Complex Engineering Problem:

Objective:

To analyze the stability of spring mass damper system by various stability techniques and asses the reduction in settling time by using the Proportionate (P), integrate(I) and proportionate and integral (PI) controller.

Statement:

Consider a spring mass damper system shown in fig.01.

A. Using MATLAB develop the transfer function of the spring mass damper system
B. By using various stability techniques propose the best suited technique for the evaluation of stability for spring mass damper system.
C. Apply Proportionate (P), integrate(I) and proportionate and integral (PI) controller for reducing the rise and settling time of the system.
D. Your developed controller should not be greater than 5% of the settling time.
E. You need to answer the following statements
   a. Which technique is the best suited for calculating the stability of the system and why? Justify your answer
   b. Which control technique is most effective in reducing the rise time? Compare the responses of every controller.
   c. Why the overshoot is increasing while applying Proportionate (P) controller as compared to integrate(I) controller
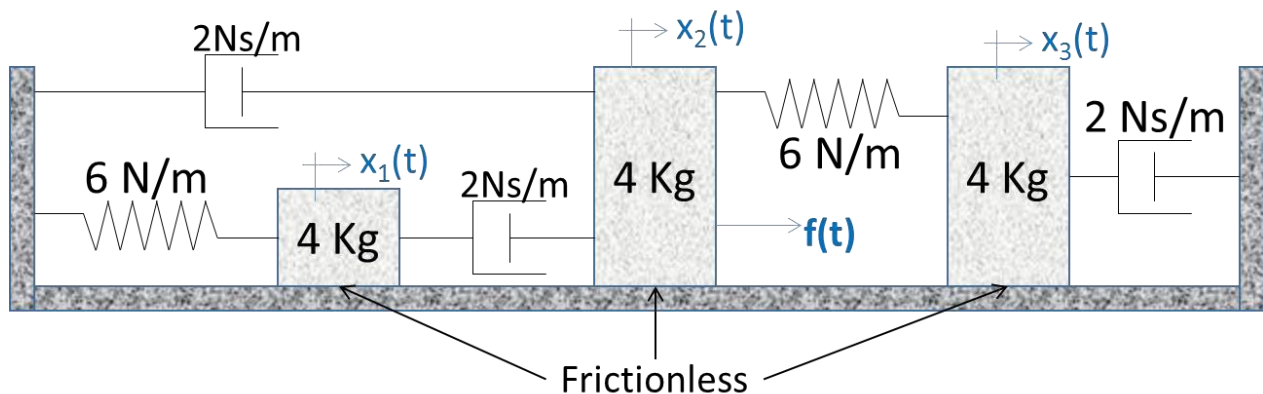

Fig.01

Course Title	Course Code	Knowledge Area (Wk)	PLO	WP
Control Engineering	EE-324	WK3,Wk4	5 (Modern Tool Usage)	WP1,WP2,WP3,WP4