(1) Textbook problem 4.13

(2) Textbook problem 4.28.

(3) Is a type K system w.r.t to input must also of type K w.r.t disturbance? Is a type K system w.r.t to disturbance must also of type K w.r.t input? Consider the following block diagram, under what condition (on C(s) and G(s)), both statements are true?

(4.a) The following figure shows a PI^2D controller. What is the type of the system w.r.t input and w.r.t disturbance?

(4.b) Let kp=100, what is the range of ki in which the system is stable?

(4.c) Use Simulink to demonstrate the tracking behavior of the system for the type of the system. Use a value of you choice for ki so that the tracking error converges quickly.

(5) We know that higher order integrators in the loop increases the system. What benefit, if any, does higher order differentiator in the loop have to offer? Use the following system as an example.