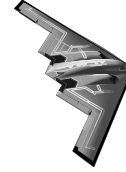
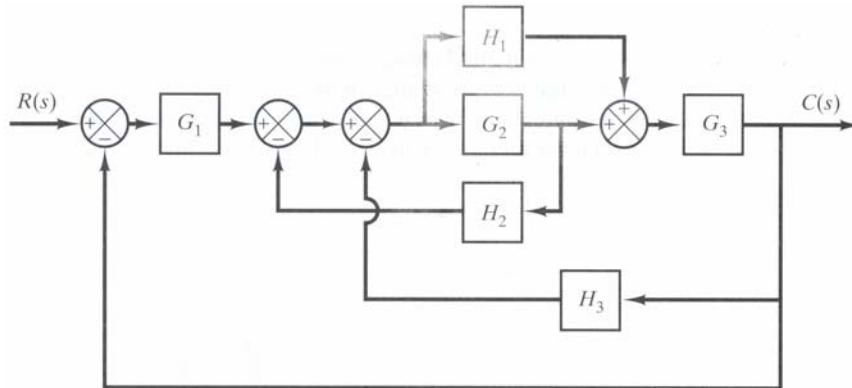


**ECEN/MAE 3723 Systems I  
Fall 2006**

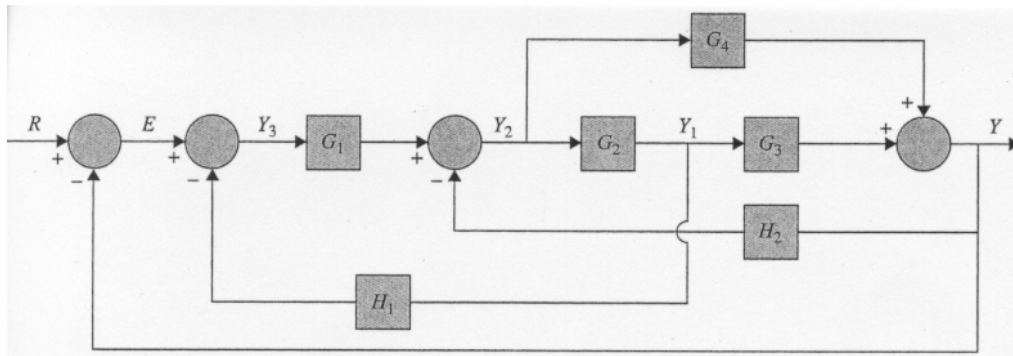


**Homework Assignment #8**

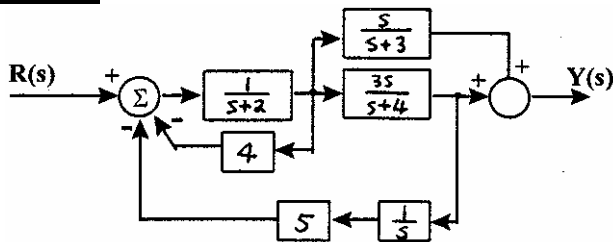
**Problem 1:** Simplify the block diagram shown below and obtain the closed-loop transfer function  $\frac{C(s)}{R(s)}$ .



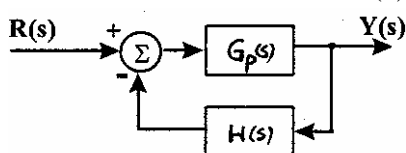
**Problem 2:** Find the closed-loop transfer function of the system shown below,  $\frac{Y(s)}{R(s)}$ .



**Problem 3:**

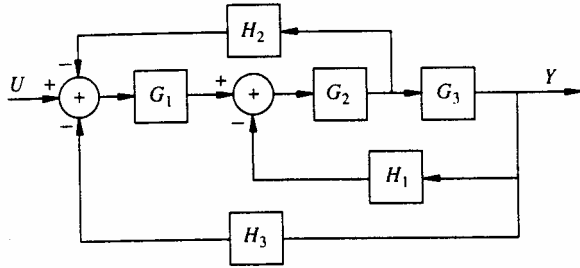


Use block diagram reduction to rearrange the above block diagram into the form shown below and find its transfer function,  $\frac{Y(s)}{R(s)}$ .



**Problem 4:** For the plant shown below prove that transfer function is

$$\frac{Y(s)}{U(s)} = \frac{G_1 G_2 G_3}{H_1 G_2 G_3 + H_3 G_1 G_2 G_3 + G_1 G_2 H_2 + 1}$$



**Problem 5:** Apply the gain formula to the SFG's shown below to find the transfer function

$$\frac{Y_5}{Y_1}, \text{ and } \frac{Y_4}{Y_1}.$$

