Lab2

Control

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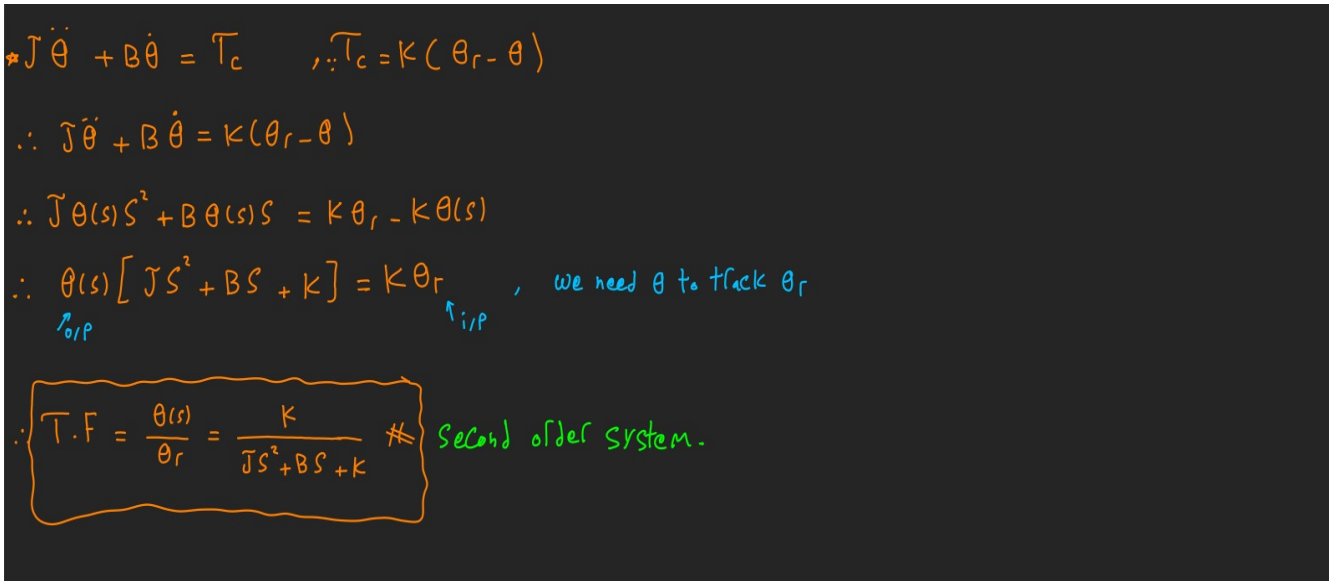
Section: 7

Step A, Closed-loop Transfer Function

Theoretical:

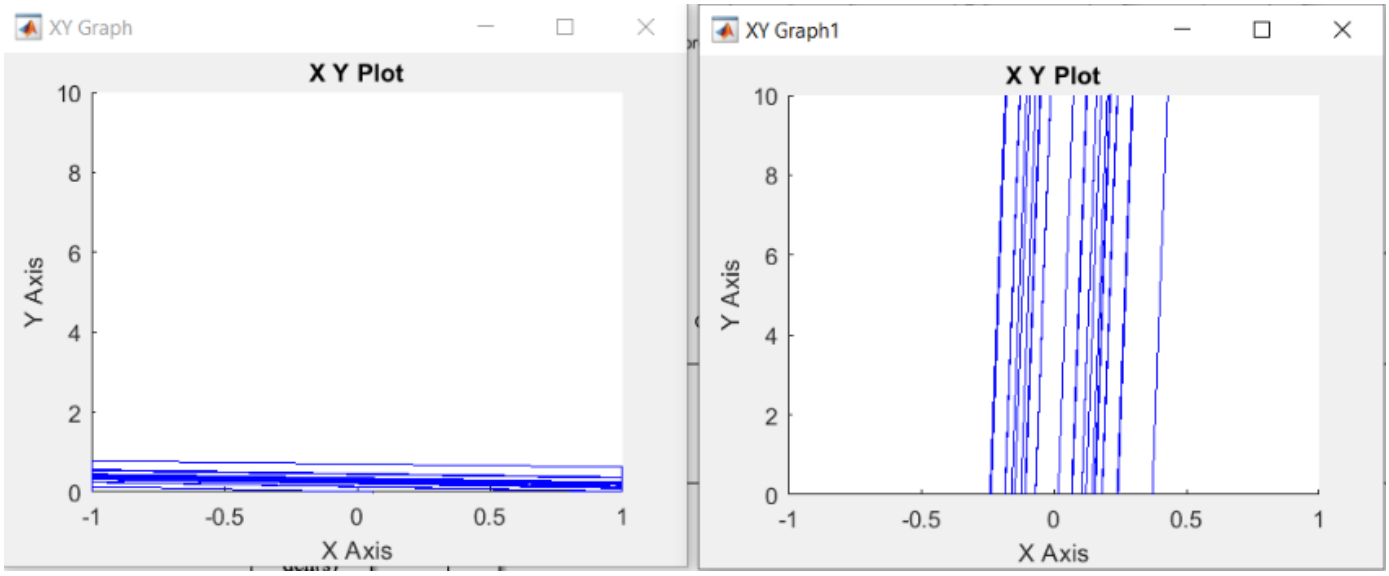


Matlab:

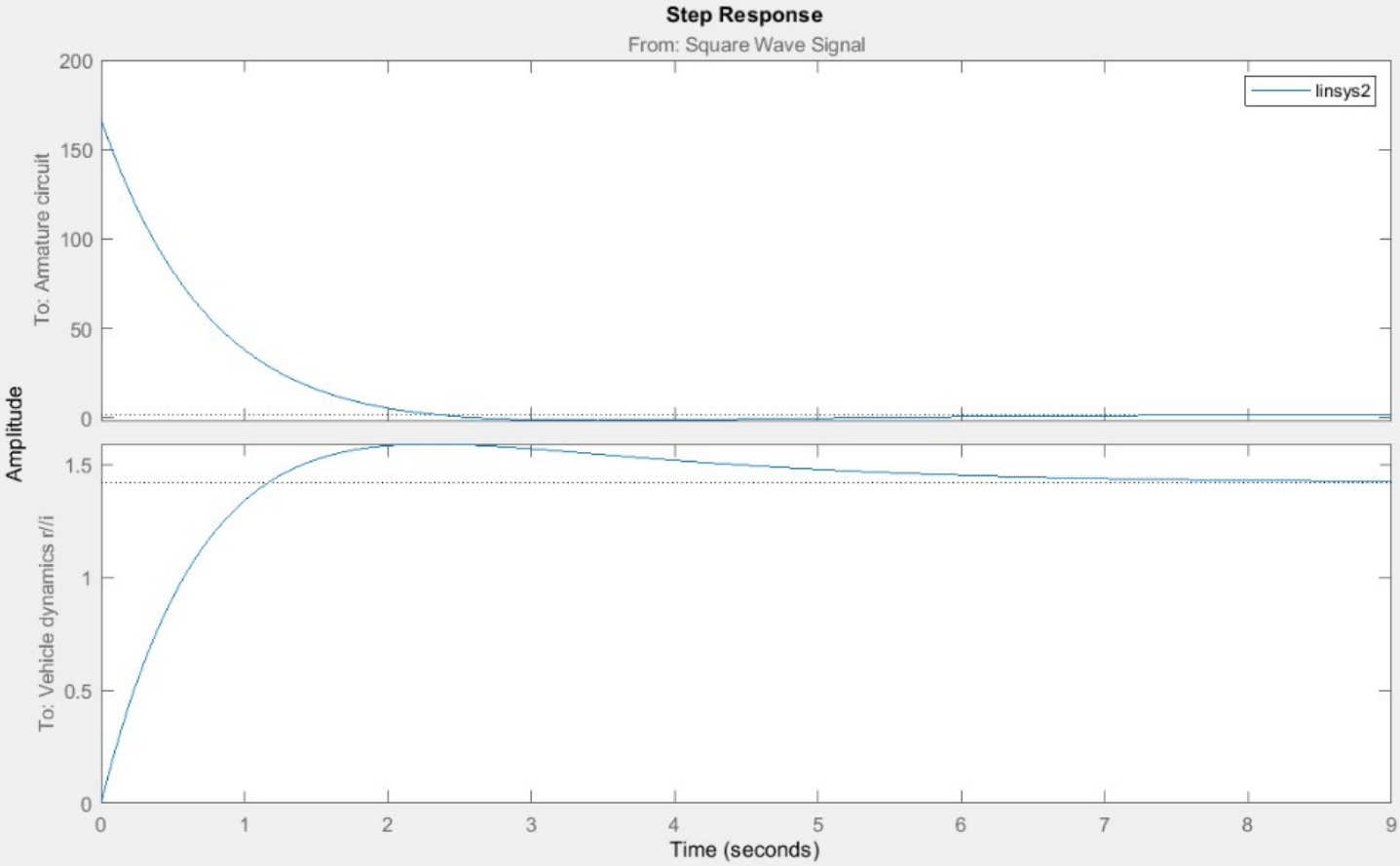
```
%------------a)-----------------%
j = 600000;
b = 20000;
k = 1;

TF = tf(k, [j b k])


```

```
TF =

             1
  ------------------------
  600000 s^2 + 20000 s + 1

Continuous-time transfer function.
```

XY Graph:


XY Graph
X Y Plot
Y Axis
X Axis
10
8
6
4
2
0
-1
-0.5
0
0.5
1
XY Graph1
X Y Plot
Y Axis
X Axis
10
8
6
4
2
0
-1
-0.5
0
0.5
1

Step response:



Transfer functions:

```
>> tf(linsys1)

ans =

  From input "Square Wave Signal" to output...
                     166.7 s^3 + 169.8 s^2 + 43.18 s + 0.7631
   Armature circuit:  ---------------------------------------
                         s^3 + 2.4 s^2 + 1.807 s + 0.4314

                           2.553 s^2 + 2.553 s + 0.6128
   Vehicle dynamics r//i:  -------------------------------
                           s^3 + 2.4 s^2 + 1.807 s + 0.4314

Name: Linearization at model initial condition
Continuous-time transfer function.
```

Part2: Matlab

Editor - C:\Users\dyab\Documents\Semester9\control\lab1\code.m

code.m

```
clc;
clear;
Ra = 1;
utKt = 1.8;
Kcs = 0.5;
Kss = 0.0433;
Kf = 0.1;
Kb = 2;
roCwAv = 0.6154;
r_itot = 0.0615;
```