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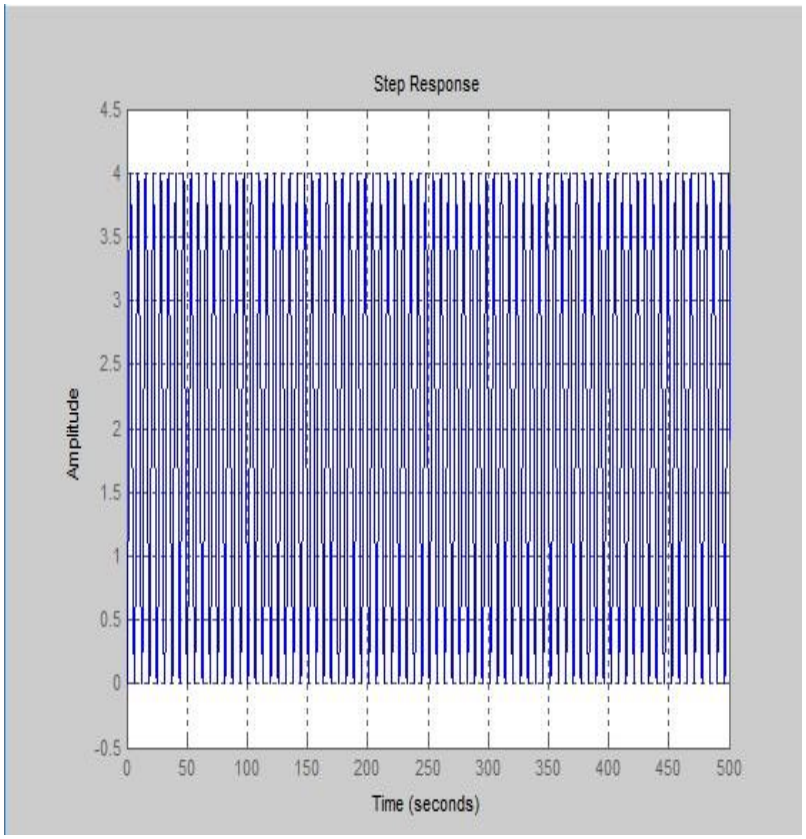
Id: 120170672

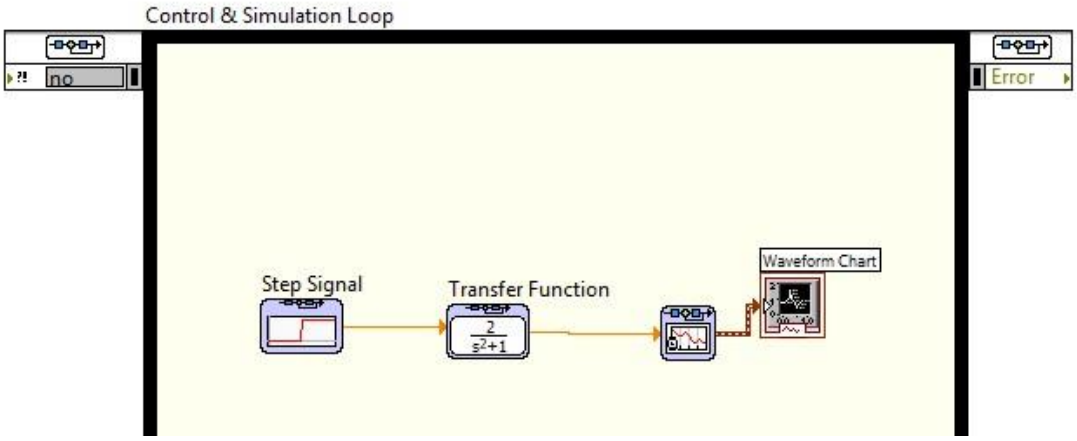
Eng: Nael Dokhan

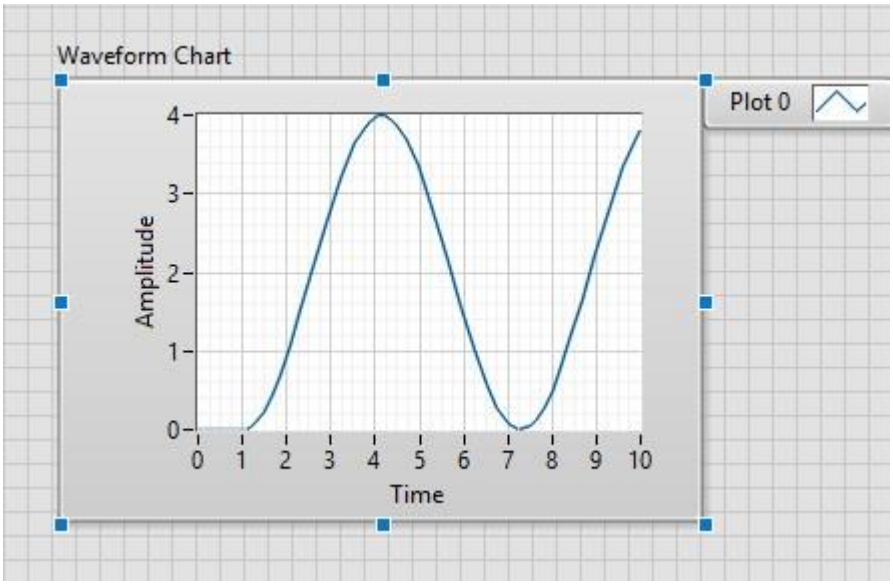
Lab 5

Q1)

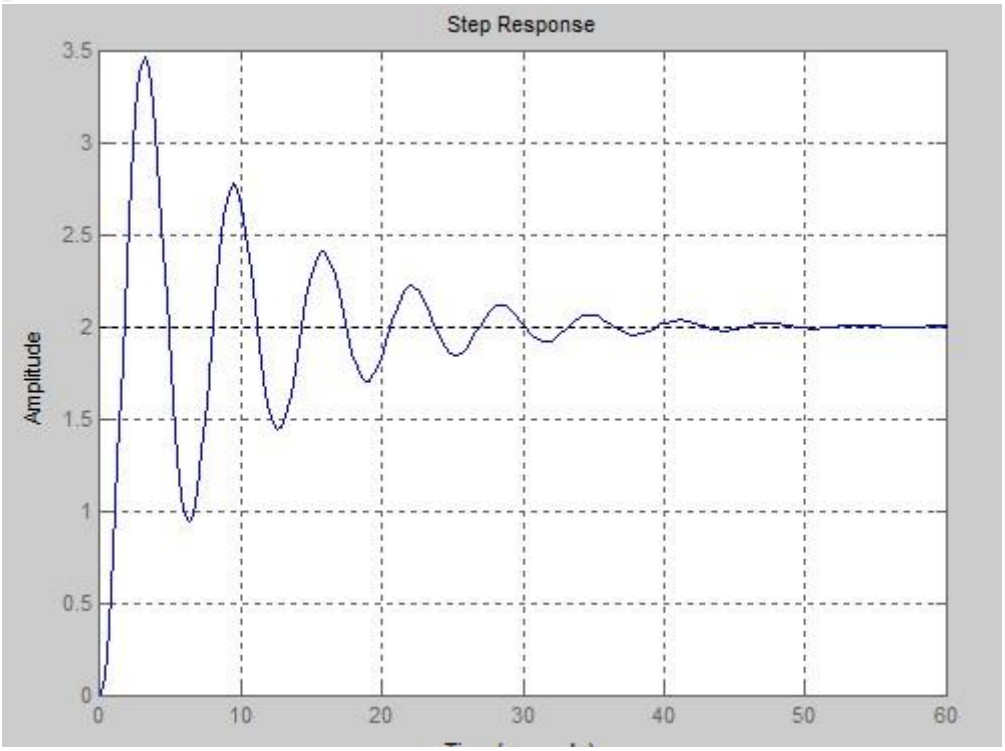
```
>> num =[2];
den =[1 0 1];
sys =tf(num,den)
step(sys)
grid

sys =

      2
  -------
  s^2 + 1

Continuous-time transfer function.

>>
```

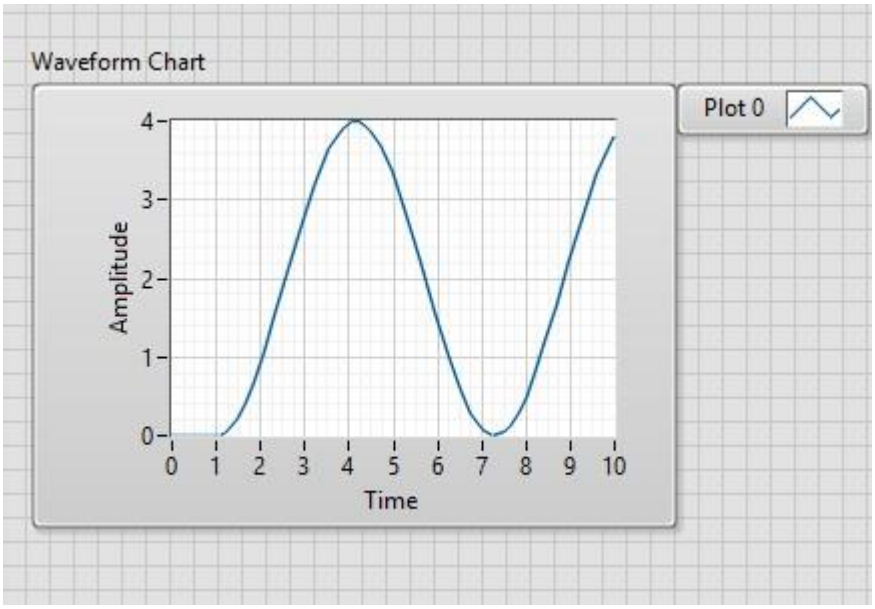


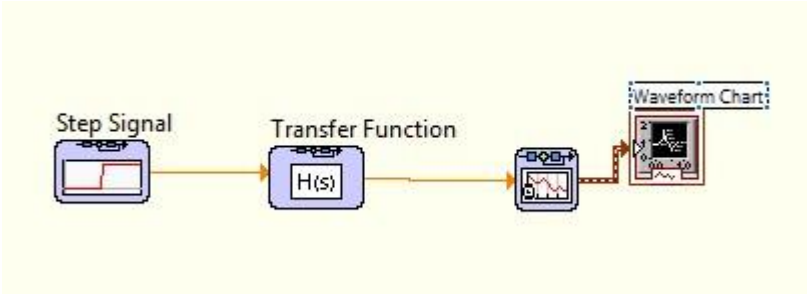

Control & Simulation Loop
no
Error
Step Signal
Transfer Function
2
s²+1
Waveform Chart


Waveform Chart
Plot 0
Amplitude
Time
0
1
2
3
4
0
1
2
3
4
5
6
7
8
9
10

```
>> num =[2];
den =[1 (2*0.1) 1];
sys =tf(num,den)
step(sys)
grid

sys =

          2
  --------------
  s^2 + 0.2 s + 1

Continuous-time transfer function.
```

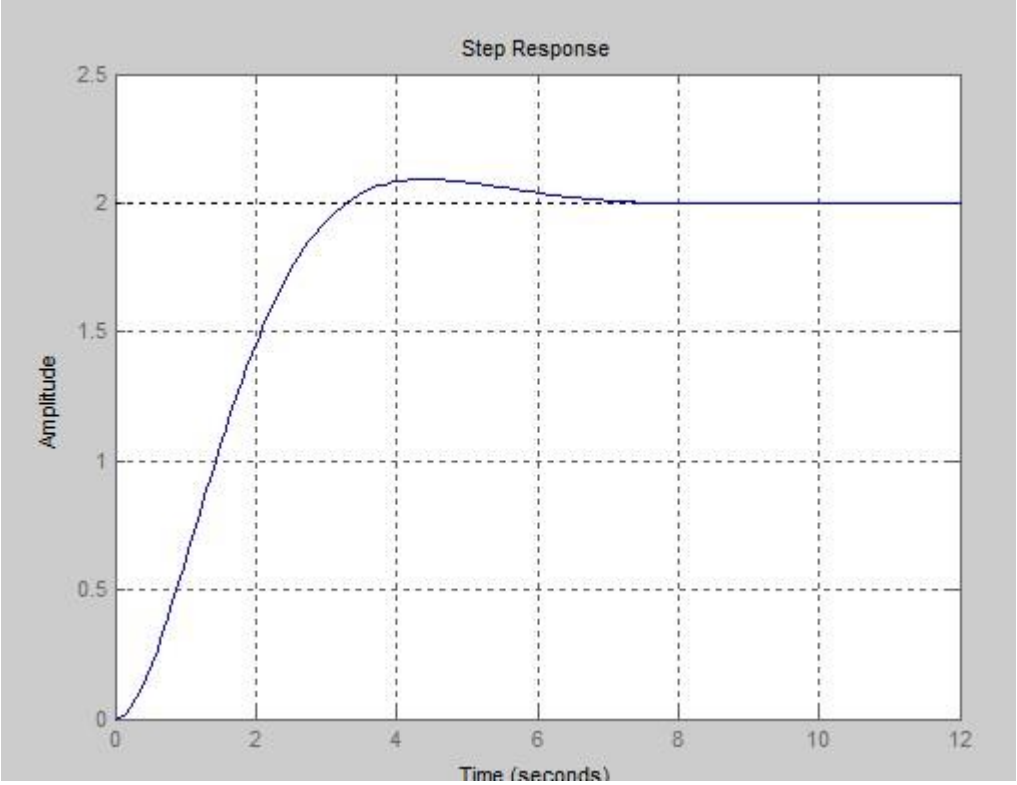


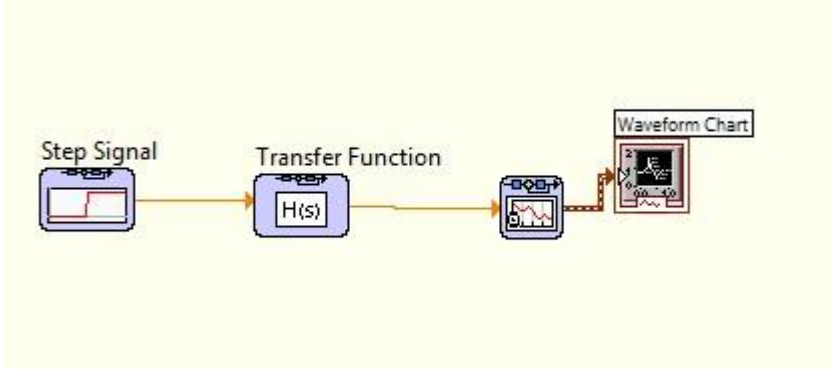

Waveform Chart
Plot 0
Amplitude
Time
0
1
2
3
4
0
1
2
3
4
5
6
7
8
9
10

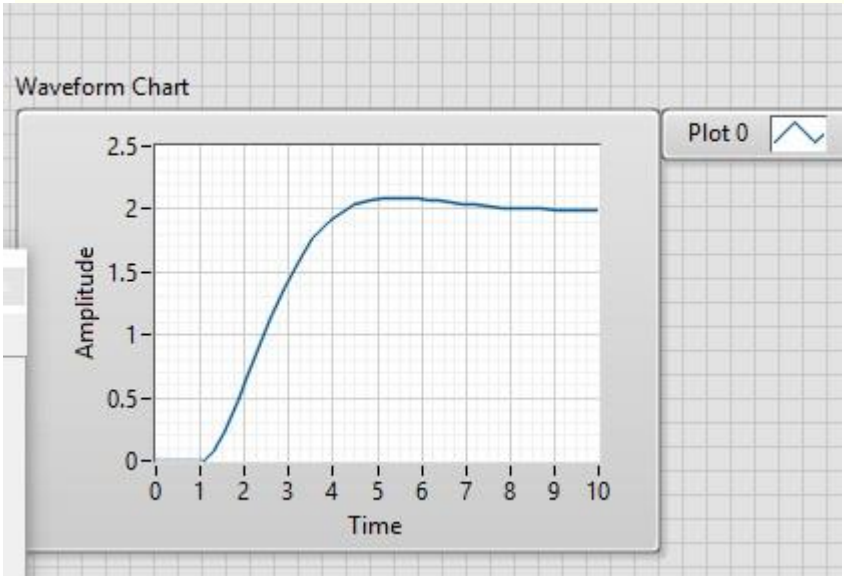

Step Signal
Transfer Function
H(s)
Waveform Chart

(3

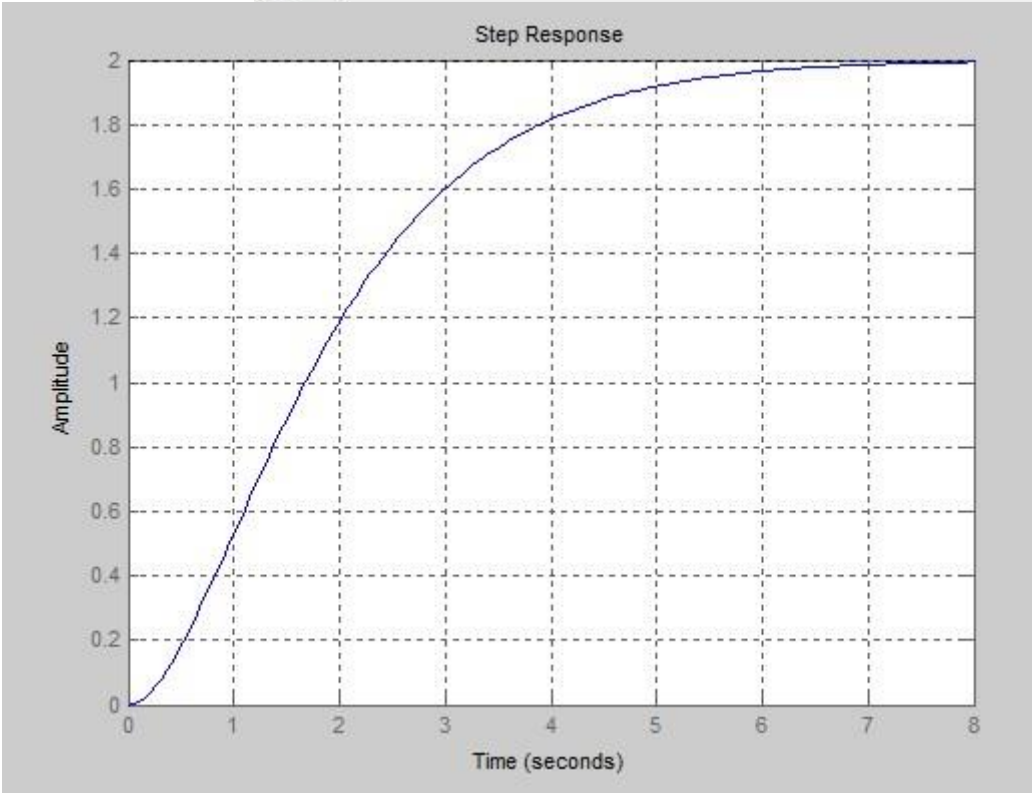
```
>> num =[2];
den =[1 (2*0.7) 1];
sys =tf(num,den)
step(sys)
grid

sys =

          2
  --------------
  s^2 + 1.4 s + 1

Continuous-time transfer function.
```

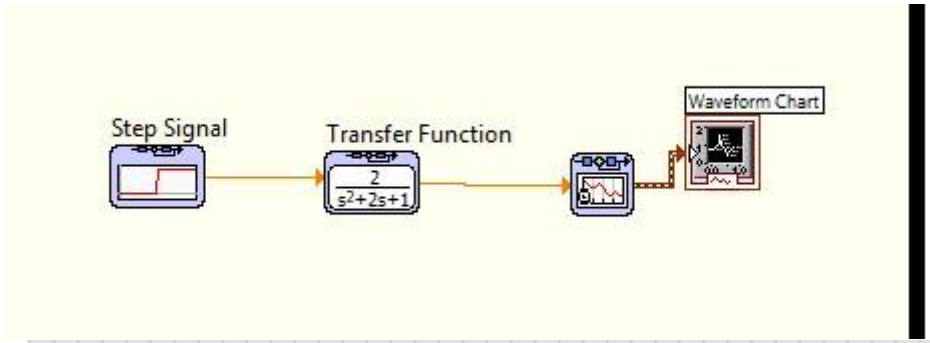


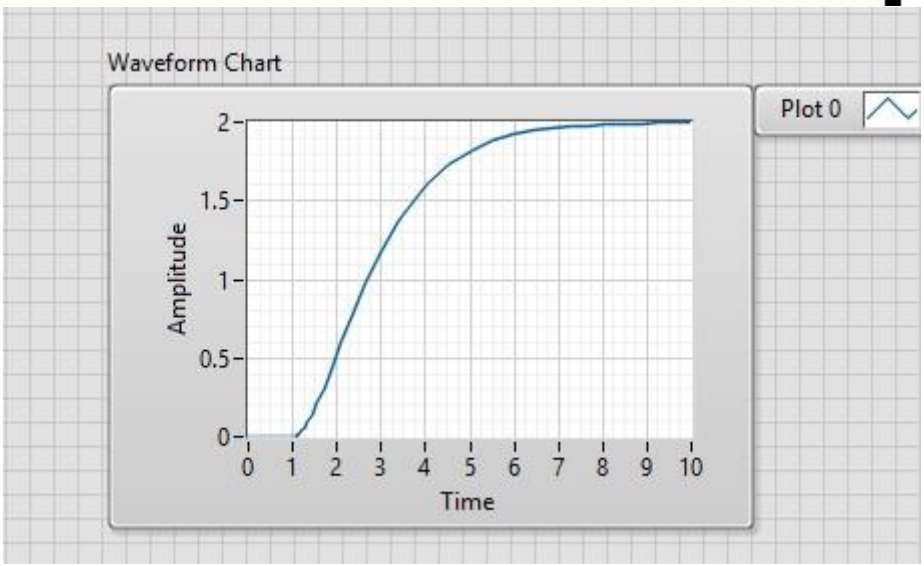

Step Signal
Transfer Function
H(s)
Waveform Chart


Waveform Chart
Plot 0
Amplitude
2.5
2
1.5
1
0.5
0
0 1 2 3 4 5 6 7 8 9 10
Time

```
den =[1 (2*1) 1];
sys =tf(num,den)
step(sys)
grid

sys =

        2
  -------------
  s^2 + 2 s + 1

Continuous-time transfer function.

>>
```

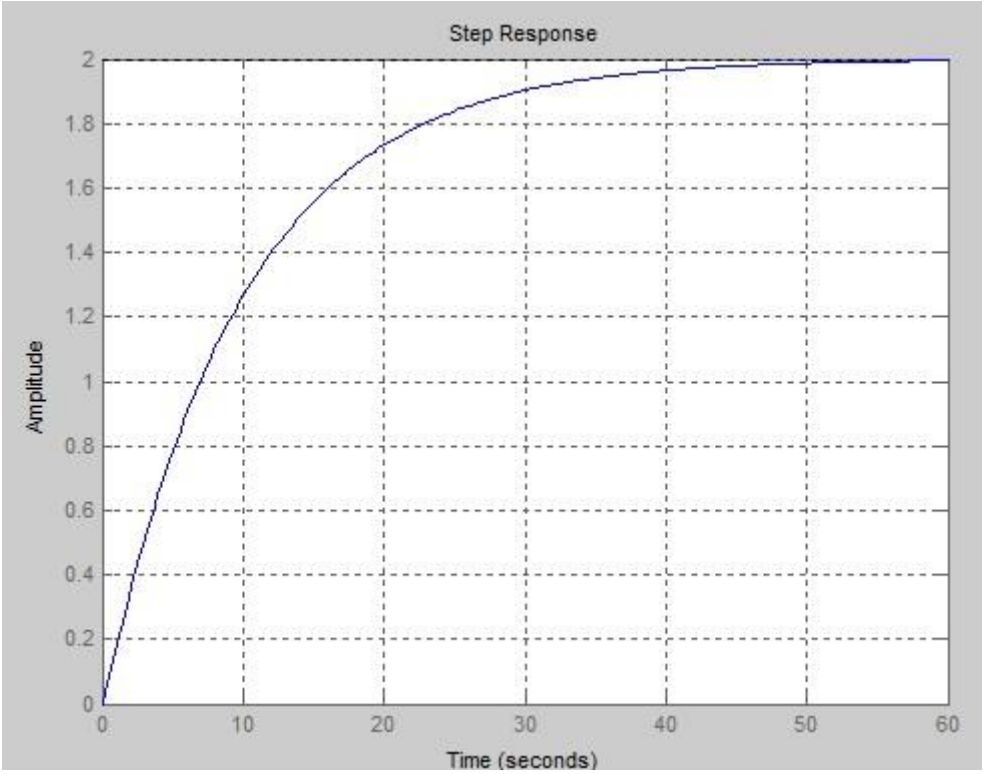


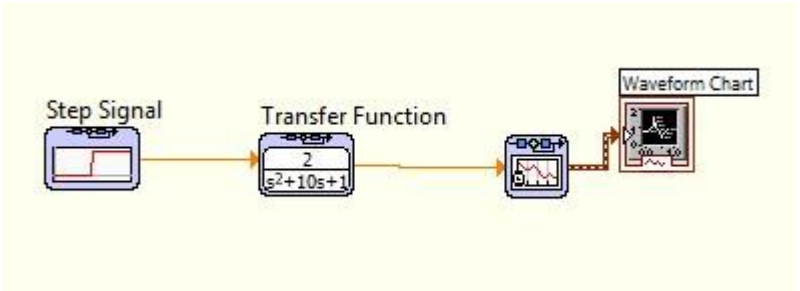

Step Signal
Transfer Function
2
s²+2s+1
Waveform Chart

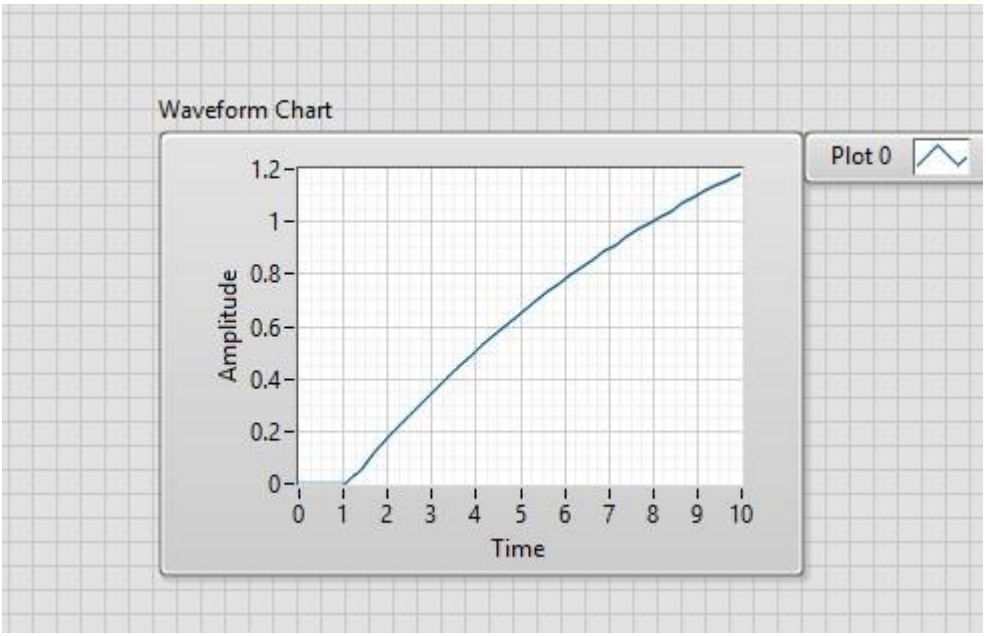

Waveform Chart
Plot 0
Amplitude
2
1.5
1
0.5
0
0 1 2 3 4 5 6 7 8 9 10
Time

4)

```
>> num =[2];
den =[1 (2*5) 1];
sys =tf(num,den)
step(sys)
grid

sys =

        2
  -------------
  s^2 + 10 s + 1

Continuous-time transfer function.
```

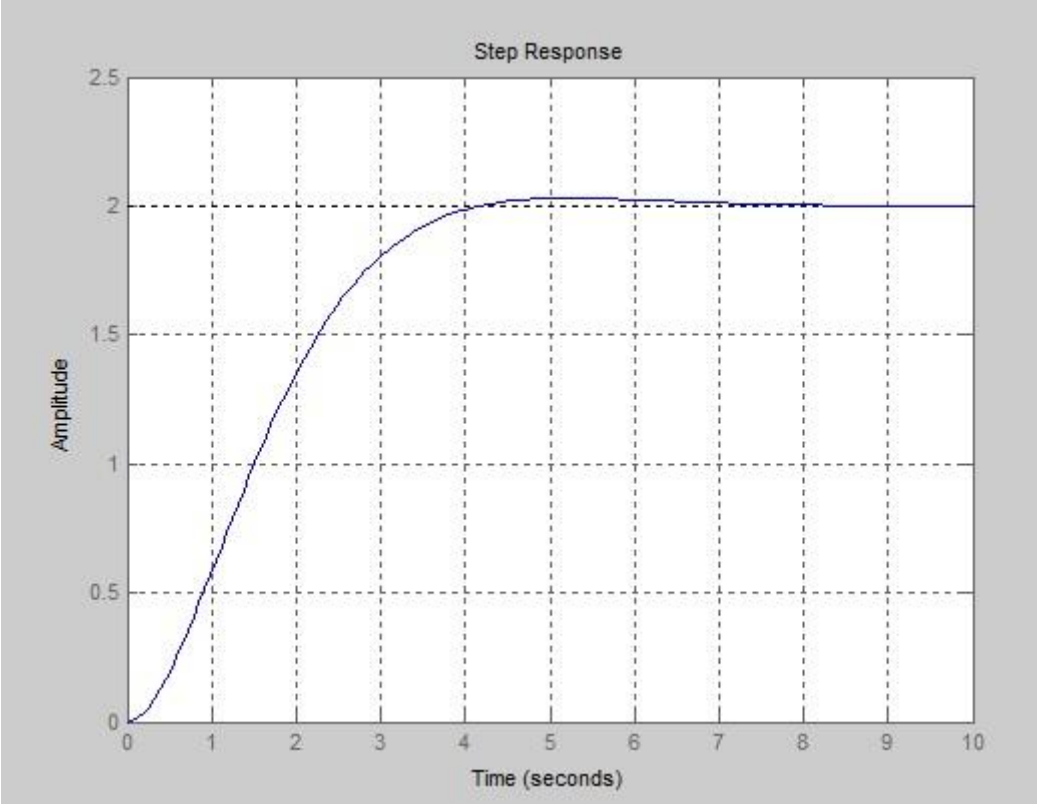


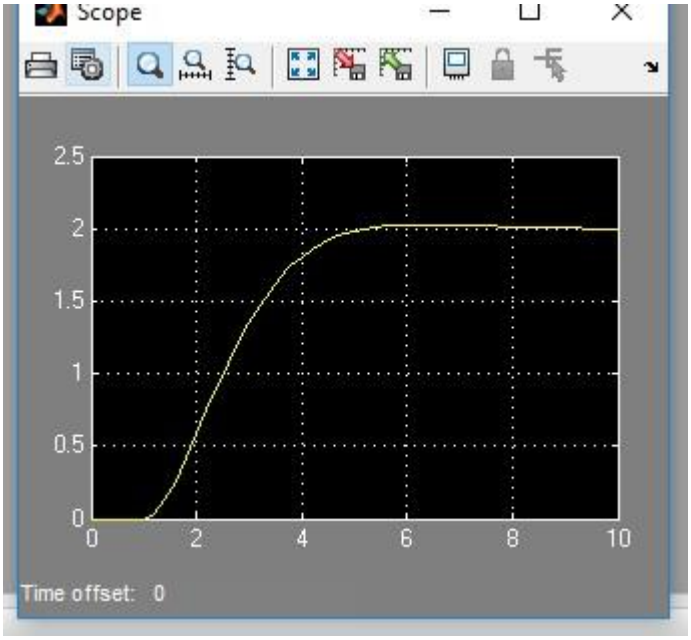

Step Signal
Transfer Function
2
s²+10s+1
Waveform Chart

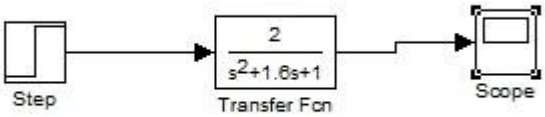

Waveform Chart
Plot 0
Amplitude
1.2
1
0.8
0.6
0.4
0.2
0
0 1 2 3 4 5 6 7 8 9 10
Time

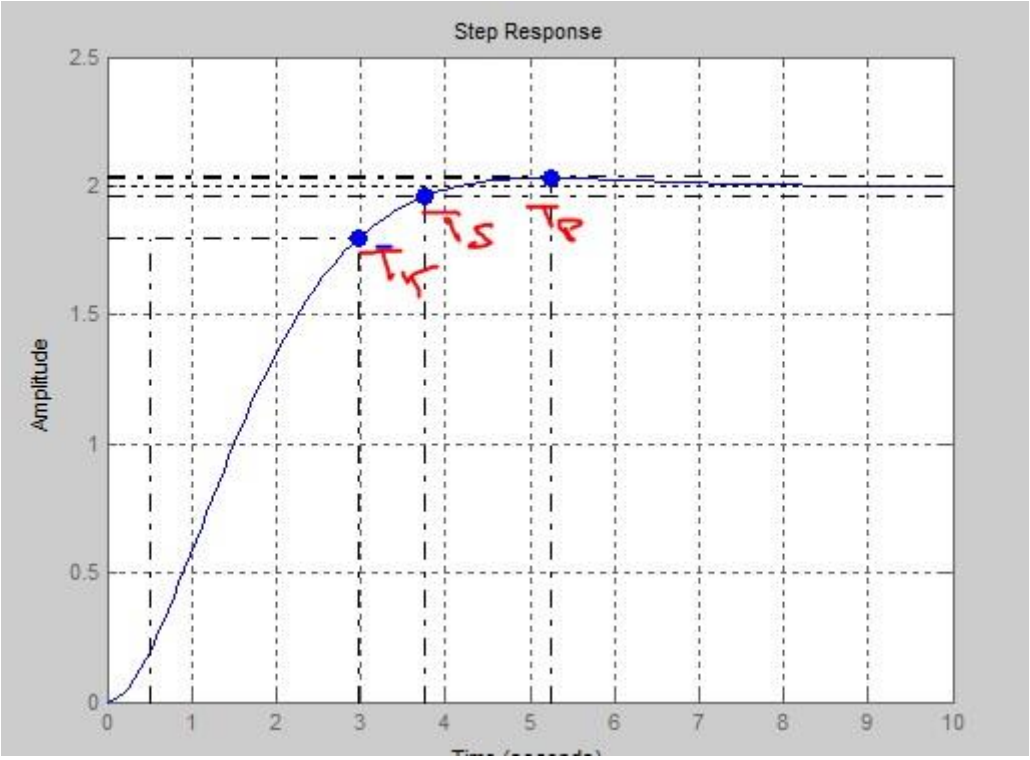
c)

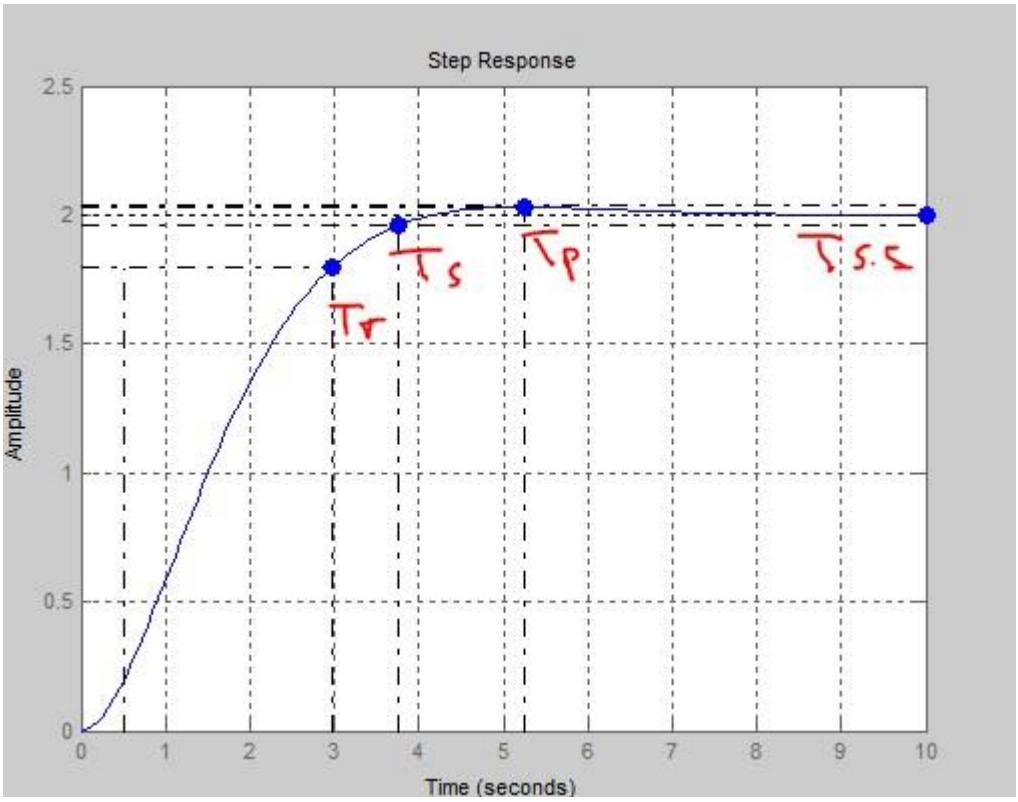
```
>> num =[2];
den =[1 (2*0.8) 1];
sys =tf(num,den)
step(sys)
grid

sys =

          2
  ---------------
  s^2 + 1.6 s + 1

Continuous-time transfer function.

fx >>
```




Scope
2.5
2
1.5
1
0.5
0
0
2
4
6
8
10
Time offset: 0

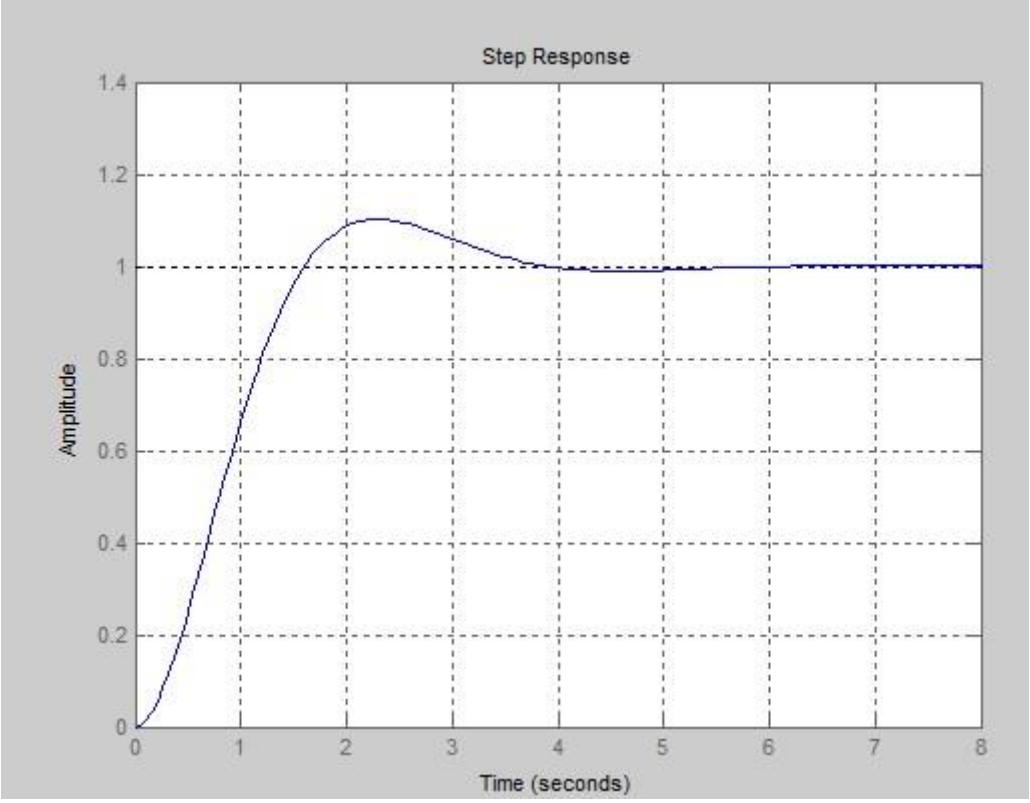

2
s2+1.6s+1
Step
Transfer Fcn
Scope

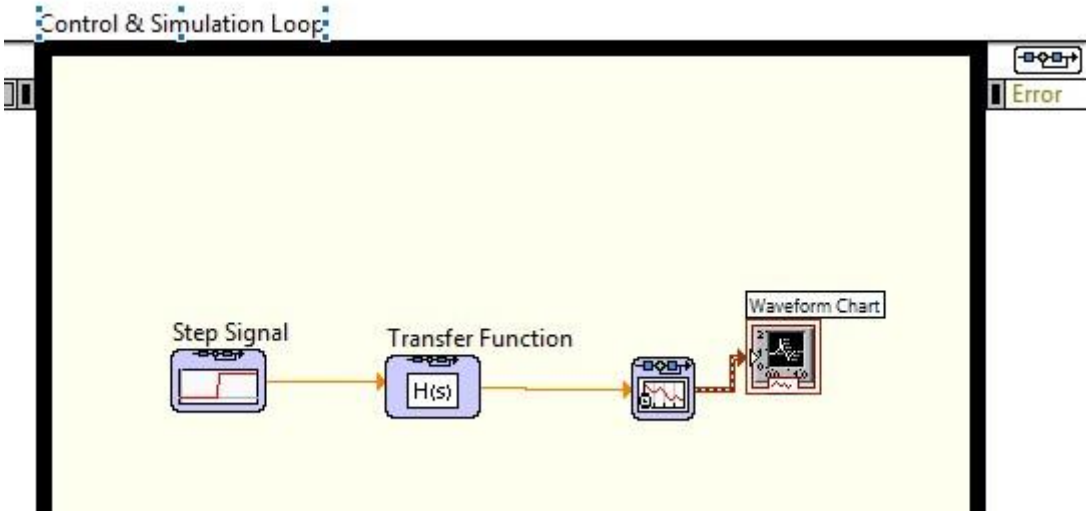

Step Response
Amplitude
2.5
2
1.5
1
0.5
0
0
1
2
3
4
5
6
7
8
9
10
TS
TP

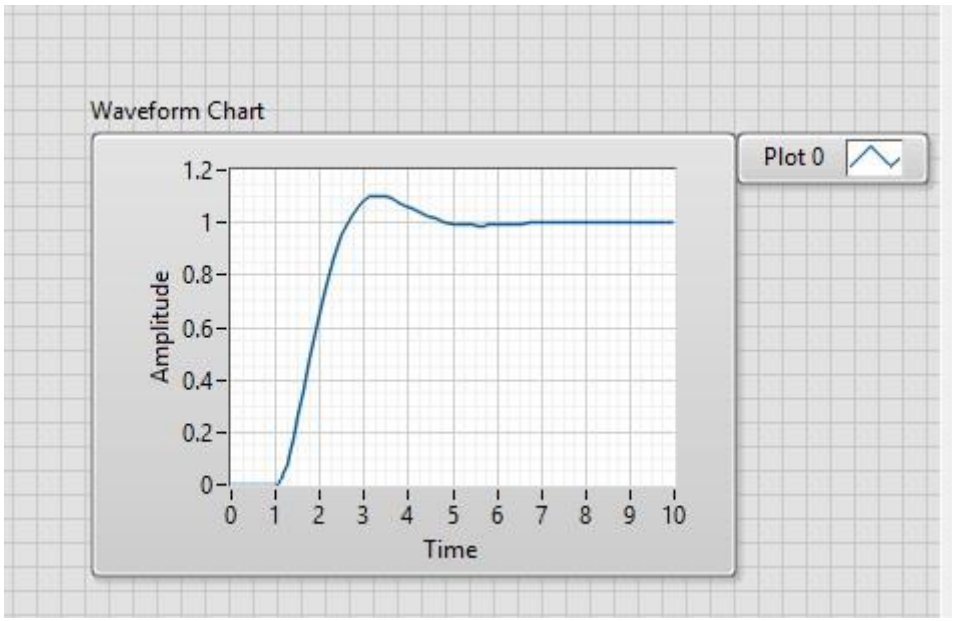

Step Response
Amplitude
Time (seconds)
0
0.5
1
1.5
2
2.5
0
1
2
3
4
5
6
7
8
9
10
Tr
Ts
Tp
Ts.s

Q2)

```
>> num =[2.87];
den =[1 (1.99) 2.87];
sys =tf(num,den)
step(sys)
grid

sys =

         2.87
  -------------------
  s^2 + 1.99 s + 2.87

Continuous-time transfer function.

>>
```




Control & Simulation Loop
Error
Step Signal
Transfer Function
H(s)
Waveform Chart


Waveform Chart
Plot 0
Amplitude
1.2
1
0.8
0.6
0.4
0.2
0
0 1 2 3 4 5 6 7 8 9 10
Time