



**EGE UNIVERSITY  
ELECTRICAL AND ELECTRONICS  
ENGINEERING**

**CONTROL SYSTEMS 1  
LAB-5**

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<b>28.04.2021</b>

## MATLAB KODU

```
clc;clear;close all;
syms s
Ga=1/((s+1)*(3*s+1));
Gb=((s+1)*(s+7))/(s*(s+2)*(s+5));
Gc=((s+1)*(s+3))/(s^2*(s+2)*(s+3));

Kp_a=limit(Ga,s,0)
ess_Kp_a=1/(1+Kp_a)
Kv_a=limit(s*Ga,s,0)
ess_Kv_a=1/Kv_a
Ka_a=limit(s^2*Ga,s,0)
ess_Ka_a=1/Ka_a

Kp_b=limit(Gb,s,0)
ess_Kp_b=1/(1+Kp_b)
Kv_b=limit(s*Gb,s,0)
ess_Kv_b=1/Kv_b
Ka_b=limit(s^2*Gb,s,0)
ess_Ka_b=1/Ka_b

Kp_c=limit(Gc,s,0)
ess_Kp_c=1/(1+Kp_c)
Kv_c=limit(s*Gc,s,0)
ess_Kv_c=1/Kv_c
Ka_c=limit(s^2*Gc,s,0)
ess_Ka_c=1/Ka_c

t=0:0.1:10;
y=(t.^2)/2;
u=timeseries(y,t)
```

A, B, C şıklarında verilen sistemler için hata sabitlerini ve birim basamak, birim rampa ve parabolik girişler uygulayarak kararlı hal hatasını simulink modelinin kurulması ve gözlemlenmesi

$$\text{Parabolik giriş işareti} = \frac{t^2}{2}$$

$$\text{A- } G(s) = \frac{1}{(s+1)(3s+1)}$$

$$\text{B- } G(s) = \frac{(s+1)(s+7)}{s(s+2)(s+5)}$$

$$\text{C- } G(s) = \frac{(s+1)(s+3)}{s^2(s+2)(s+3)}$$

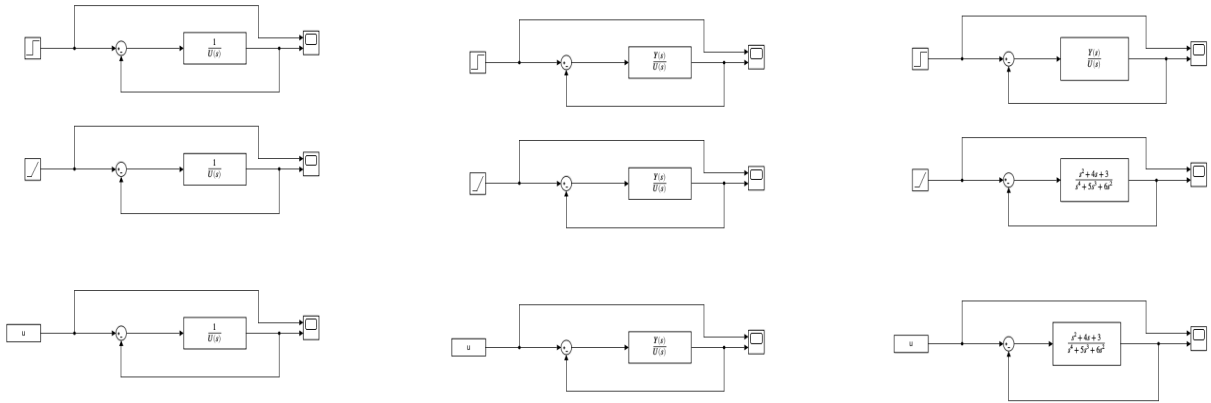


Figure 1 A, B, C transfer fonksiyonları için simulink modeli

## A IKKI

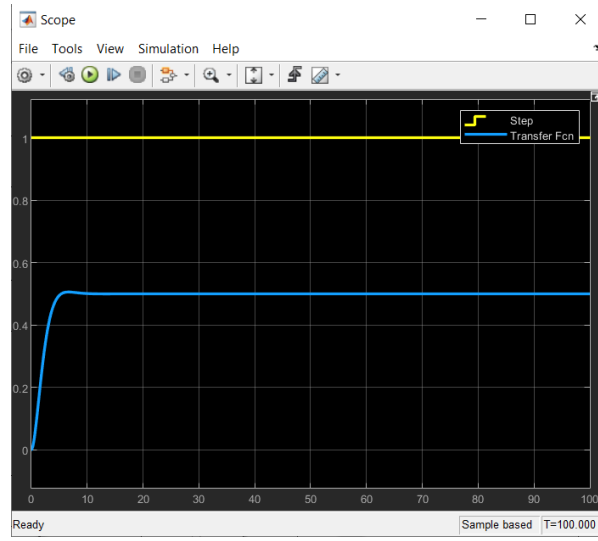


Figure 2 Birim basamak iin kararlı hal hatası

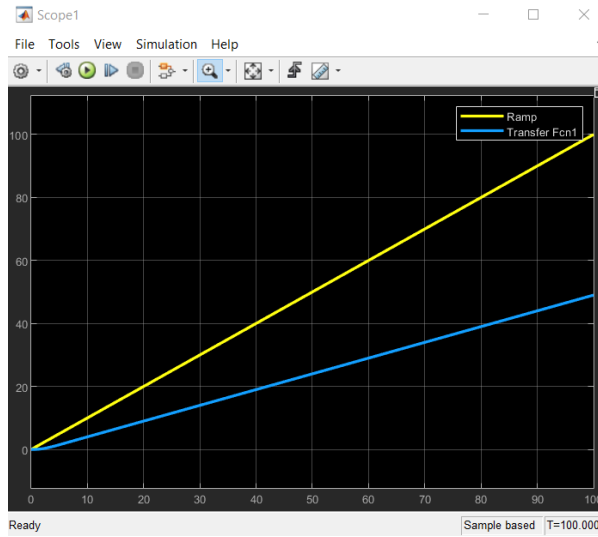


Figure 3 Rampa giriři iin kararlı hal hatası

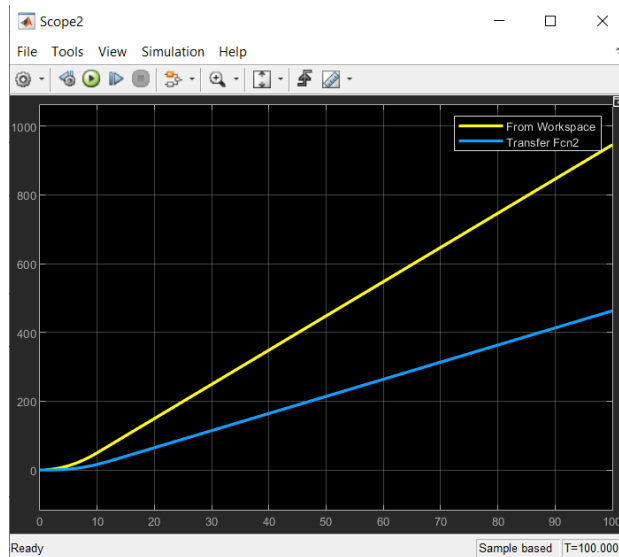


Figure 4 Parabolik giriř iin kararlı hal hatası

## B- ŞIKKI

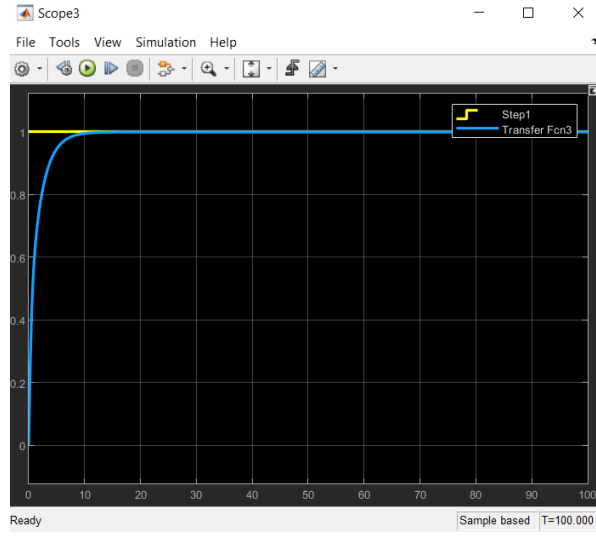


Figure 5 Birim basamak için kararlı hal hatası

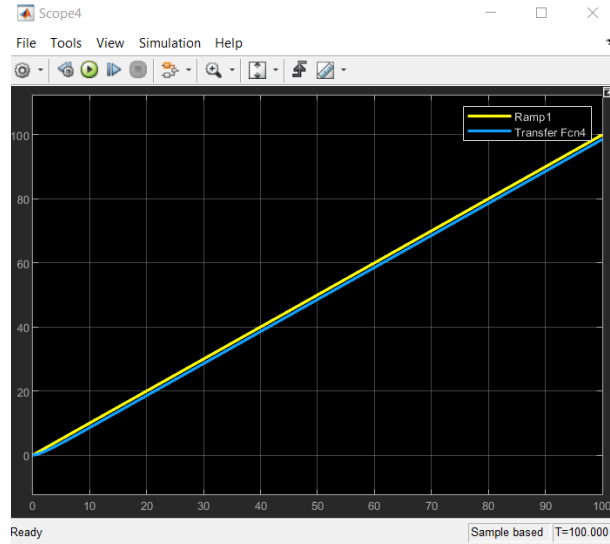


Figure 6 Rampa girişi için kararlı hal hatası

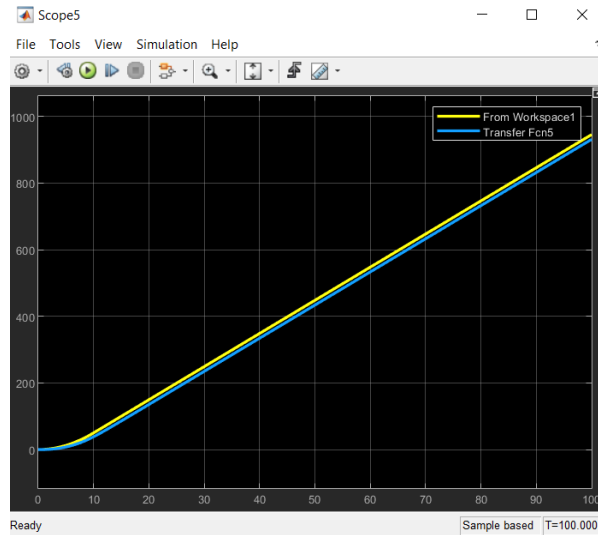


Figure 7 Parabolik giriş için kararlı hal hatası

## C- ŞIKKI

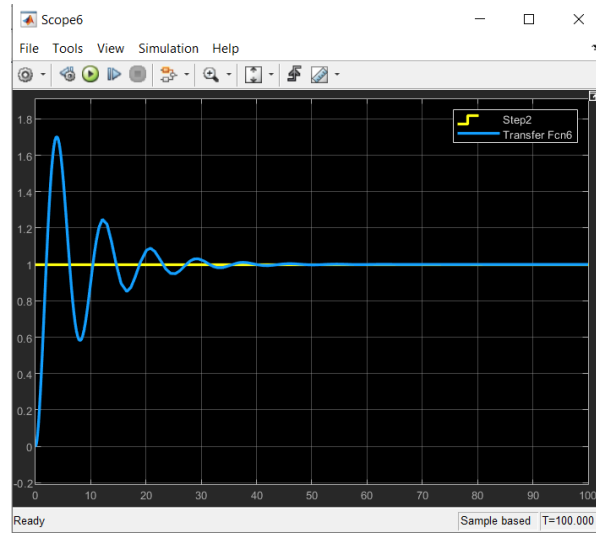


Figure 8 Birim basamak için kararlı hal hatası

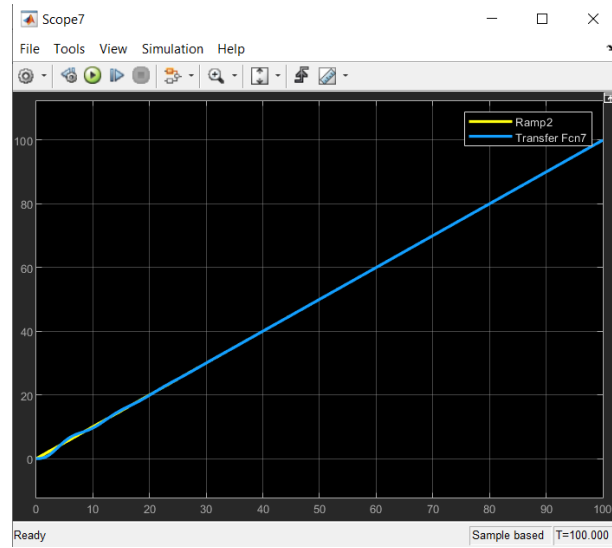


Figure 9 Rampa girişi için kararlı hal hatası

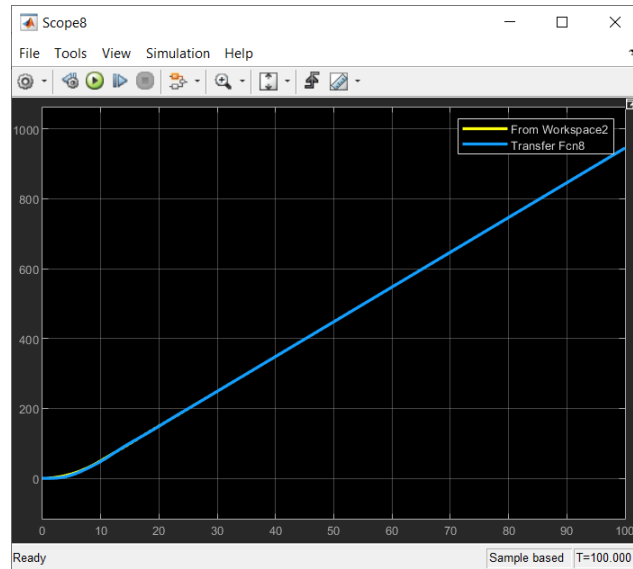


Figure 10 Parabolik giriş için kararlı hal hatası