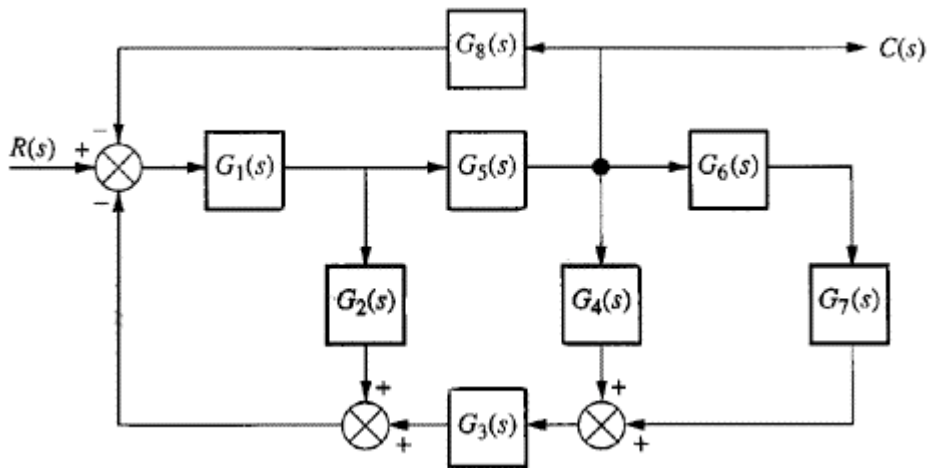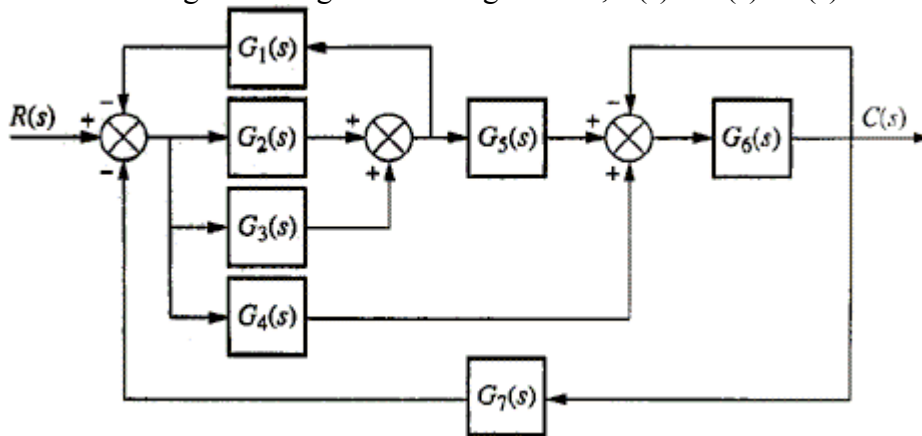# ECE311S Dynamic Systems and Control
# Problem Set 5

**Problems:**

Block Diagrams

1. Reduce the following bock diagram to a single block, T(s) = C(s) / R(s).
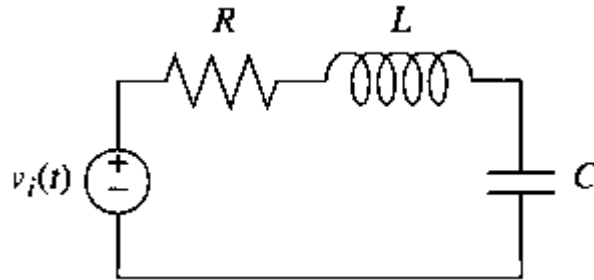


2. Reduce the following bock diagram to a single block, T(s) = C(s) / R(s).

3. Find the transfer function of a second-order system that yields a 12.3% overshoot and a settling time of 1 second.

4. Given the circuit:



where $C = 10$ μF, find $R$ and $L$ to yield 15% overshoot with a settling time of 2 ms for the capacitor voltage. The input, $v(t)$ is a unit step.