Chapter 11
1. Given a plant to control and transient and steady-state error performance specifications, determine the type of compensator (lag, lead, or lag-lead) required. You may need to find the desired Phase and Gain Margins from the performance specifications given $\zeta, \omega_n, %OS$, or closed-loop bandwidth. Increase the system Type if necessary by cascading the appropriate number of $1/s$ terms.
2. Given a plant, the type of compensator to use (lag, lead, or lag-lead) and performance specifications, complete the design by finding $K$ and the time-constants of the compensator.

Three or four cycle semilog paper will be attached to the exam.

Chapter 12
1. Given a transfer function or state-space representation of a system, determine if it the system is observable and controllable.
2. Given a transfer function or state-space representation of a plant and the desired closed-loop poles, find the state-feedback gain, $K$. Verify that the closed-loop system poles are the desired ones by finding the eigenvalues of the closed-loop system using its system matrix, $A$.

Chapter 13 Digital Control
1. Given a continuous time control system in block diagram form that may have an $H(s)$:

   - Convert the analog control system to a digital control system using pole-zero matching and the bilinear transform for poles and zeros that are 0.
   - Select the sample interval, $T$.
   - Draw a dotted line on the block diagram around the section on the block diagram that is to become the digital control part.
   - Find all discrete equations.

HOMEWORK PROBLEMS FOR CHAPTERS 11, 12, & 13