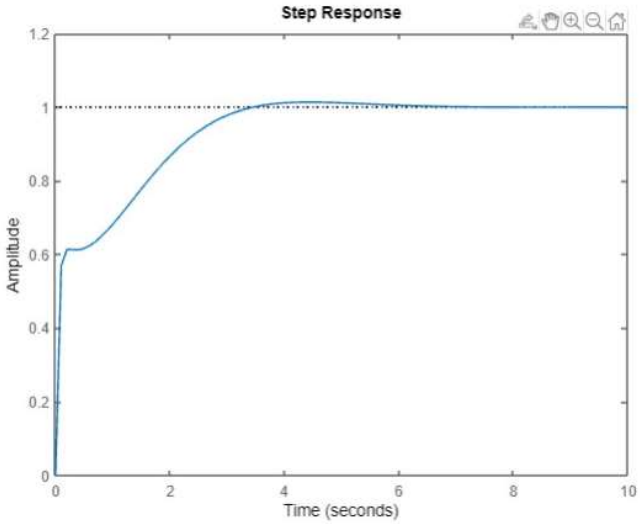
Open-loop transfer function –

```
%% KHAN MOHD OWAIS RAZA [20BCD7138]
%% ECE1008 LAB
clc
close all
clear all
num = [1];
den = [1 10 10];
trfOL = tf(num,den);
time = 0:0.1:10;
trfCL = feedback(trfOL,1);
stepinfo(trfCL)
Kp = 20;
Ki = 30;
Kd = 15;
c = pid(Kp,Ki,Kd);
trfWC = feedback(c*trfOl,1);
step(trfWC,time)
```

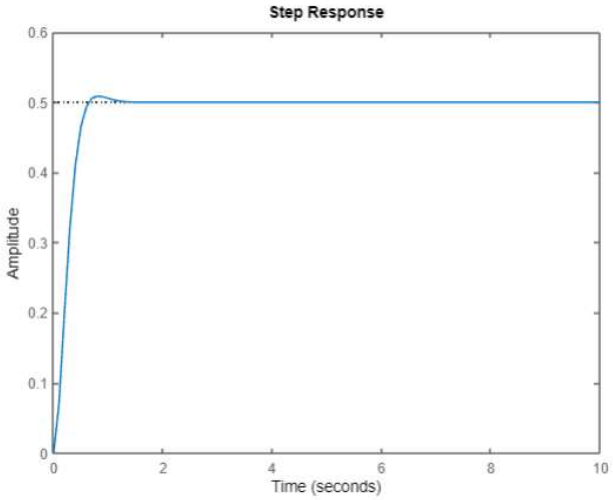


Closed-loop transfer function -

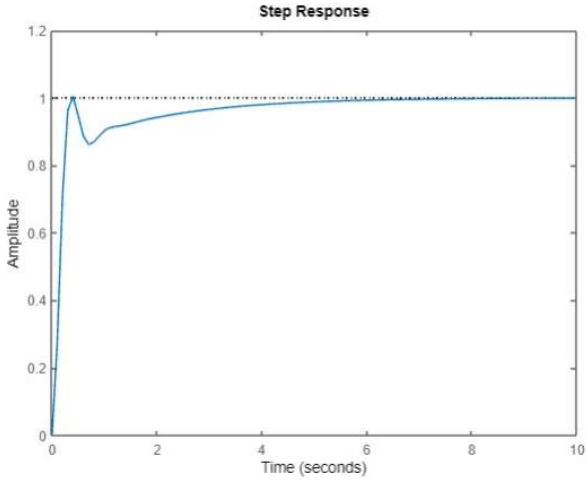
```
%% KHAN MOHD OWAIS RAZA [20BCD7138]
%% ECE1008 LAB
clc
close all
clear all
num = [1];
den = [1 10 20];
trfOL = tf(num,den);
time = 0:0.1:10;
trfCL = feedback(trfOL,1);
stepinfo(trfCL)
Kp = 20;
Ki = 30;
Kd = 15;
c = pid(Kp,Ki,Kd);
trfWC = feedback(c*trfOl,1);
step(trfWC,time)
```



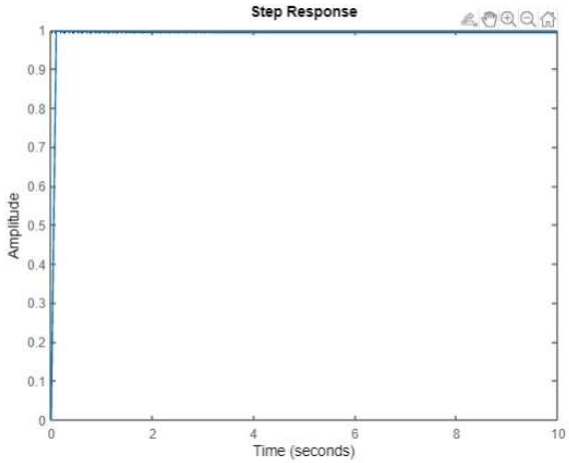
P controller –



PI controller –



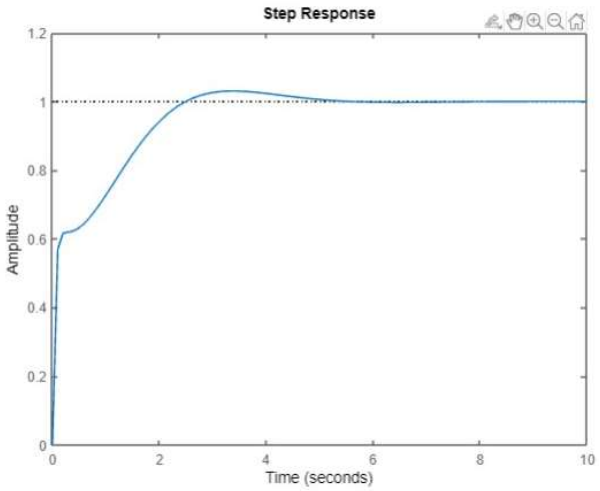
PD controller –



PID controller –

```
%% KHAN MOHD OWAIS RAZA [20BCD7138]
%% ECE1008 LAB
clc
close all
clear all
num = [1];
den = [1 10 20];
trfOL = tf(num,den);
time = 0:0.1:10;
trfCL = feedback(trfOL,1);
stepinfo(trfCL)
Kp = 20;
Ki = 40;
```

```
Kd = 15;
c = pid(Kp,Ki,Kd);
trfWC = feedback(c*trfOl,1);
step(trfWC,time)
```



Observations –

Increase in Kp causes overshoot and reduces the steady state error.

Increase in Ki increase in overshoot and reduce the rise time.

Increase in Kd reduces overshoot and reduces setting time.