

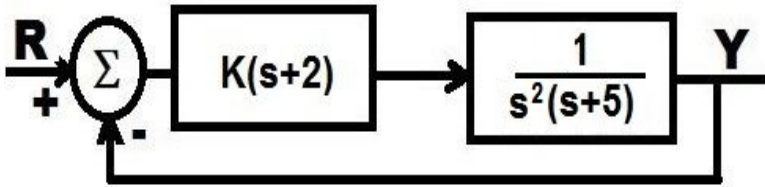
Name:
ID. No.

Eskişehir Osmangazi University - Electrical Engineering Department
Fundamentals of Control Systems
Final Examination - Spring 2014

All answers must be written in the appropriate neighborhoods of the questions. Anything written elsewhere will not be graded. Use the back side of the exam sheet if you need scratch paper.

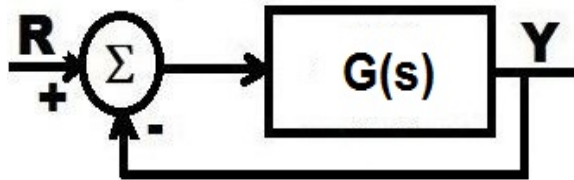
Question 1.

- 30 pts. (a) Sketch the root loci for the configuration below. Show trajectory directions by arrows.
(b) Is this system stable for $K = 5$?
(c) Find K value corresponding to the closed loop pole $s = -3$.



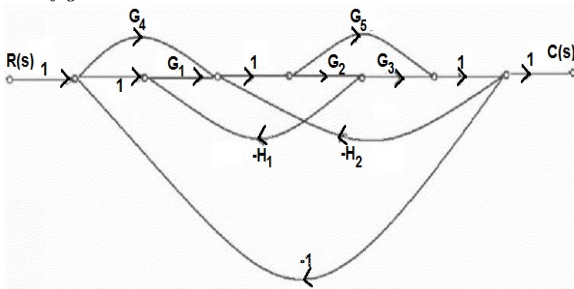
Question 2.

- 30 pts. (a) Let $G(s) = \frac{s+1}{(s+2)(s+5)}$. Sketch the Nyquist plot for the configuration below.
(b) How many times is the $(-1,0)$ encircled in the $G(s)$ plane?
(c) Is this system stable?



Question 3.

- 20 pts. Find the transfer function $\frac{C(s)}{R(s)}$ for the configuration below



Question 4.

20 pts.

$$y(n+2) = 0.2y(n) + u(n)$$

- (a) Find the transfer function $\frac{Y(z)}{U(z)}$.
(b) Is this system stable?

Good Luck
A. Karamancioğlu