Lab report no 4

Fall 2022

Control System Lab

Submitted By

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Section: **A**
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Objectives: -

- To understand different combination of LTI system.
- To learn how to find output of series and parallel of system.
- And to compare both resultant of MATLAB and Simulink.

Task no 1: -(Series combination)

Code: -

```
clc
clear all
close all


%g1
num1 = [1];
denum1 =[1 1];
%g(2)
num2 = [1];
denum2 =[1 3];
%g(3)
num3 = [1 3];
denum3 =[1 5];

sys1 = tf( num1,denum1);     %three system g1,g2,g3
sys2 = tf( num2,denum2);
sys3 = tf( num3,denum3);

%series
%first two system in series
series1 = series(sys1,sys2);
%third system in series with two
eq1 = series(series1,sys3);

step(eq1);
```
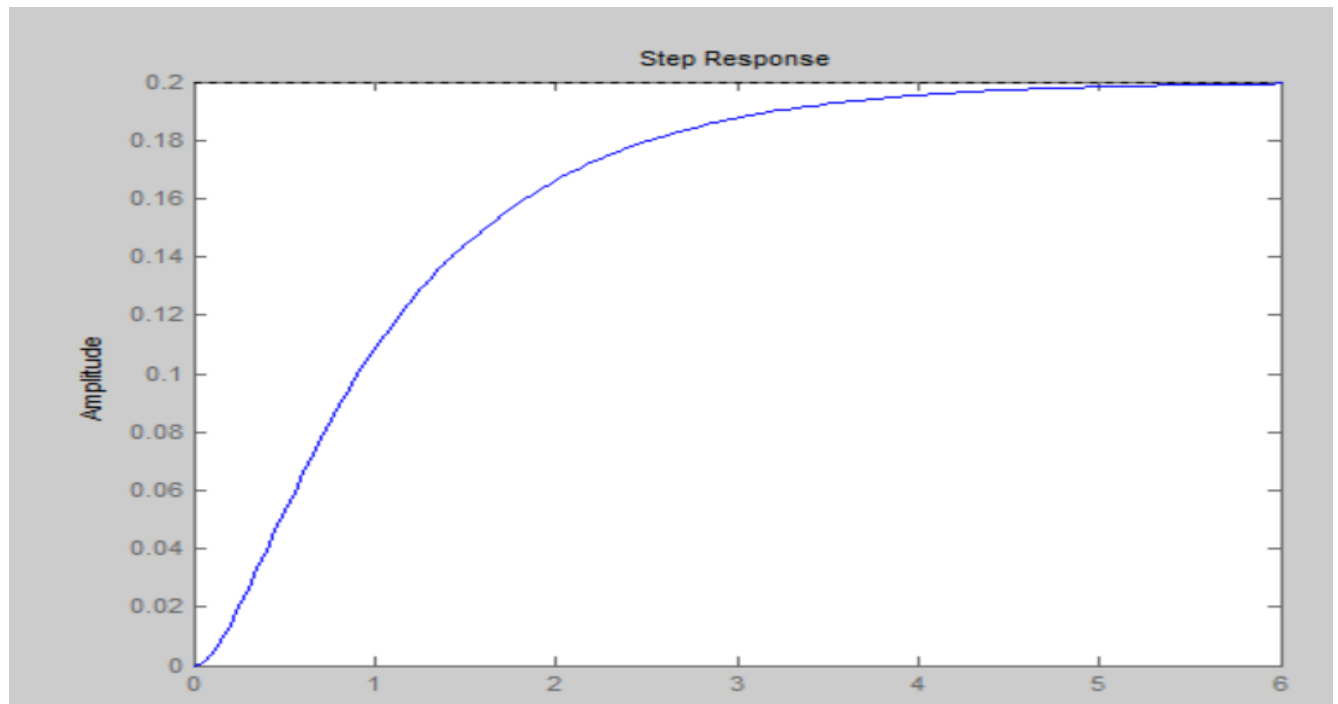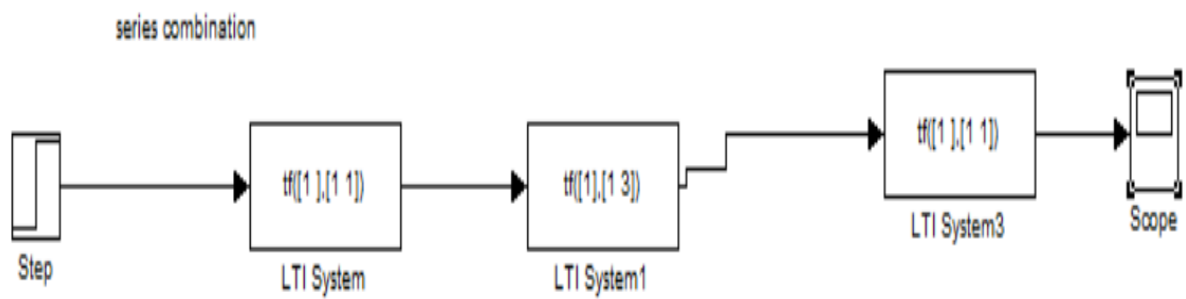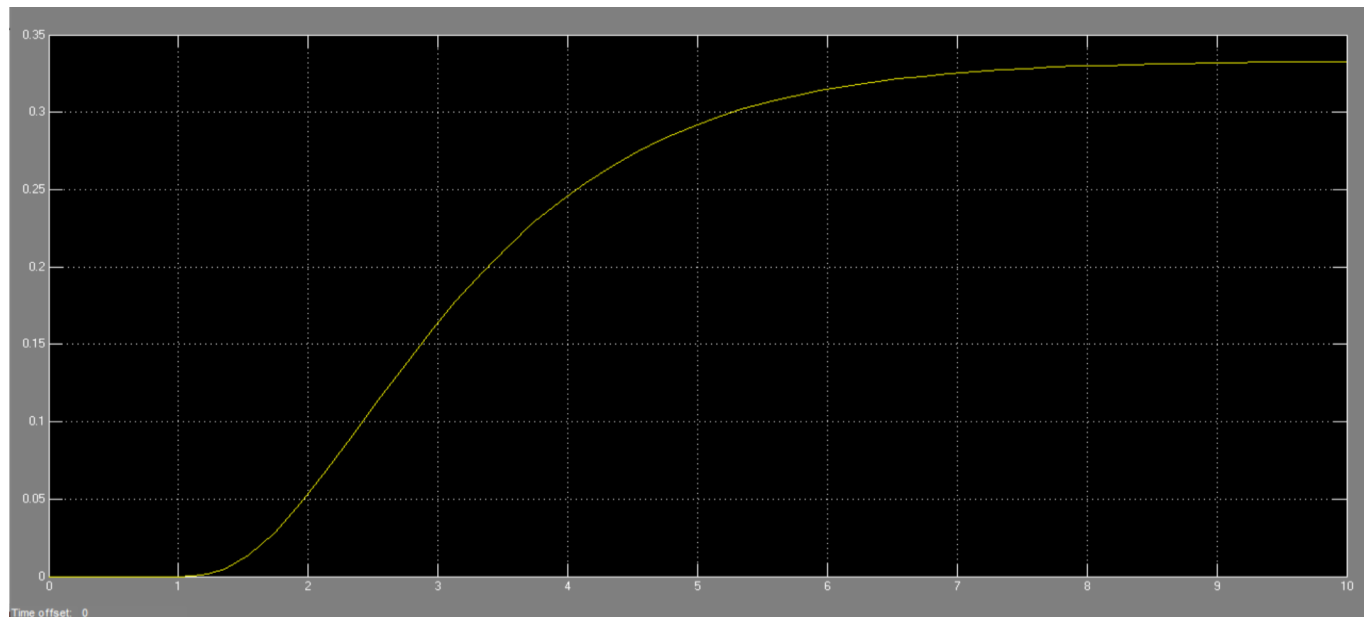
Plot: -

Step Response

Simulink: -

series combination

Step   tf([1],[1 1])   tf([1],[1 3])   tf([1],[1 1])   Scope

LTI System   LTI System1   LTI System3

Scope: -

Task no 2: - (parallel)

Code: -

```
clc
clear all
close all


%g1
num1 = [1];
denum1 =[1 1];
%g(2)
num2 = [1];
denum2 =[1 3];
%g(3)
num3 = [1 3];
denum3 =[1 5];

sys1 = tf( num1,denum1);      %three system g1,g2,g3
sys2 = tf( num2,denum2);
sys3 = tf( num3,denum3);


%parallel
%first two system in series
paralle1 = parallel(sys1,sys2);
```
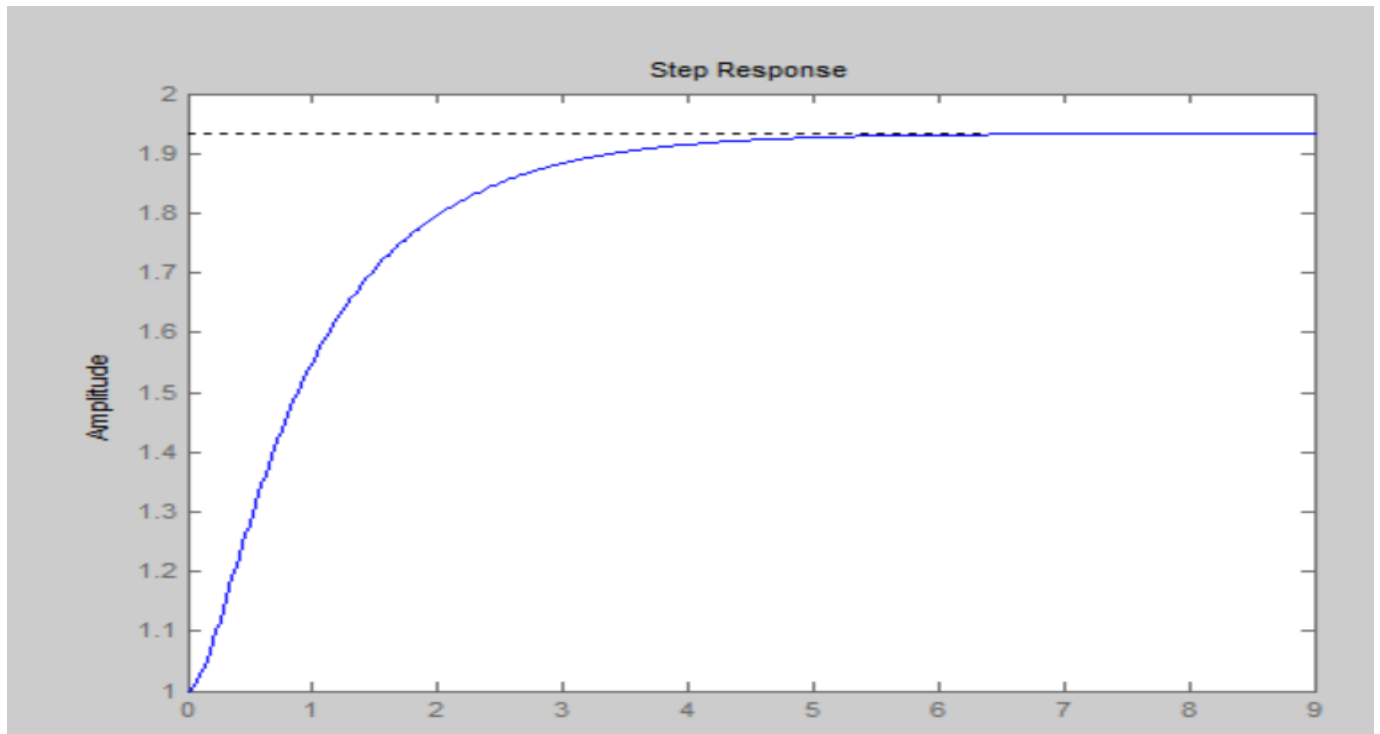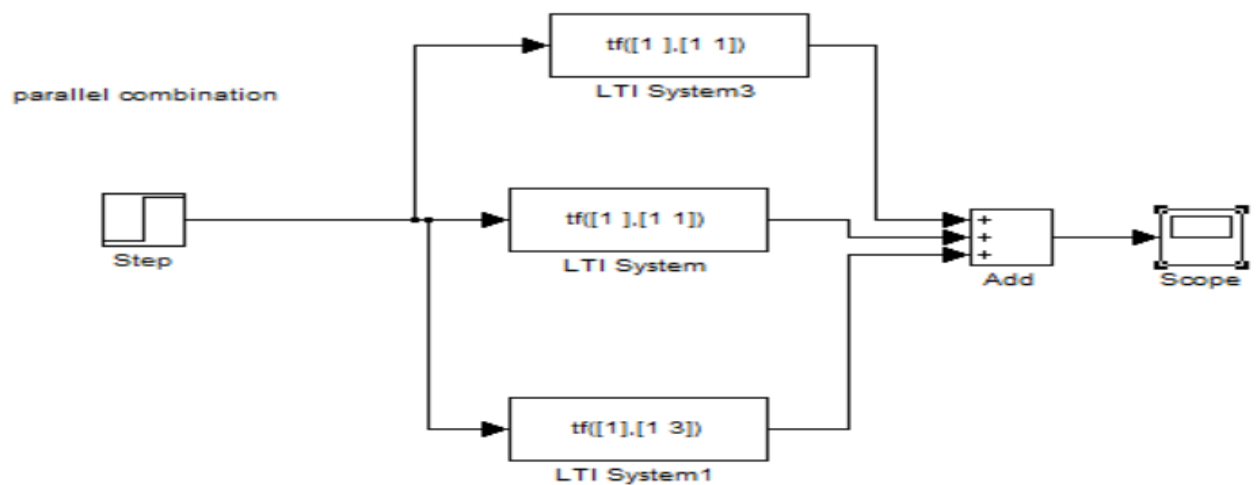
```
%third system in series with two
eq = parallel(parallel,sys3);

step(eq);
```
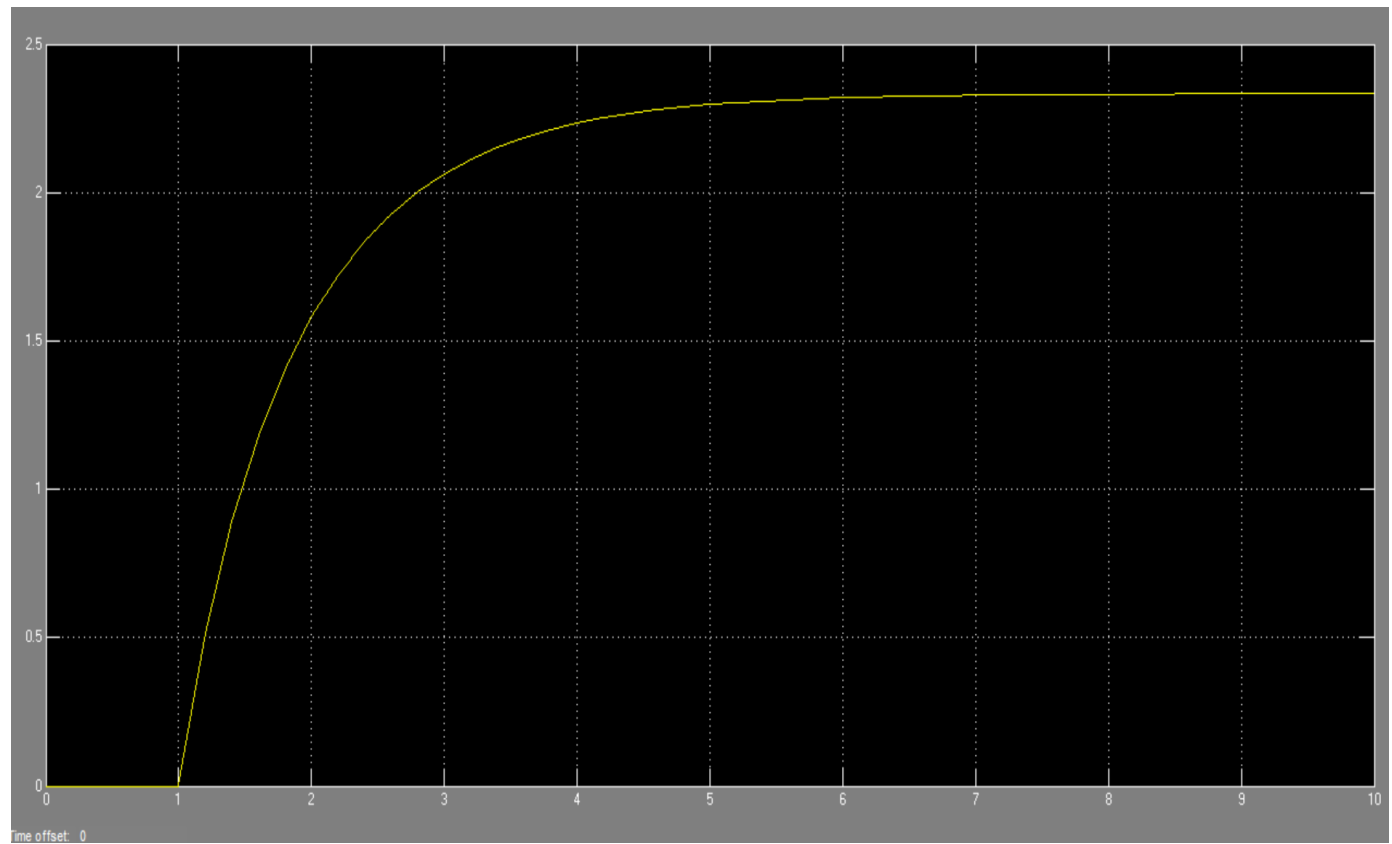
Plot: -

Simulink: -

Scope: -

Task no 3: -

Code: -

```
clc
clear all
close all


%g1
num1 = [1];
denum1 =[1 1];
%g(2)
num2 = [1];
denum2 =[1 3];
```
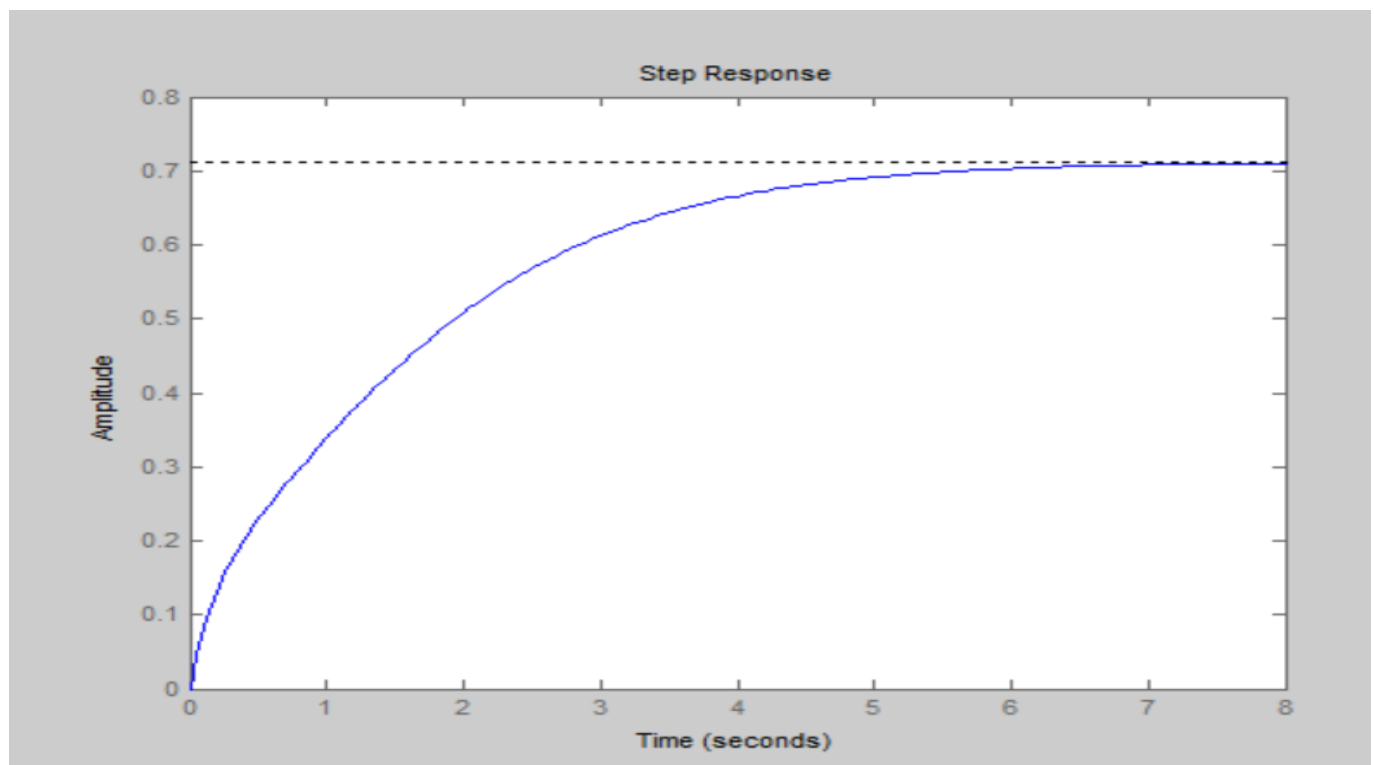
```
%g(3)
num3 = [1 3];
denum3 =[1 5];

sys1 = tf( num1,denum1);
sys2 = tf( num2,denum2);
sys3 = tf( num3,denum3);



series1 = series(sys1,sys2);
parellel1 = parallel(sys3,sys1);
series2 = series(series1,parellel1);


series_eq = series(sys2,sys3);
feedbk = feedback(series_eq,sys3);
eq = parallel(series2,feedbk);
step(eq);
```
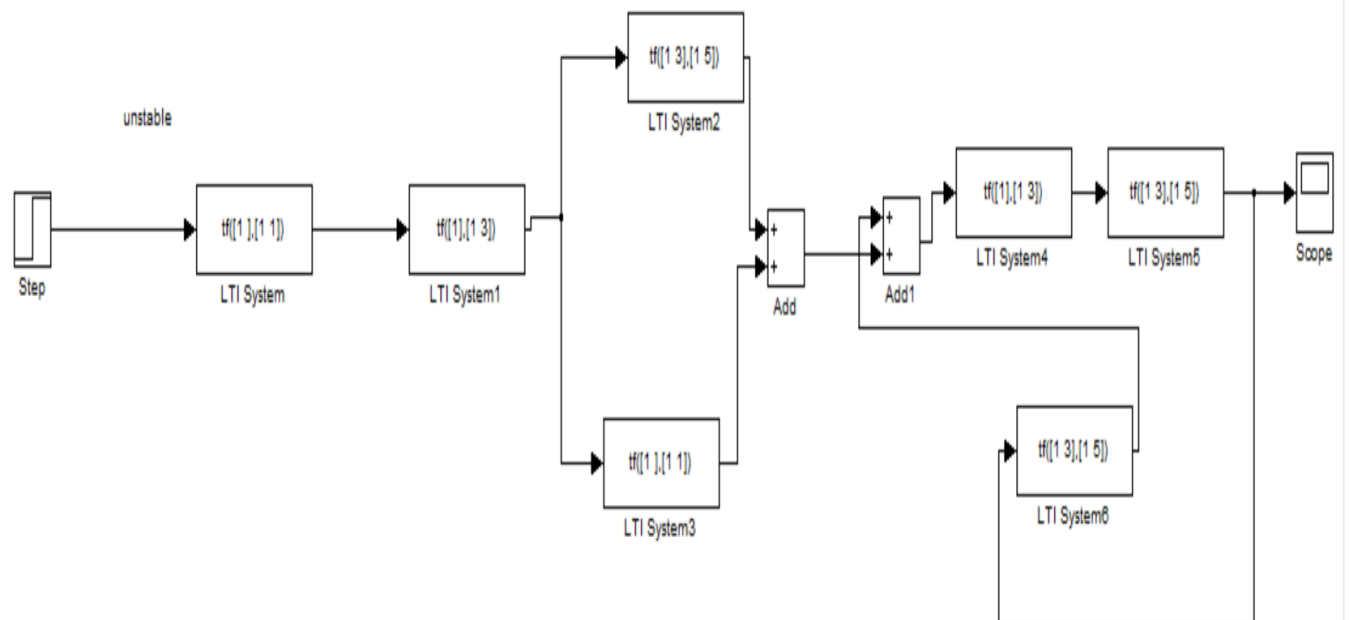
Plot: -

Simulink: -

Scope: -