



SANTHIRAM ENGINEERING COLLEGE, NANDYAL

Department of Electrical and Electronics Engineering

Name of the Laboratory: CONTROL SYSTEMS AND SIMULATION

Regulation: R15

Branch: *Electrical and Electronics Engineering*

Year & Sem: II- II

Course Objectives

- The effects of feedback on system performance
- Determination of transfer functions of DC Machine.
- The design of controllers/compensators to achieve desired specifications.
- The characteristics of servo mechanisms used in automatic control applications.

Course Outcomes

- Design the controllers/compensators to achieve desired specifications.
- Understand the effect of location of poles and zeros on transient and steady state behavior of systems.
- Assess the performance, in terms of time domain specifications, of first and second order systems.
- Use MATLAB/SIMULINK software for control system analysis and design.

List of Experiments

Any Eight of the following experiments are to be conducted:

1. Time Response of Second Order System
2. Characteristics of Synchros
3. Programmable Logic Controller
4. Effect of Feedback on DC Servo Motor
5. Transfer Function of DC Machine
6. Effect of P, PD, PI, PID Controller on a Second Order System.
7. Lag and Lead Compensation – Magnitude and Phase Plot
8. Temperature Controller Using PID
9. Characteristics of Magnetic Amplifiers
10. Characteristics of AC Servo Motor

Any two simulation experiments are to be conducted:

1. PSPICE Simulation of Op-Amp Based Integrator and Differentiator Circuits.
2. Linear System Analysis (Time Domain Analysis, Error Analysis) Using MATLAB.
3. Stability Analysis (Bode, Root Locus, Nyquist) of Linear Time Invariant System Using MATLAB
4. State Space Model for Classical Transfer Function Using MATLAB – Verification.

List of Equipments

1. AC Servo Speed Torque Characteristics
2. Magnetic Amplifier
3. PID Simulator
4. Linear System simulator
5. DC Servo Motor Speed Torque Characteristics
6. Synchro Transmitter And Receiver pair
7. DC Motor Speed Controller Using PID Controller
8. Transfer Function Of DC Motor
9. Programmable Logic Control (PLC) Trainer Kit
10. Speed Torque Characteristics of AC Servo Motor
11. Speed Control Of DC Motor
12. PID Controller Kit
13. Computer with MATLAB Software



Lab Instructor:

Mr. S. Seetharamudu,
Asst. Professor,
Dept. of EEE,
SREC.



Lab Assistant:

Mr. S. Shahinsha,
Dept. of EEE,
SREC.