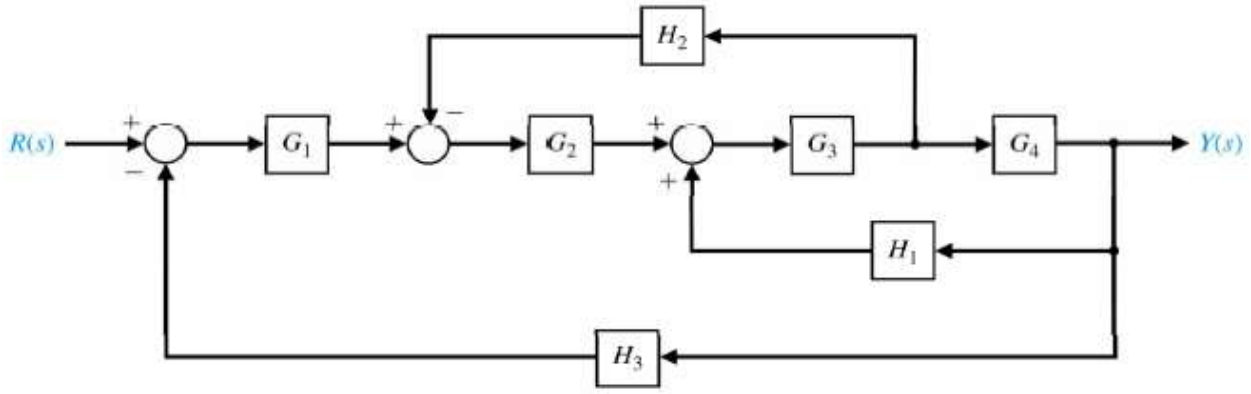
# Control Systems Assignment # 3

issued: 31/05/2022
due: 09/06/2022

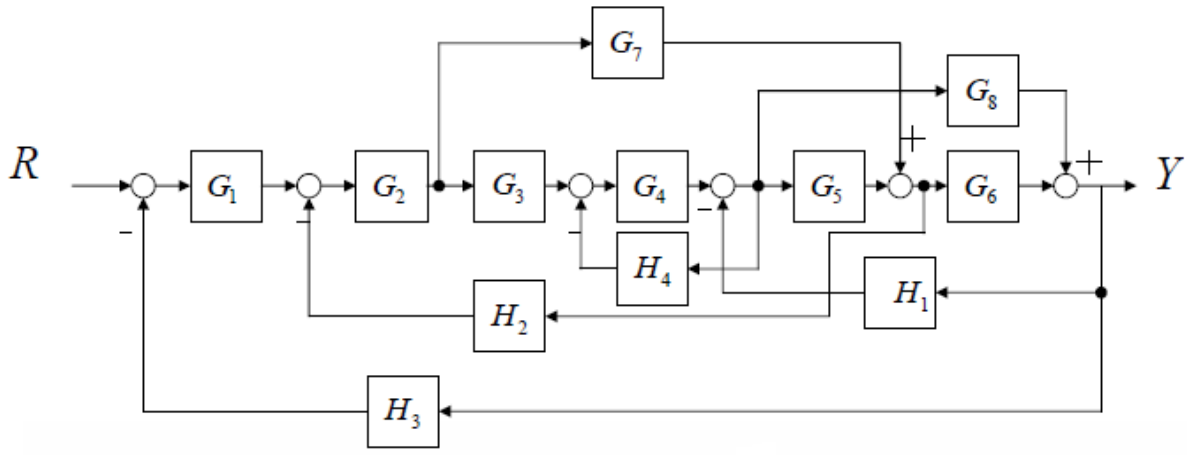
## Problem 1

For the block diagrams given below, construct signal flow graphs and calculate the transfer function from *R* to *Y* using Mason's rule.

(a)




(b)



## Problem 2

Apply Routh Hurwitz on the following systems and determine stability (for unstable systems, write down the number of poles in the ORHP. For stable systems write down whether it is BIBO stable, stable, or asymptotically stable)

a) $G(s) = \frac{3s^3+s}{s^5+4s^4+s^3+3s^2+5s+7}$

b) $G(s) = \frac{-1}{s^4+5s^3+2s^2+3s+1}$

## Problem 3

Design a controller to stabilize the following system by using Routh Hurwitz

$$\boldsymbol{G(s) = \frac{s+1}{s^4+s^3+2s^2-3}}$$