Register No.: .... Name: ....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FIFTH SEMESTER B.TECH. DEGREE EXAMINATION (R), DECEMBER 2023
ROBOTICS AND AUTOMATION

(2020 SCHEME)

Course Code: **20RBT391**

Course Name: **PLC and SCADA**

Max. Marks: **100**   **Duration: 3 Hours**

PART A
(Answer all questions. Each question carries 3 marks)

1. List IEC standards for control elements.
2. Give examples of digital and analog input/outputs.
3. Draw ladder diagram on XIO and XIC instruction.
4. Sketch latch concept using PLC ladder diagram.
5. Define Profibus-PA and Profibus FMS.
6. Explain the need for HMI in Industrial Automation.
7. Give the significance of alarm logging.
8. Outline the graphic display unit in SCADA.
9. Explain the requirement of operator interface in DCS.
10. List the parts of a local control unit with a block diagram.

PART B
(Answer one full question from each module, each question carries 14marks)

MODULE I

11. a) Explain electromagnetic control relay as I/O device.   (8)
    b) What are the selection criteria for selecting PLC?   (6)

OR

12. a) Illustrate the architecture of PLC with scan cycle.   (10)
    b) Describe the need of isolation in input/output module.   (4)

MODULE II

13. a) Draw ladder diagram for sequential hardware three motor relay control circuit.   (10)
    b) Write short note on functional block programming language.   (4)

OR

14. a) Enumerate timer on-delay and counter up operation with suitable diagram.   (10)
    b) Illustrate sequential flow chart.   (4)

MODULE III

15. a) Illustrate different methods of interfacing HMI with PLC. (7)
    b) Write short note on types of network topologies. (7)

OR

16. a) Construct PLC ladder diagram on traffic light system. (7)
    b) Explain screen development and navigation in HMI. (7)

MODULE IV

17. a) Describe the water level control process in PLC with basic block diagram. (7)
    b) Enumerate (a) Tag logging (b) Report generation. (7)

OR

18. a) Explain various functions of SCADA with block diagram. (7)
    b) Illustrate developer and run time packages in SCADA. (7)

MODULE V

19. a) Enumerate high level engineering interface. (6)
    b) Explain distributed control system with a neat block diagram. (8)

OR

20. a) Illustrate the interfacing of SCADA with PLC. (7)
    b) Describe DDE-server/client configuration. (7)

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