%% 11.a Mathematical Models & Time Domain Analysis of LTI systems

%% 11.c Time domain analysis and steady state errors

clc;

clear;

s=tf('s')

G = 1/(s^2 + 3\*s +6)

figure(1)

step(G),grid

%% 11.b Block diagram reduction techniques

clc;

clear;

s=tf('s')

G1 = 1/(s+10)

G2 = 1/(s+1)

G3 = (s^2 +1)/(s^2 + 4\*s + 4)

G4 = (s+1)/(s+6)

H1 = (s+1)/(s+2)

H2 = 2

H3 = 1

H2 = H2/G4

sys = feedback(series(G3,G4),H1,+1)

sys = feedback(series(G2,sys),H2,-1)

sys = feedback(series(G1,sys),H3,-1)

**Output Command:**

s =

s

Continuous-time transfer function.

G =

1

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s^2 + 3 s + 6

Continuous-time transfer function.

G1 =

1

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s + 10

Continuous-time transfer function.

G2 =

1

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s + 1

Continuous-time transfer function.

G3 =

s^2 + 1

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s^2 + 4 s + 4

Continuous-time transfer function.

G4 =

s + 1

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s + 6

Continuous-time transfer function.

H1 =

s + 1

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s + 2

Continuous-time transfer function.

H2 =

2

H3 =

1

H2 =

2 s + 12

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s + 1

Continuous-time transfer function.

sys =

s^4 + 3 s^3 + 3 s^2 + 3 s + 2

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10 s^3 + 46 s^2 + 78 s + 47

Continuous-time transfer function.

sys =

s^5 + 4 s^4 + 6 s^3 + 6 s^2 + 5 s + 2

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12 s^5 + 84 s^4 + 222 s^3 + 291 s^2 + 212 s + 71

Continuous-time transfer function.

sys =

s^5 + 4 s^4 + 6 s^3 + 6 s^2 + 5 s + 2

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12 s^6 + 205 s^5 + 1066 s^4 + 2517 s^3 + 3128 s^2 + 2196 s + 712

Continuous-time transfer function.

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