

24-352 DYNAMIC SYSTEMS & CONTROL

HOMEWORK ASSIGNMENT #11

DUE 4/11/01

PROBLEMS

From the textbook

13.3, 13.4, 13.6, 13.24, 13.25, 13.33

EXTRA CREDIT

Condition 1: Consider the DC motor diagram of Figure 10.13. Suppose $R_A = L_A = J = \alpha = 1$ and $B = 0$. In addition $e_i(t) = 100H(t)$ and $\tau_L = 0$.

- a. Find and plot the response of the motor.
- b. What value of R_A would result in a 5% overshoot?
- c. Suppose that condition 1 was applied and the motor reached a steady-state speed. Then a torque loading of $\tau_L(t) = 20$ where applied to the shaft. What would be the new steady-state speed of the shaft?