



## CONTROL SYSTEMS LAB

### Objectives:

- To impart hands on experience to understand the performance of basic control system components such as magnetic amplifiers, D.C. servo motors, A.C. Servo motors, stepper motor and potentiometer
- To understand time and frequency responses of control system with and without controllers and compensators

### Course Outcomes:

Upon completion of this course, students will acquire

- CO1 Ability to examine the characteristics of various control system components
- CO2 Ability to interpret the effects of P, PI, PID controllers
- CO3 Ability to verify compensator characteristics and logic gates function through PLC
- CO4 Ability to analyse the response of a second order system

### LIST OF EXPERIMENTS

- 1 Time response of Second order system
- 2 Characteristics of Synchros
- 3 Programmable logic controller – Realization of logic gates
- 4 Effect of feedback on DC servo motor
- 5 Effect of P, PD, PI, PID Controller on a second order systems
- 6 Transfer function of DC motor
- 7 Temperature controller using PID
- 8 Characteristics of magnetic amplifiers
- 9 Characteristics of AC servo motor
- 10 Characteristics of DC servo motor

### Additional Experiments

- 1 Transfer function of DC generator
- 2 State space model from transfer function model using MATLAB

### List of Equipment Cost

S. No.	Item Description	Quantity	Cost (Rs.)
1.	Time response of second order system	1	5,525.00
2.	D.C servo motor controller	1	28,580.00
3.	PID Controller Module	1	22,150.00
4.	Lag-Lead Compensation module	1	8,190.00
5.	Temperature controller using PID	1	23,961.00
6.	A.C servo motor module	1	10,920.00
7.	Magnetic amplifier	1	14,476.00
8.	PLC trainer kit	1	46,000.00
9.	Synchro Transmitter and Receiver pair	1	10,150.00
10.	CROs	4	48,080.00
11.	Dual Channel DSO	1	30,450.00
12.	Function Generator (1MHz)	2	3,245.00
13.	Regulated Power supply	1	2,860.00
14.	Rheostats	2	1,500.00
15.	Voltmeter	1	1,035.00
16.	Ammeters	2	2,070.00
<b>Total</b>			<b>2,59,192.00</b>