Assignment of EEE 4105, Spring 22 Marks:40

You are required to design a practical automated control-system (electrical/mechanical/electro-mechanical) that needs to be designed step by step and verified with a modern simulation tool (where required).

i) **What is the system? Provide a brief description about it. Why have you chosen it? [Not more than 100 words] [2]**

ii) **Design the block model of your system. Reduce it to obtain the transfer function. Test both the system (large block model & reduced one) in simulation platform. Both should produce same output. [5]**

iii) **Draw the SFG of the system. Solve it to produce the transfer function. [5]**

iv) **Design the state space model of the system (state equation and output). [3]**

v) **Comment on the stability of the system via R-H criterion. [5]**

vi) **Illustrate the root-locus of the system manually. Verify your results using simulation tools. [6]**

vii) **Design a compensator which allows the original system to be updated or become error free. Verify your results using simulation tools. [10]**

viii) **Justify the choice of your compensator in terms of environmental impact. [Not more than 100 words] [4]**

**N.B The assignment should be unique. Your system should not match with any other people of your section. Verify it from the shared google sheet.

**practical automated control-system means it can be any automated system that can be found in real world and is a closed loop system. For eg.: AC, automated light, Fan, Motor etc.