Bangladesh University of Business & Technology

Control System Lab

EEE 402

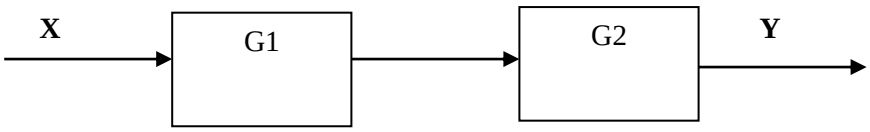
Experiment No: 02

Experiment Name: Block Diagram Reduction using Matlab.

Objectives:

1. To learn commands in Matlab that can be used to reduce linear system blocks.
2. To learn about block diagram reduction by shifting blocks.
3. To learn about the topological reduction of block diagram.

Blocks in Series



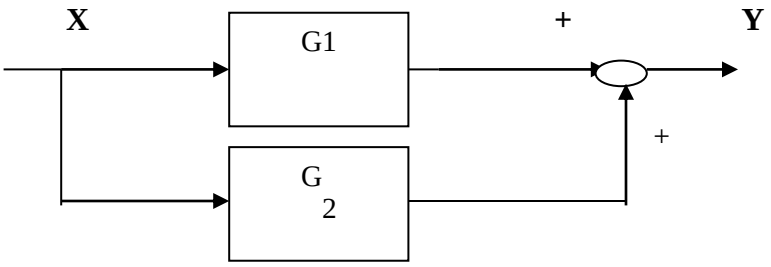
* G1 and G2 are in series.

*commutative

XF= series(G1,G2)

Y= G1G2X

Blocks in Parallel

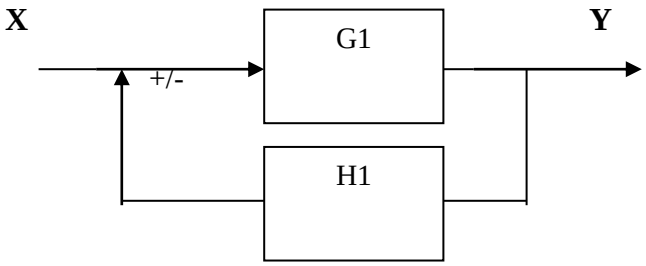


- G1 and G2 are in parallel.
- associative

XF= parallel (G1,G2)

Y= (G1+G2)X

Feedback Loop



- Feedback can be positive or negative.
- For +ve feedback,

$$Y = \frac{G1}{1 - G1H1} X$$

For -ve feedback,

$$Y = \frac{G1}{1 + G1H1} X$$

XF= feedback(G1,H1)

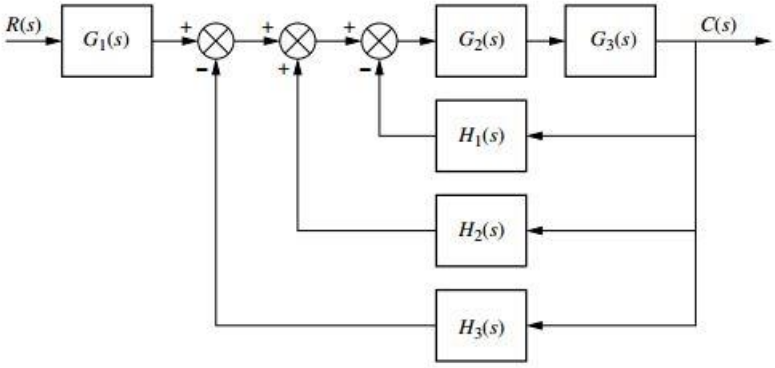
Exercise:

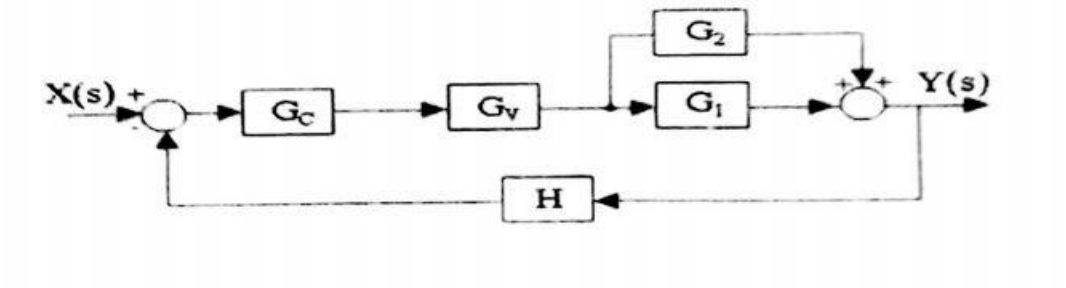
$$G(s) = \frac{s}{s\text{^}2 + s + 4}$$

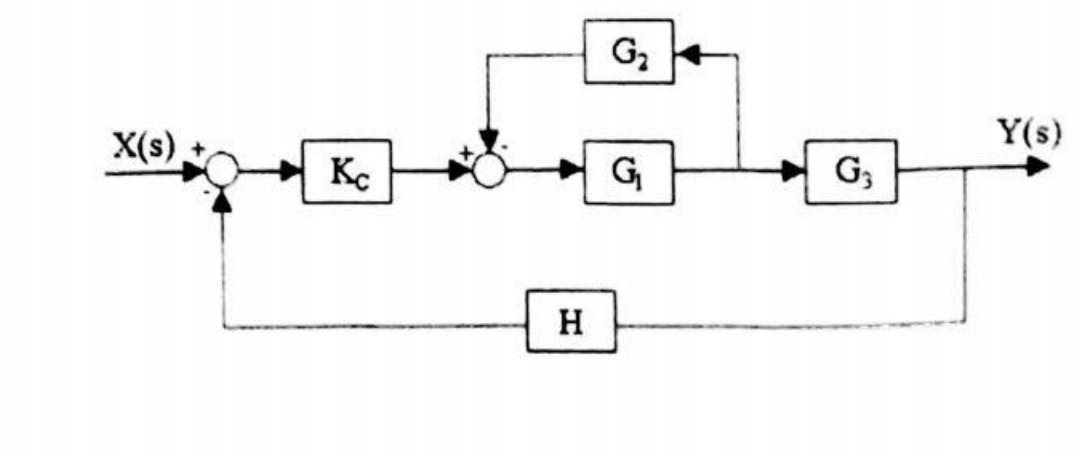
$$H(s) = \frac{5(s+2)}{s+10}$$

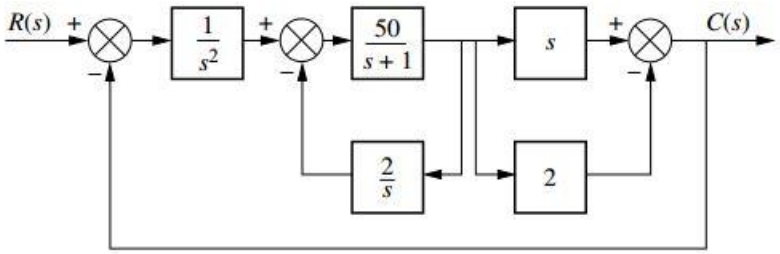
Find out the transfer functions if G(s) & H(s) are in 1)series 2)parallel 3)feedback

Assignments






G2
X(s)
+
-
Kc
+
-
G1
G3
Y(s)
H


R(s)
+
−
1/s²
+
−
50/(s+1)
s
+
−
C(s)
2/s
2