Hall Ticket Number:

Code No. : 17345 S N/O

VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD

Accredited by NAAC with A++ Grade

B.E. (E.E.E.) VII-Semester Supplementary Examinations, May/June-2023

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.	Define PLC. What is the original name of PLC?	2	1	1	1,2,3
2.	Draw the symbols for contacts & coils. Hence bring out the concept of Ladder diagrams.	2	3	1	1,2,3
3.	Draw the standard start-stop shield circuit for the motor start stop.	2	3	2	1,2,3,5
4.	Differentiate between a PLC connection diagram and ladder diagram.	2	2	2	1,2,3
5.	Limit switches play a very important role in the development of PLC systems. Justify.	2	2	3	1,2,3
6.	Differentiate between input registers and output registers in a PLC	2	2	3	1,2,3
7.	What are the advantages of JUMP instruction?	2	1	4	1,2,3
8.	Explain FIFO function.	2	2	4	1,2,3
9.	What exactly do you mean by Analog PLC operation?.	2	2	5	1,2,3
10.	With the help of an example explain the PLC Analog operation.	2	4	5	1,2,3
	Part-B (5 × 8 = 40 Marks)				
11. a)	With a neat block diagram explain about the PLC.	4	3	1	1,2,3
b)	With the help of neat figures explain devices connected to I/O Modules in a PLC.	4	1	1	1,2,3
12. a)	List and implement the basic types of logic gates ladder diagram and also write the truth table.	4	1	2	1,2,3
b)	Explain the Drill Press operation & its sequence of operations. Also draw the Ladder diagram	4	3	2	1,2,3,5
13. a)	Distinguish between 'input group register scheme' & 'input single register scheme'	4	2	3	1,2,3
b)	Design and construct a PLC circuit for the following process: A fan **F** is to be turned on when count **L** goes from 7 down to 0and when either count **M** goes up to 14 or count **N** has not gone all the way from 14 down to 0. One switch or stop button resets the entire process.	4	3	3	1,2,3,5

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14. a)	Differentiate between the PLC functions FAL, ONS and SWEEP functions. Give an example for any one of them.	4	4	4	1,2,3
b)	With the help of a neat figure analyze the working of a MATRIX function.	4	2	4	1,2,3
15. a)	Explain Multi Bit Data Processing with the help of an example.	4	2	5	1,2,3
b)	Two linear input of 0 to 4 volts are to be multiplied and the result put out on a linear output of 0 to 150 volts. Trace the numbers if the inputs are 2.85 & 3.45 Volts.	4	3	5	1,2,3,5
16. a)	List the advantages and applications of PLC.	4	3	1	1,2,3
b)	A process 'A' is to run only when the following conditions are met. i) Input 1 is OFF ii) Input 2 is ON or Input 3 is ON, or both 2 & 3 are ON iii) Inputs 5 & 6 are both ON iv) One or more inputs 7, 8 or 9 is ON Convert the above word description into a Ladder Diagram.	4	3	2	1,2,3,5
17.	Answer any ***two*** of the following:				
a)	Differentiate between "COUNT UP" and "COUNT DOWN" with the help of an example.	4	1	3	1,2,3
b)	Two axes ROBOT.	4	2	4	1,2,3,5
c)	PID Tuning	4	2	5	1,2,3

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

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	37.5%
iii)	Blooms Taxonomy Level – 3 & 4	42.5%

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