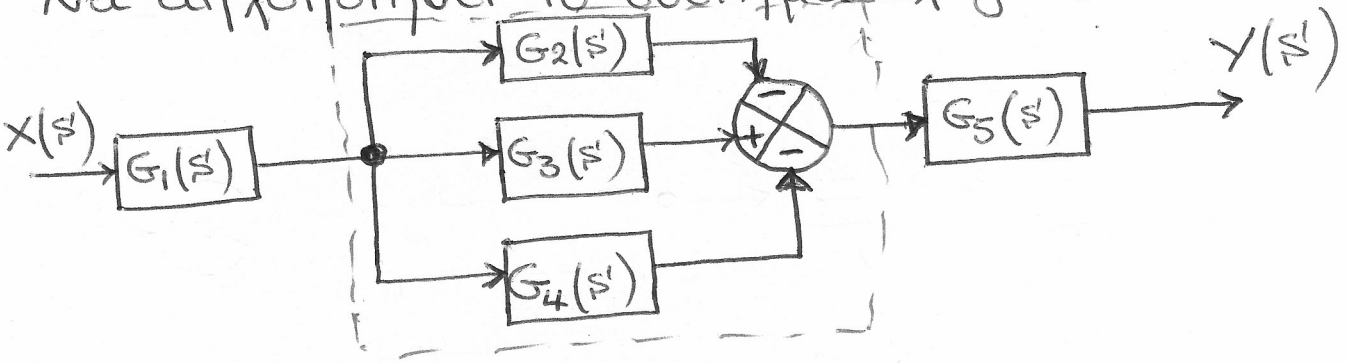
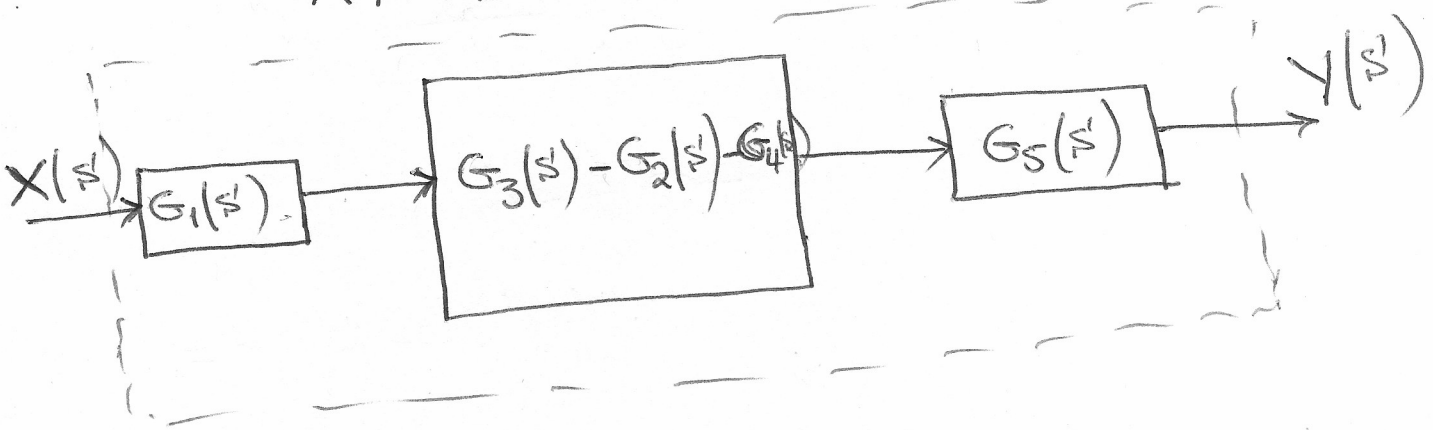
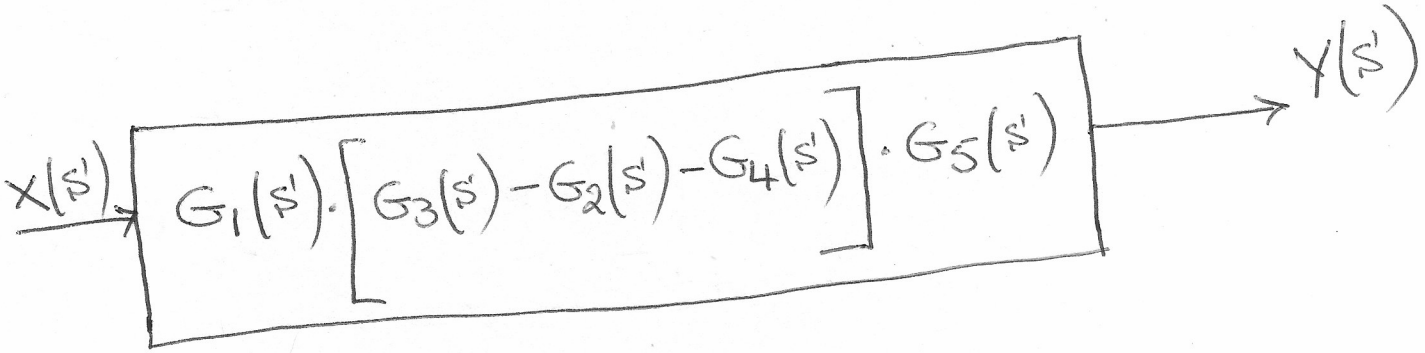
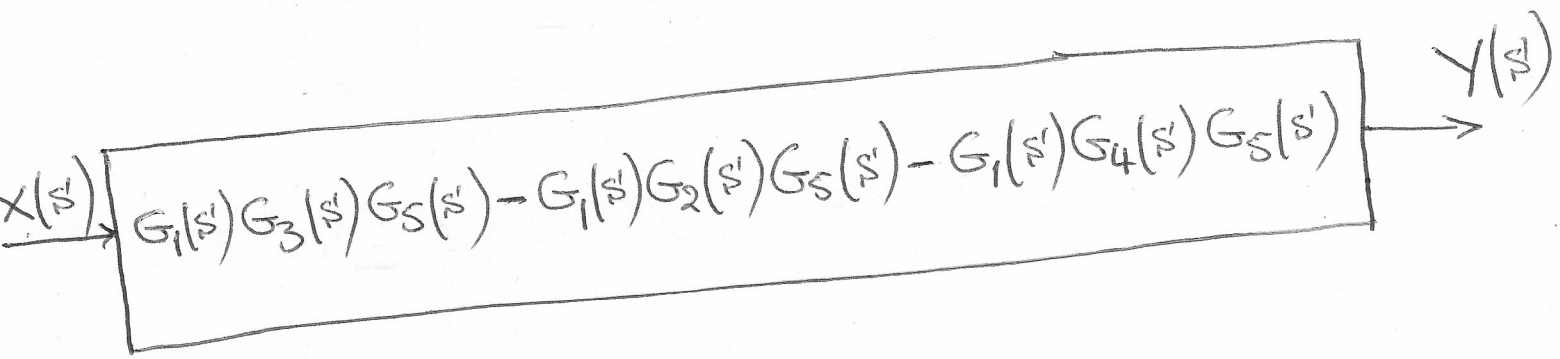
Να απλοποιηθεί το σύστημα ελέγχου.



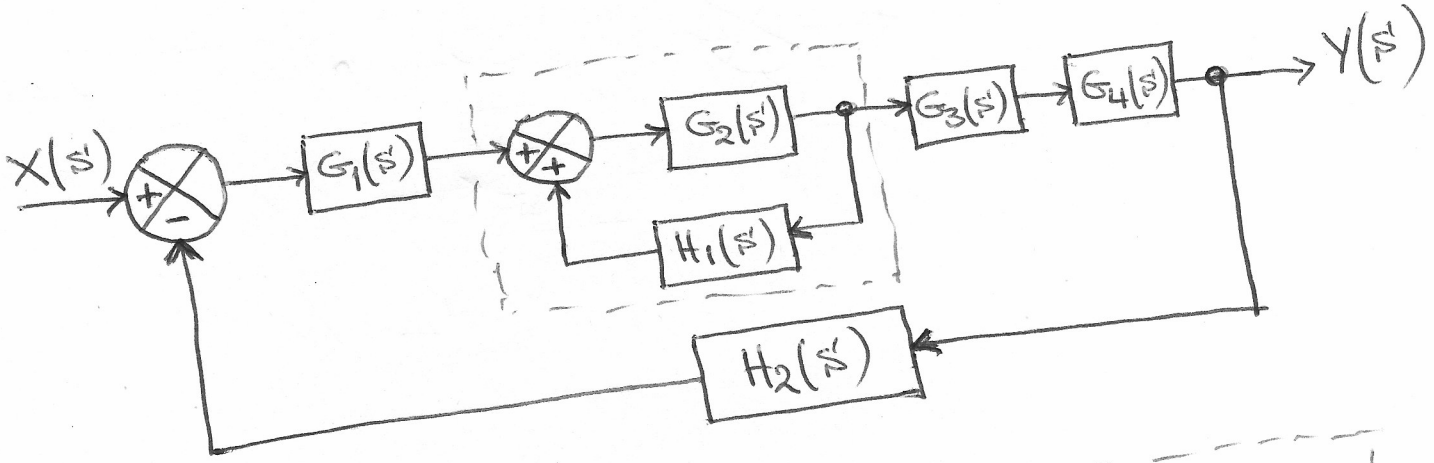
ΛΥΣΗ







Να απλοποιηθεί το σύστημα ελέγχου:



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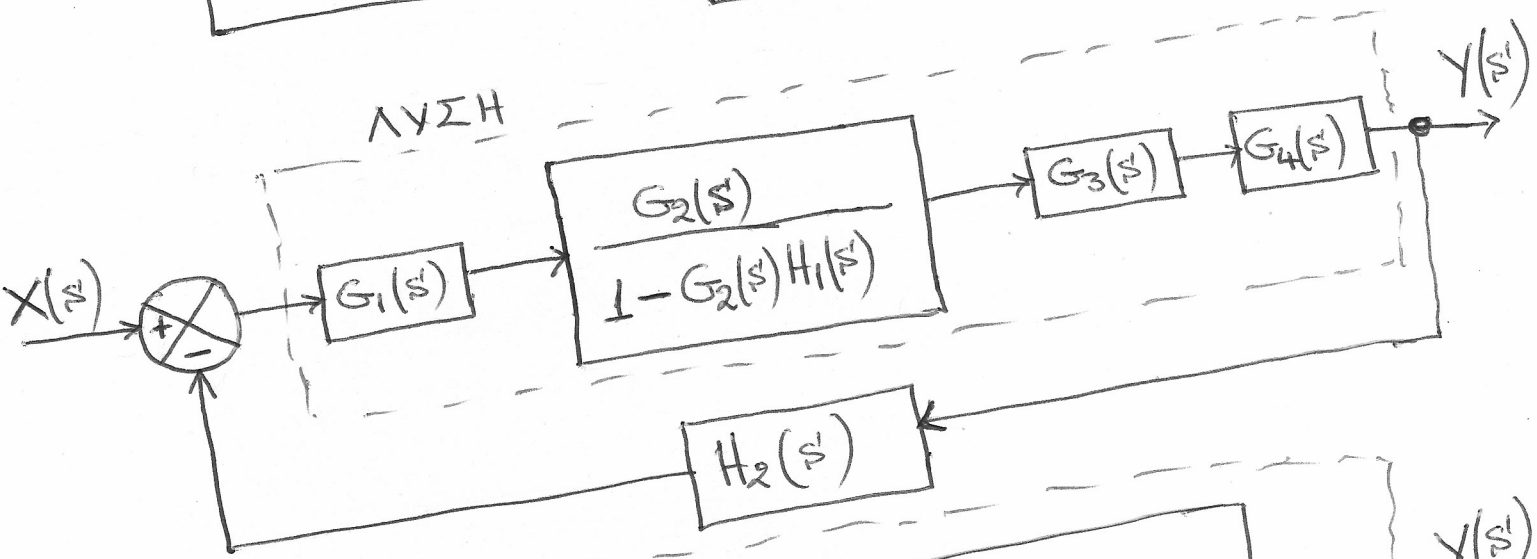
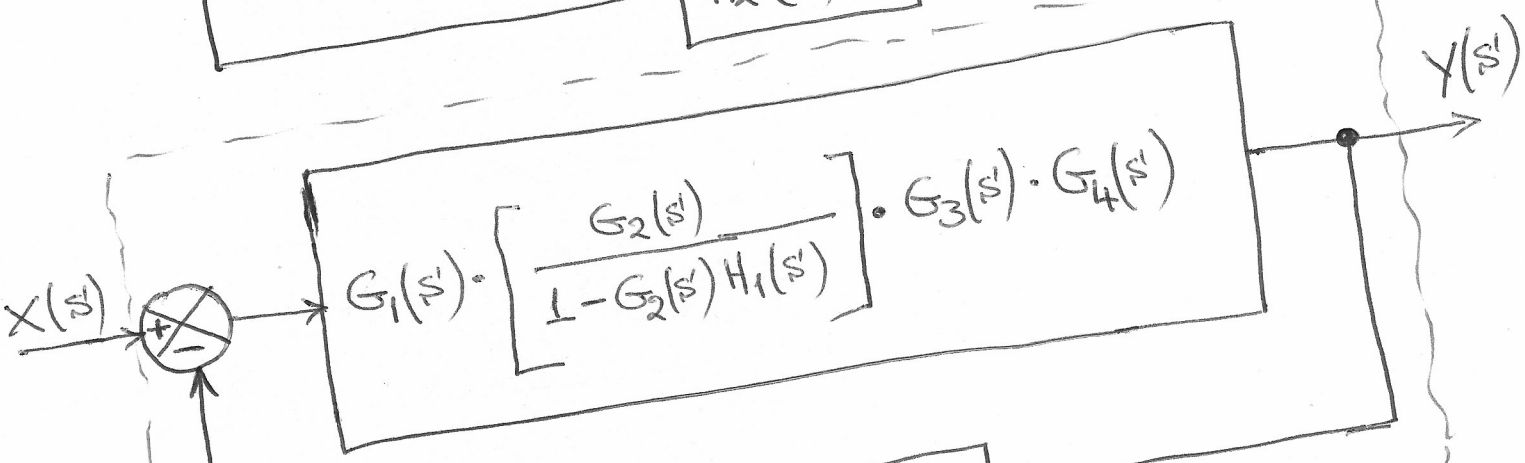


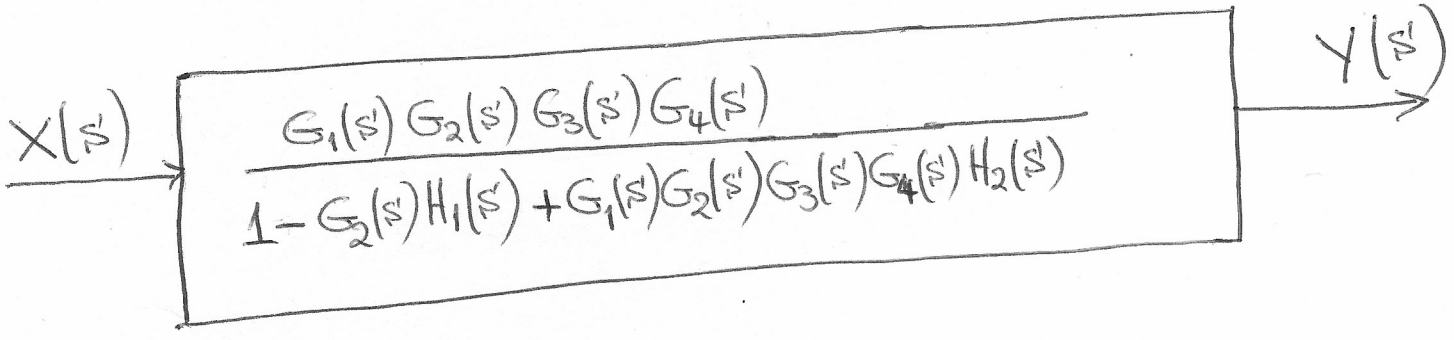


$$X(s) \rightarrow \frac{\dfrac{G_1(s)\,G_2(s)\cdot G_3(s)G_4(s)}{1-G_2(s)\,H_1(s)}}{1+\dfrac{G_1(s)G_2(s)G_3(s)G_4(s)\cdot H_2(s)}{1-G_2(s)H_1(s)}} \rightarrow Y(s)$$

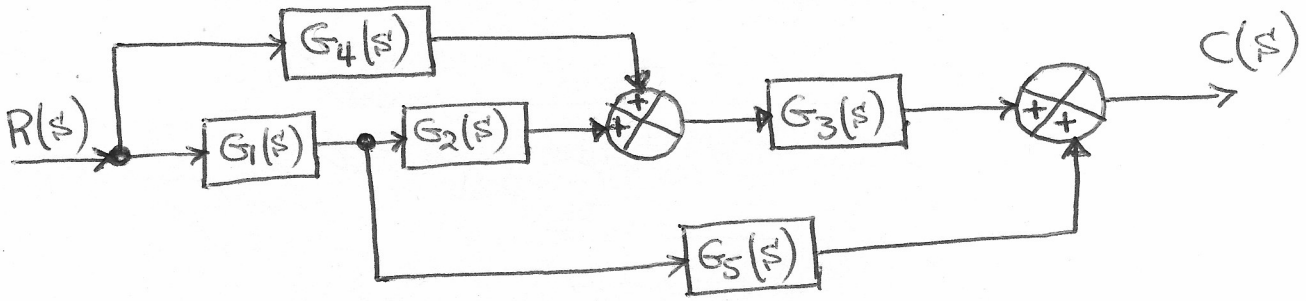
$$F(s) = \frac{Y(s)}{X(s)} = \frac{\dfrac{G_1(s)G_2(s)G_3(s)G_4(s)}{1 - G_2(s)H_1(s)}}{\dfrac{1 - G_2(s)H_1(s) + G_1(s)G_2(s)G_3(s)G_4(s)H_2(s)}{1 - G_2(s)H_1(s)}}$$

$$= \frac{G_1(s)G_2(s)G_3(s)G_4(s)}{1 - G_2(s)H_1(s) + G_1(s)G_2(s)G_3(s)G_4(s)H_2(s)}$$

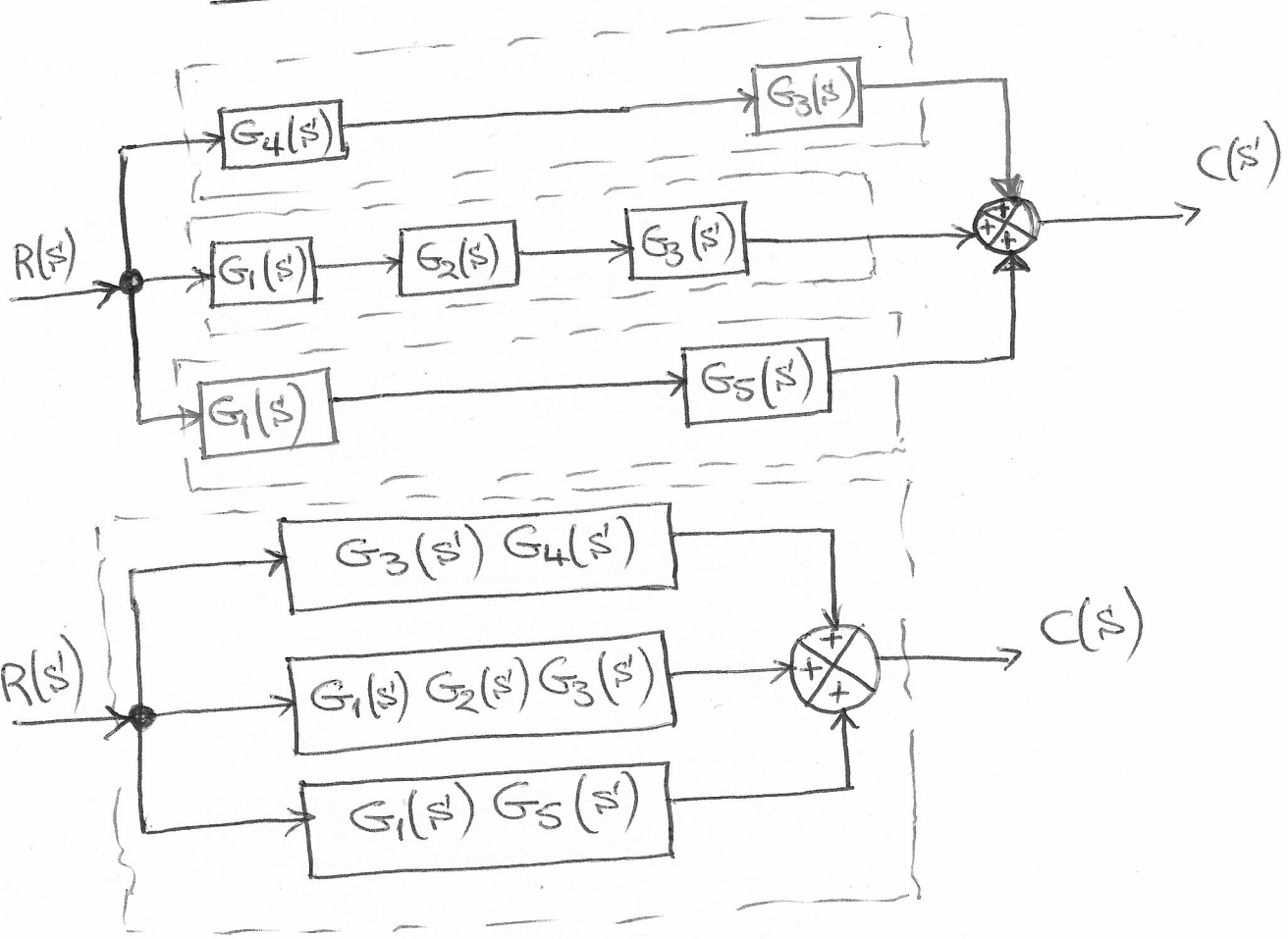
APA.

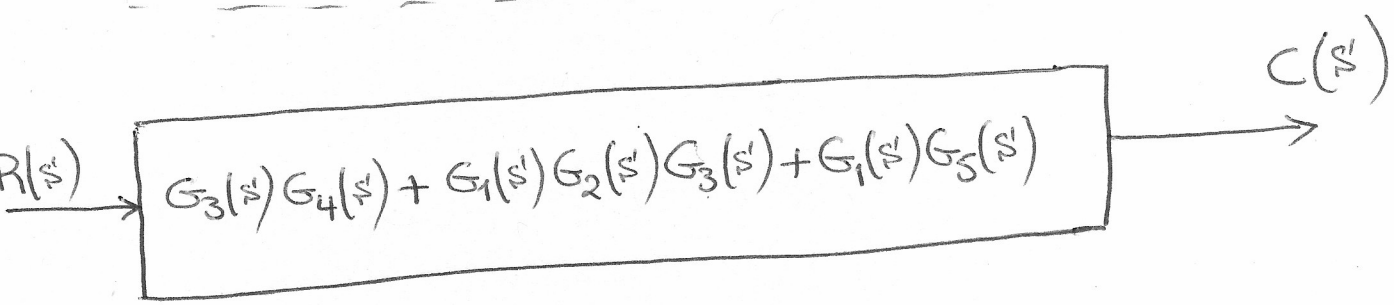


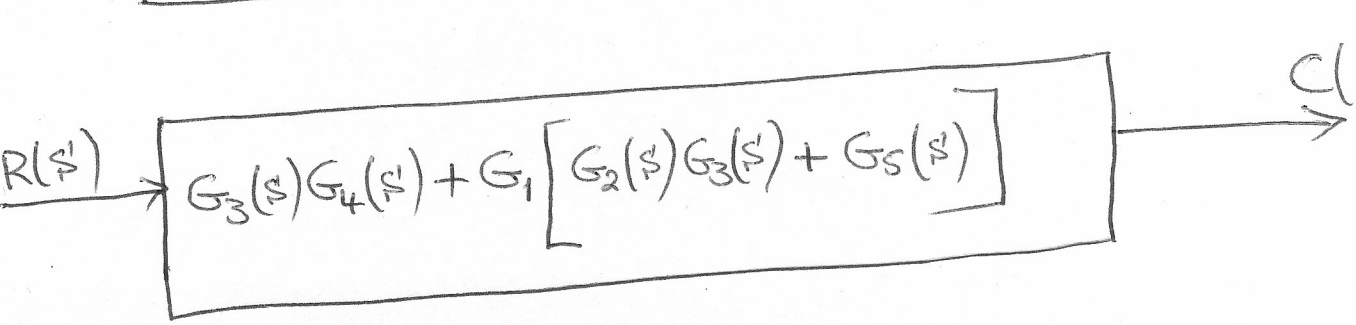
Να απλοποιηθεί το σύστημα ελέγχου.



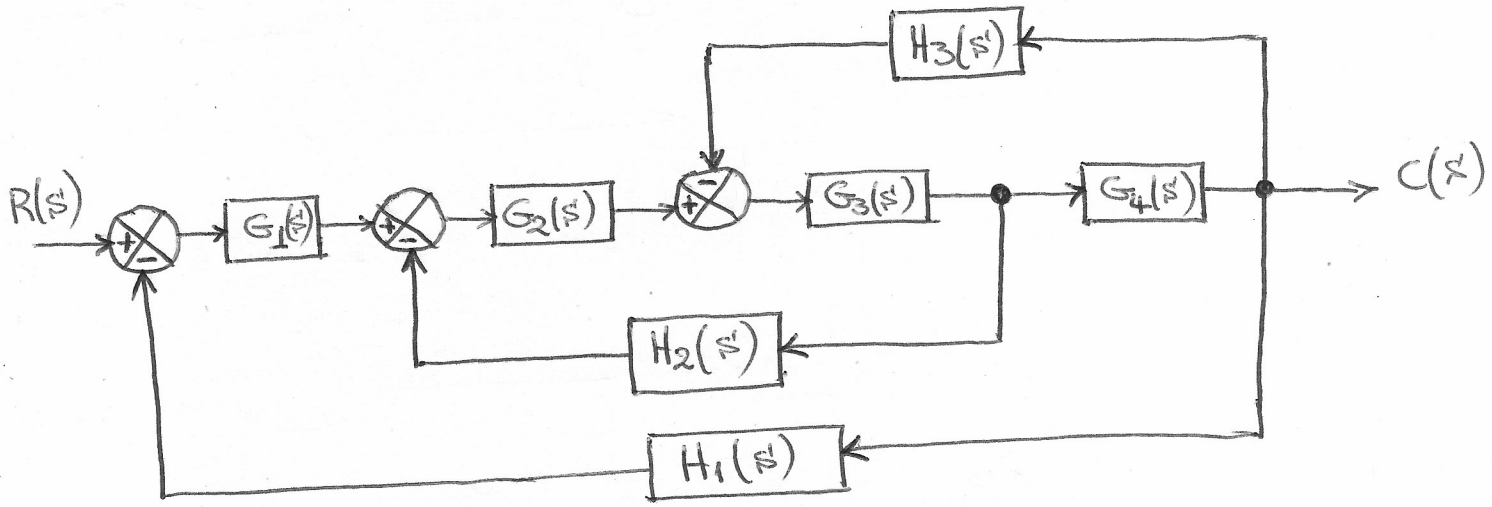
ΛΥΣΗ.



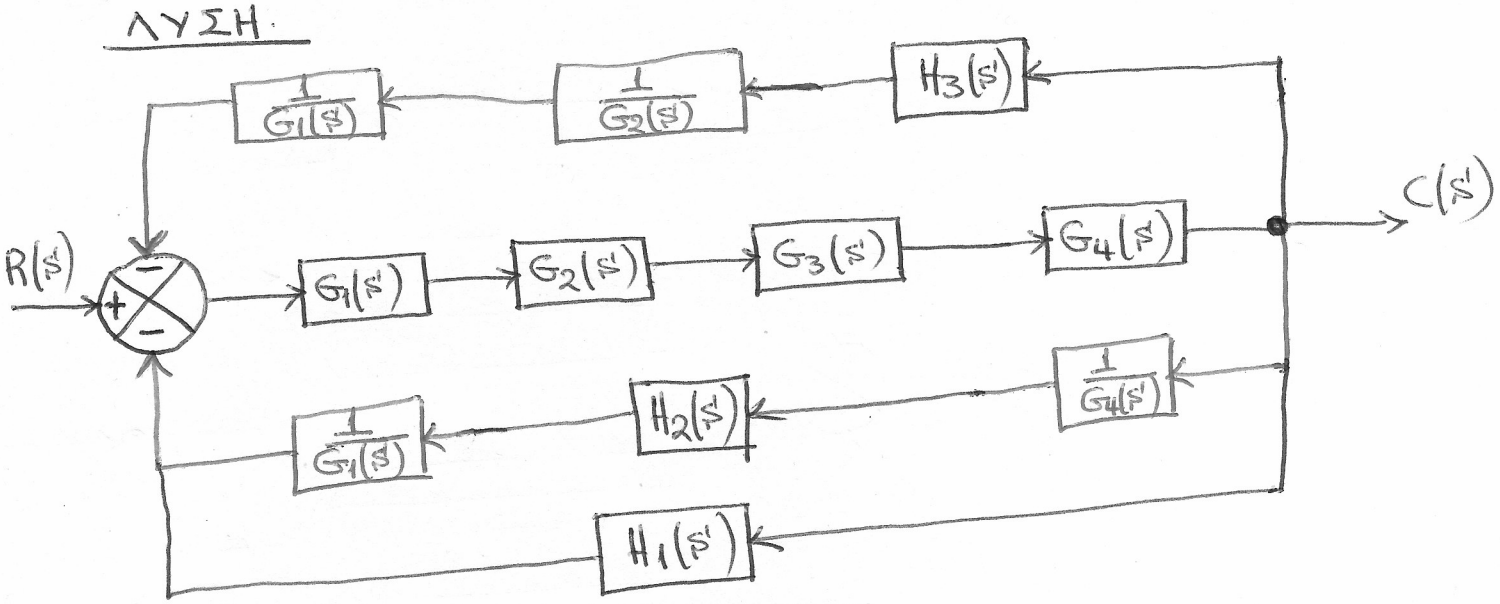


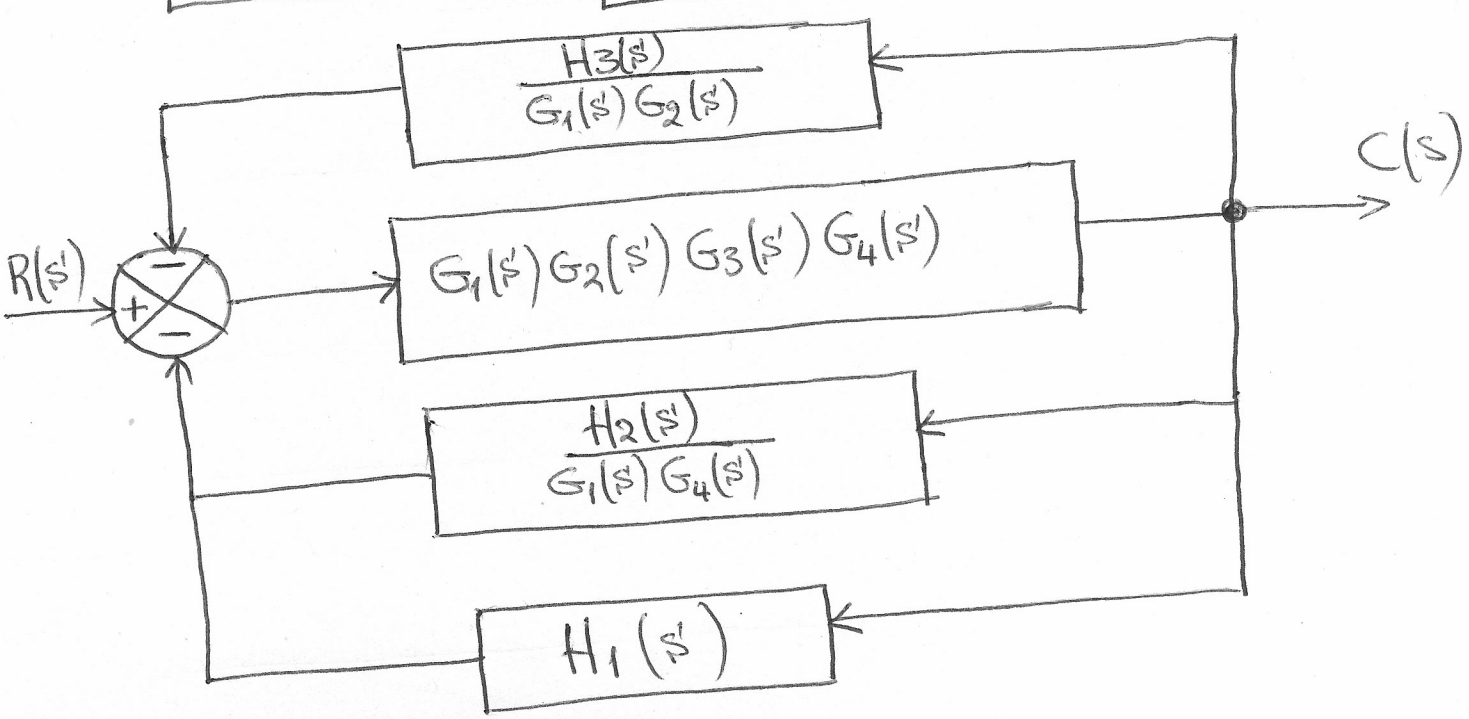


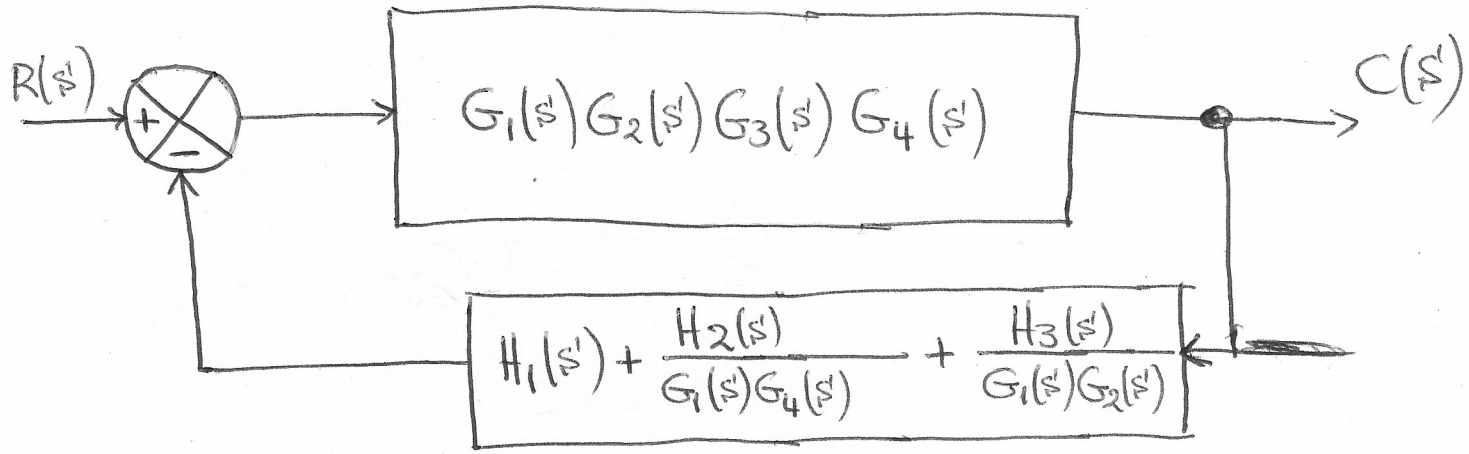
Να απλοποιηθεί το σύστημα ελέγχου και να βρεθεί η συνάρτηση μεταφοράς του.

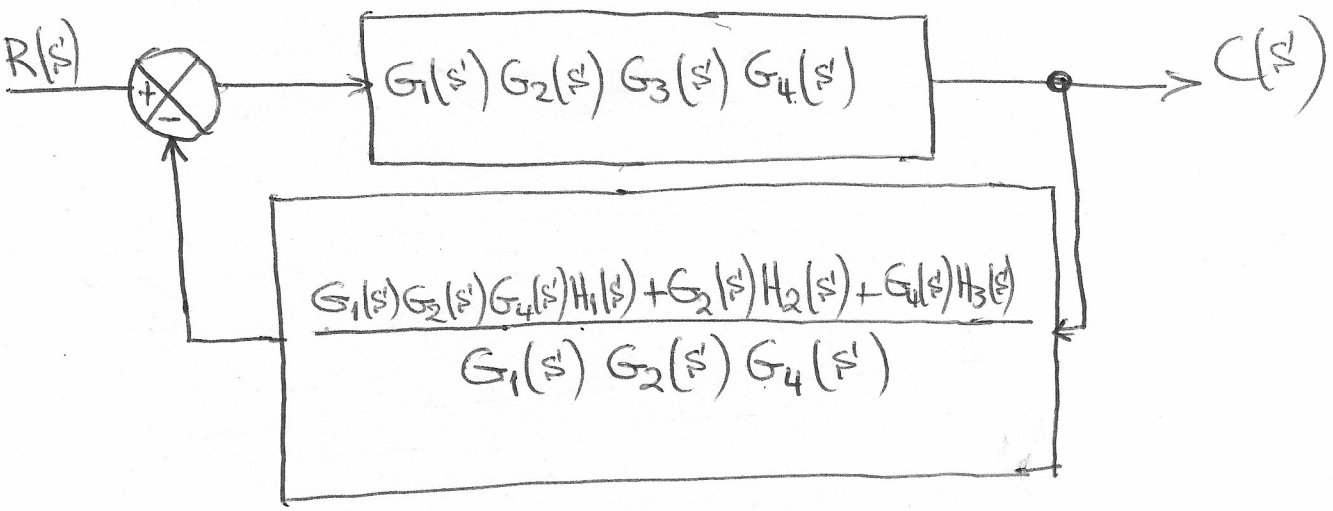


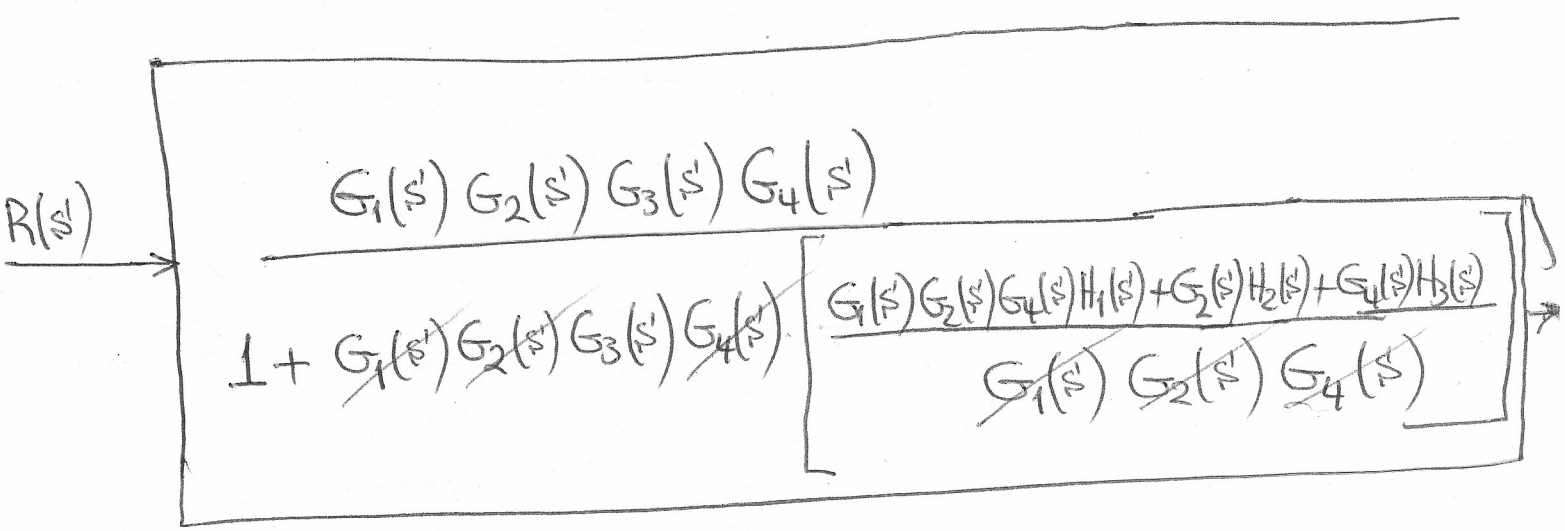
ΛΥΣΗ

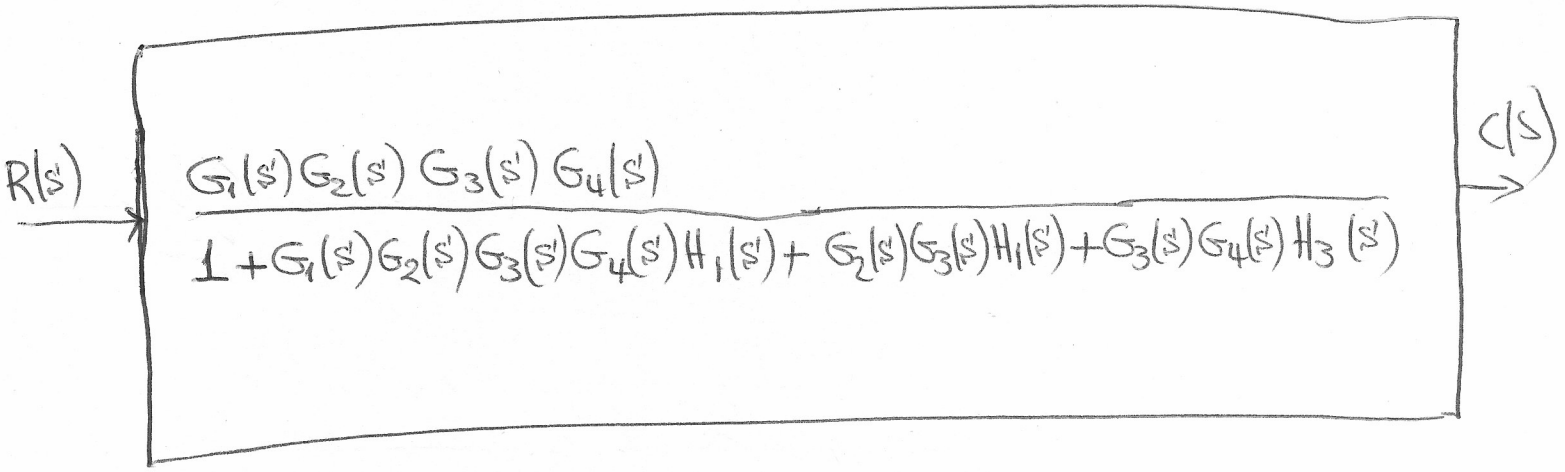





R(s)
+
−
G1(s) G2(s) G3(s) G4(s)
C(s)
H1(s) + H2(s) / G1(s)G4(s) + H3(s) / G1(s)G2(s)


R(s)
+
−
G1(s) G2(s) G3(s) G4(s)
C(s)
G1(s)G2(s)G4(s)H1(s) + G2(s)H2(s) + G4(s)H3(s) / G1(s) G2(s) G4(s)


R(s)
G1(s) G2(s) G3(s) G4(s) / 1 + G1(s) G2(s) G3(s) G4(s) [G1(s)G2(s)G4(s)H1(s) + G2(s)H2(s) + G4(s)H3(s) / G1(s) G2(s) G4(s)]



APA.

$$F(s)=\frac{C(s)}{R(s)}=\frac{G_1(s)\,G_2(s)\,G_3(s)\,G_4(s)}{1+G_1(s)G_2(s)G_3(s)G_4(s)H_1(s)+G_2(s)G_3(s)H_1(s)+G_3(s)G_4(s)H_3(s)}$$