Design of a PID Controller

## 1. Objective

The design a PID controller of a closed loop system.

2. Exercise

Consider the system shown in Figure 1. We want to find all combinations of K and a values such that the closed-loop system has a maximum overshoot of less than 15%, but more than 10%, in the unit-step response. In addition, the settling time should be less than 3 sec. In this problem, assume that the search region is $2 \leq K \leq 10$ and $0.1 \leq a \leq 3$.

Determine the best choice of the parameters K and a.
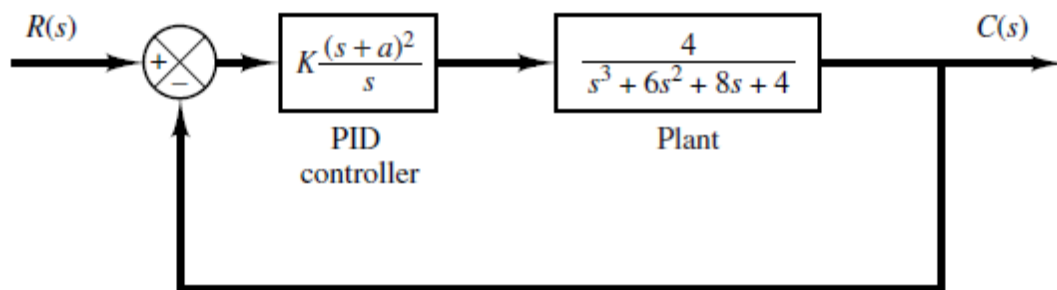
3. References

Katsuhiko Ogata, Modern Control Engineering, Fifth Edition, Pearson Education, 2017.