Hall Ticket Number:

Code No. : 17335 S

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade

B.E. (E.E.E.) VII-Semester Supplementary Examinations, July-2022

Programmable Logic Controllers (PE-IV)

Time: **3 hours**   Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Compare PLC technology with relay control technology.	2	4	1	1,2
2.	List the types of memories available in the PLC-CPU.	2	1	1	1,2
3.	A conveyor motor should run when any of the input buttons 1,2,3,4 is pressed, the motor should not stop when the button is released. The conveyor motor should stop if any of the buttons 11,12,13,14 is pressed. Draw the logic gate, ladder diagram for the same.	2	4	2	1,2,5
4.	Draw a ladder diagram for the given logic gate diagram.	2	4	2	1,2,5
5.	Explain the five level hierarchy of addressing module for O2:31/12.	2	2	3	1,2
6.	Convert the binary value of "10101010" to Gray code, convert gray code of 10111101 to binary code.	2	4	3	1,2
7.	Explain about BIT SET, and BIT FALLOW.	2	2	4	1,2
8.	How the SKIP function is used in a ladder logic for the data handling?	2	1	4	1,2
9.	Draw the block diagram of PID controller.	2	4	5	1,2
10.	Draw the functional block of a PID controller in the PLC system.	2	4	5	1,2

Part-B (5 × 8 = 40 Marks)

11. a)	Explain the function of each block of the PLC system with a neat block diagram.	4	2	1	1,2
b)	With a neat schematic diagram explain about the input/output modules interfacing to the PLC.	4	2	1	1,2
12. a)	Draw and explain ladder logic program, power diagram of 3-phase induction motor control with PLC for i)forward –stop- reverse ii) forward – reverse direction with mutual interlocks.	4	4	2	1,2,5
b)	Draw the ladder diagrams and truth tables for the 7 basic types of logic gates.	4	4	2	1,2,5

			M	L	CO	PO
13.	a)	Implement the basic types of arithmetic functions using PLC ladder Logic.	4	2	3	1,2,5
	b)	Draw the flow chart and ladder logic diagram for the paint spray process control system.	4	4	3	1,2,5
14.	a)	Explain about the following functions i) Shift Left ii) Shift Right iii) Rotate Left iv) Rotate Right	4	2	4	1,2
	b)	Explain basic Two-axis Robot model with PLC sequencer control.	4	2	4	1,2,5
15.	a)	With a neat diagram explain the process control curves with different PID tunings.	4	2	5	1,2
	b)	How the 8-bit PLC CPU takes the signal from 0-300 V, potentiometer reading of 200V draw appropriate conversion diagram, i/p terminal supports up to 5V.	4	1	5	1,2
16.	a)	List and explain any 5 merits and 2 demerits of the PLC system.	4	1	1	1,2
	b)	Develop the logic gate diagram for the given Ladder logic and also explain the process of it.	4	4	2	1,2,5

			M	L	CO	PO
17.		Answer any *two* of the following:				
	a)	Draw the suitable timing diagram and ladder logic program for the i) ON-Delay ii) OFF Delay iii) Limited ON time iv) Repeat Cycling	4	4	3	1,2,5
	b)	With a neat sketch explain about the JUMP function for data handling.	4	2	4	1,2
	c)	List and Describe the tuning methods of PID control implemented using PLC ladder logic.	4	1	5	1,2

M : Marks;   L: Bloom's Taxonomy Level;   CO; Course Outcome;   PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	40%

*****