Name: _____ ID: _____

1.) (10 pts) Please consider the system described by the open-loop transfer function:

$$G(s) = \frac{s-2}{(s+1)(s^2+6s+24)}$$

If this system is controlled by a proportional feedback controller with gain *K*, determine the range of *K* for stability of the closed loop system.

Name: _____ ID: _____

2.) (30 pts) For each of the unity-feedback control systems whose open-loop transfer functions are given below, please (a) Determine if the system is stable; (b) Determine the steady-state error of the system for unit step, and unit ramp inputs.

System 1: $G(s) = \frac{1}{s(s+1)(s+3)}$

System 2: $G(s) = \frac{s+5}{s^2-7s+12}$

Name: _____ ID: _____

3.) (30 pts) Please solve Problem B-5-13 from Ogata (page 266) (Please solve this problem analytically whenever possible and use MATLAB if not).

Assigned: 2/25/2021
Due: 3/4/2021 @ 11:59 pm

Name: _____ ID: _____

4.) (10 pts) Please solve Problem B-5-15 from Ogata (page 267). (You are free to use MATLAB or analytical calculations to solve this problem)