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Question Paper Code: U3506

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2024

Professional Elective

Electrical and Electronics Engineering

21UEEV506 PLC AND SCADA APPLICATIONS

(Regulations 2021)

Duration: Three hours   Maximum: 100 Marks

Answer All Questions

PART A - (10 x 2 = 20 Marks)

1.	Define PLC and briefly explain its function in industrial automation	CO1- U
2.	How are on-off outputs programmed in PLCs	CO1- U
3.	Explain the function of skip and MCR functions in PLC programming	CO1- U
4.	Define a proximity sensor and explain its application in industrial settings	CO1- U
5.	Explain the role of SCADA in managing energy within a facility	CO1- U
6.	What is the purpose of a data acquisition system in SCADA.	CO1- U
7.	What are registers, and what is their significance in PLC programming.	CO1- U
8.	What is the function of a latch instruction in PLC programming.	CO1- U
9.	Give an example of a monitoring function performed by SCADA systems.	CO1- U
10.	How can SCADA systems help in making real-time decisions?	CO1- U

PART – B (5 x 16= 80 Marks)

11. (a) Elucidate the architecture of the PLC in detail   CO1- U   (16)

Or

(b) Discuss timer and counter functions in PLC programming, CO1- U (16) including their applications in controlling time-based and count-based processes respectively.

12. (a) Explain PLC trouble shooting, maintenance and Installation in CO1-U (16) detail.

Or

(b) Model a ladder diagram using up-counter and its function with CO1-U (16) example. Also explain the sequence of operation.

13. (a) Draw and explain SCADA architecture in detail. CO1- U (16)

(b) Design a SCADA server for any one application of your own CO1- U (16)
with communication networking.

14. (a) Develop a PLC Ladder network for Motor control logic. with CO2 -App (16)
proper explanations
(i) on delay timer (delay time of 5 sec)
(ii) off delay timer (delay time of 2 sec)

Or

(b) Develop a PLC program for Motor control in Ladder logic. CO2 App (16)

15. (a) Discuss the role of data acquisition systems in SCADA CO2- App (16)
environments, highlighting their importance in collecting real-
time data from sensors, meters, and control devices distributed
across industrial facilities or infrastructure networks.

Or

(b) Explain how data acquisition systems contribute to the CO2- App (16)
monitoring and control of critical parameters within industrial
processes or infrastructure systems, and discuss the challenges
associated with ensuring data integrity, accuracy, and reliability
in SCADA environments.