Question 1: A Unity feedback system has:

1. if
2. Find the minimum value of K for

Question 2: The open loop transfer function of a servo system with unity feedback is

Evaluate the static error coefficient for the system. Obtain the steady-state error of the system when subjected to an input given by the polynomial

the dynamic error using the dynamic error coefficients.

Question 3: Using the Routh criterion, check whether the system represented by the following characteristic equation is stable or not. Comment on the location of the roots.

Question 4: A unity feedback control system is characterized by open loop transfer function

Using Routh Criterion

1. Calculate the range of values of K for the system to be stable.
2. What is value of K for marginal stability?
3. Check if for K=1, all the roots of characteristic equation of the above system have the damping factor greater than 0.5.

Question 5: Draw the complete root locus for

From the root locus, find the range of value of K for which the system will have damped oscillatory response. Also, determine the value of K for a damping ratio of 0.5. With this value of K, find the closed-loop transfer function.

Question 6: Draw the complete root locus for

Find the range of value of K for the system to be overdamped, critically damped, underdamped.

Question 7: Draw the complete root locus for

Question 8: Sketch the polar plots of transfer functions given below. Determine whether these plots cross the real axis.

Question 9: Sketch the Nyquist plot and comment on the stability of the closed-loop system whose open-loop transfer function is

Question 10: Sketch the Nyquist plot and comment on the stability of the closed-loop system whose open-loop transfer function is