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Question Paper Code: U3506

B.E. / B.Tech. DEGREE EXAMINATION, APRIL / MAY 2025

Professional Elective

Electrical and Electronics Engineering

21EEV506 PLC AND SCADA APPLICATIONS

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (10 x 2 = 20 Marks)

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|---|--------|
| 1. Define PLC and briefly explain its function in industrial automation | CO1- U |
| 2. What are input modules in a PLC system, and what is their purpose? | CO1- U |
| 3. Describe an arithmetic function commonly used in PLC programming. | CO1- U |
| 4. What is the purpose of number comparison functions in PLC systems? | CO1- U |
| 5. Define SCADA and explain its basic function in industrial settings. | CO1- U |
| 6. What are two benefits of using a centralized SCADA architecture? | CO1- U |
| 7. How does the IEC 61850 standard impact SCADA/HMI systems? | CO1- U |
| 8. Describe in simple terms how automatic substation control works within a SCADA system. | CO1- U |
| 9. Describe the function of output modules in a PLC setup. | CO1- U |
| 10. What is the role of power supplies in a PLC system? | CO1- U |

PART – B (5 x 16= 80 Marks)

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| 11. (a) Develop a PLC Ladder network for Motor control logic. with proper explanations
(i) on delay timer (delay time of 5 sec)
(ii) off delay timer (delay time of 2 sec) | CO2- App (16) |
| Or | |
| (b) Develop a PLC Ladder network for UP and DOWN Counter.. | CO2- App (16) |
| 12. (a) Build a ladder diagram for any application using Sequencer instructions. | CO2- App (16) |

Or

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|-----|---|----------|------|
| | (b) Apply program control instructions and develop ladder diagram for production line. | CO2- App | (16) |
| 13. | (a) Draw and explain SCADA architecture in detail | CO1- U | (16) |
| | (b) Explain in detail about Remote Terminal Unit. | CO1- U | (16) |
| 14. | (a) Discuss the role of data acquisition systems in SCADA environments, highlighting their importance in collecting real-time data from sensors, meters, and control devices distributed across industrial facilities or infrastructure networks. | CO3- App | (16) |
| | Or | | |
| | (b) A manufacturing company is planning to upgrade its SCADA system. They are considering moving from a monolithic system to a networked system. What factors should they consider in selecting the right architecture, and how would this transition impact system security and scalability? | CO3- App | (16) |
| 15. | (a) Explain the Input and Output module of the PLC in detail. | CO1 - U | (16) |
| | Or | | |
| | (b) Explain ON and OFF-Delay timer with an example. | CO1 - U | (16) |