

Register No:

Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

EIGHTH SEMESTER B.TECH DEGREE EXAMINATION(R), MAY 2024**Robotics and Automation****(2020 SCHEME)****Course Code : 20RBT464****Course Name : Supervisory Control****Max. Marks : 100****Duration:3 Hours****PART A***(Answer all questions. Each question carries 3 marks)*

1. Define process control loop with an example.
2. Identify key factors to consider when selecting a computerized control system.
3. Explain analog instruction in the PLC programming with an example.
4. Define OPC.
5. How does SCADA software differ from PLC software?
6. Explain the importance of remote monitoring and control capabilities provided by RTUs.
7. Define SCADA master station.
8. Write the function of Local Control Unit in DCS.
9. Illustrate the significance of field control devices in automation field.
10. Define automation in the cloud.

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

11. Explain the function of analog input and output module in PLC with neat schematic. 14

OR

12. a) Describe the typical components of a PLC system with neat diagram. 10
b) How PLC is used for real time monitoring? 4

MODULE II

13. 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 Low, Outlet flow is blocked and inlet flow is allowed until high level is achieved. And when Level High is detected, outlet flow is allowed and inlet flow is blocked. 14

OR

14. a) How can we physically connect a PLC to a SCADA or DCS system? Explain with block diagram. 10
b) Differentiate between RS232 and RS485. 4

MODULE III

15. Describe the integration of HMI systems with SCADA and PLCs for centralized monitoring and control. 14

OR

16. With neat block diagram explain the function of direct digital control in automation industries. How does this capability enhance operational efficiency and flexibility? 14

MODULE IV

17. a) Explain in detail different process interfacing issues seen in DCS. 14

b) Give the main functions of communication facilities in a DCS system?

OR

18. With a neat block diagram explain the architecture of distributive control system. How does a hierarchical DCS architecture differ from a centralized one? 14

MODULE V

19. a) How do communication facilities enable interaction between the LCU and other components in SCADA system? 8

b) Define operator displays with examples. 6

OR

20. Explain the process of interfacing wired and non wired smart field device for communication with a DCS controller. 14
