MECHATRONICS LAB

Course Code	20SA8753	Year	IV	Semester	I
Course Category	Skill Advanced course	Branch	ME	Course Type	Lab
Credits	1.5	L – T – P	0 – 0 – 3	Prerequisites:	Nil
Continuous Internal Evaluation	-	Semester End Evaluation	50	Total Marks	50

Course Outcomes: Upon successful completion of the course, the student will be able to

	Statement	Skill	BTL	Expts
CO1	Build pneumatic and electro pneumatic circuits for various mechanical applications.	Apply	L3	1-8
CO2	Demonstrate the features of simulation software.	Apply	L3	9-12
CO3	Apply the knowledge of MATLAB software to check the truth tables of logic gates.	Apply	L3	13
CO4	Demonstrate the behavior of sensors.	Apply	L3	14
CO5	Develop Ladder (PLC) programs for given application	Apply	L3	15

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:High, 2: Medium, 1:Low)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3		2						3	2		1	3	1
CO2	3		2						3	2		1	3	1
CO3	3		2						3	2		1	3	1
CO4	3		2						3	2		1	3	1
CO5	3		2						3	2		1	3	1

Note: Twelve experiments must be conducted

LIST OF EXPERIMENTS

Syllabus		
Exp. No.	**Content**	**Mapped CO**
PNEUMATICS		
1.	Direct control of single and double acting cylinders	**CO1**
2.	Indirect control of single and double acting cylinders	
3.	Single cycle operation of double acting cylinder	
4.	Multi cycle operation of double acting cylinder	
ELECTRO PNEUMATICS		
5.	Direct control of a double acting cylinder using a solenoid valve	
6.	Indirect control of a double acting cylinder using a solenoid valve and relays	
7.	Operation of double acting cylinder with AND & OR logic circuit using relays	
8.	Single cycle operation of a double acting cylinder using electrical limit switches and relays	
AUTOMATION STUDIO SOFTWARE		
9.	Modeling and simulation of single and double acting cylinder (Direct	**CO2**

	control)	
10.	Modeling and simulation of single and double acting cylinder (Indirect control)	
11.	Modeling and simulation of single cycle operation of a double acting cylinder using limit switch	
12.	Modeling and simulation of multi cycle operation of a double acting cylinder using limit	
MATLAB PROGRAMMING		
13.	Simple MATLAB Programmes to verify truth tables of a) NOT b) AND c) NAND d) OR e) NOR f) XOR g) XNOR logic gate	**CO3**
BEHAVIOUR OF SENSORS		
14.	A) Behavior of Inductive sensor NJ B) Behavior of Capacitive sensor CJ C) Behavior of Magnetic sensor MJ D) Behavior of Ultrasonic sensor E) Behavior of Through beam sensors F) Behavior of Reflex photoelectric sensor OBS G) Behavior of Direct detection sensors OJ	**CO4**
PLC PROGRAMMING (LADDER PROGRAMMING)		
15.	A) PLC program to implement various logic gates B) PLC Program to Operate 4 Outputs Simultaneously with Time Delay C) PLC Program to do Mathematical Functions D) PLC Program to Control Traffic Lights.	**CO5**