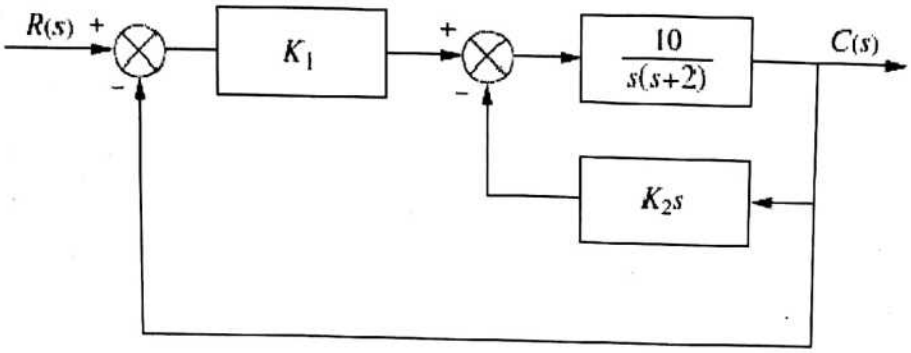
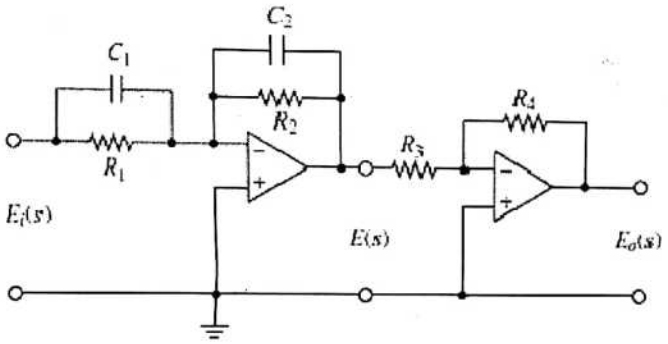
1. Find the values of K_1 and K_2 required to yield a peak time of 1.5 second and a settling time of 3.2 seconds for the closed-loop system's step response. Assume $T_s = 4/\zeta\omega_n$.



2. Find the transfer function $E_o(s)/E_i(s)$ for the op amp based circuit shown.



3. Consider the pneumatic controller shown in the figure. What control action does this controller produce? Assume that the pneumatic relay has the characteristics $p_c = Kp_b$, where $K>0$.