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

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FIFTH SEMESTER B.TECH DEGREE EXAMINATION (Regular), DECEMBER 2022

(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. Distinguish PLC and ordinary computer and also list out its significance in automation.
2. Define scan cycle of PLC.
3. Implement a ladder program which executes the expression
   $$a' b' c + a c' + a' c + a b.$$
4. Define any three arithmetic instructions in PLC with examples.
5. Define HMI systems and suggest its uses.
6. Explain CAN Open.
7. Explain graphic display unit in SCADA.
8. Describe alarm logging and explain its importance.
9. Define OLE for process control and also quote its importance in automation field.
10. Explain the parts of local control unit with a neat block diagram.

PART B

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

MODULE I

11. a) Define IEC/ISA Standards for Control Elements. (5)
    b) Explain the architecture of programmable logic controller with neat schematic. (5)
    c) Why modular PLC is most suitable in modern automation field? Explain (4)

OR

12. a) Explain different parts of PLC analog input module with neat sketch. (7)
    b) Describe the methods of communication of PLC with PC. (4)
    c) Explain the selection criteria of PLC for various applications. (3)

MODULE II

13. a) Illustrate the working of PLC controlled stepper motor using ladder logic. Also draw a flow chart to describe the operation. (7)

    b) With neat diagrams explain different types of timers used in PLC. (7)

OR

14. a) Design a PLC ladder program to control level of a tank. One open tank is installed in the plant of which liquid level is to be controlled. When level reaches the level flow, outlet flow is blocked and inlet flow is allowed until high level is achieved. When level high is detected, outlet flow is allowed and inlet flow is blocked. (7)

    b) Explain different types of counters used in PLC with neat schematic. (7)

MODULE III

15. a) Write a PLC ladder program to control traffic light system in one direction. (7)

    b) Explain different types of HMI system used in automation field. (7)

OR

16. a) Illustrate the interfacing of an analog sensor with PLC. (7)

    b) Explain the working of PROFIBUS with neat block diagram. (7)

MODULE IV

17. a) With neat block diagram explain the various functions of SCADA. (7)

    b) Sketch the basic blocks involved in a water level control process using PLC. (7)

OR

18. a) Elaborate on developer and runtime packages in SCADA. (7)

    b) Describe a) Tag logging b) Report generation (7)

MODULE V

19. a) Explain distributed control system with a neat block diagram. (8)

    b) Distinguish operator interface and engineering interface. (6)

OR

20. a) Illustrate the interfacing of SCADA with PLCs. (7)

    b) Describe a) DDE   b) Server/Client Configuration (7)

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