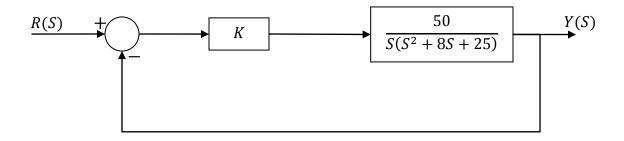
Faculty of Engineering, Cairo University Electronics and Communication Department Third Year, Spring 2011 Continuous-Time Control Systems (ELC327)

Quiz 1

Consider the system shown in the figure.



- a) Draw the bode plot of the **open loop** transfer function for K = 1. (1 point)
- b) Use the bode plot in part (a) to determine ω_{gc} , ω_{pc} , GM, and PM. (2 points)
- c) Find the value of K that results in a GM = 20dB. (1 point)
- d) Find the condition on K to have a $PM \ge 45^{\circ}$. (2 points)
- e) Find the value of *K* that makes the second order dominant poles of the closed loop system, have a settling time = 4 seconds. (2 points)
- f) For the value of *K* obtained in part (e), find the value of the steady state error for a unit ramp input, and the value of the maximum overshoot. (2 points)