

Eighth Semester B. Tech. [ELECTRICAL] Degree Examination

(2013 Scheme- April/May 2017)

13.806.4 INDUSTRIAL AUTOMATION (E) (Elective V)

Time: 3Hours

Max. Marks: 100

- **Instruction:** Answer *all* questions from Part A. **One full** question from *each* Module of Part B.
PART A (Each carries 2 mark)

1. What is Automation? Give Examples ?
2. Compare Automated and Manual operated systems ?
3. Explain Discrete manufacturing Industries ?
4. Briefly explain Sequence Control ?
5. Compare PLC and PC ?
6. Briefly Explain SCADA systems ?
7. List the programming languages used for PLC along with suitable applications ?
8. What is distributed control system ?
9. Give any four advantages of DCS ?
10. Construct ladder logic diagram for NAND gate ?

PART B

MODULE 1

11. a. Explain in detail the architecture of an industrial automation system with suitable figures?
b. Explain different devices used in automation? (8)
- OR
12. Explain computer process and its forms (20)

MODULE 2

13. a. Explain the working of a PLC with suitable block diagram? Give applications of PLCs?
b. Explain SCADA software? (8)
- OR
14. a. Explain Relay Ladder Logic with example? (5)
b. Explain SCADA architectures monolithic, distributed and networked? (15)

MODULE 3

15. a. Explain DCS with suitable figures? Give the advantages and disadvantages of DCS? (15)
b. Explain interfacing of PLC with SCADA? (5)

OR

16. a. Explain in detail DCS communication Protocols? (10)
b. Briefly explain the DCS integration with PLC and Computer? (10)

MODULE 4

17. a. Construct truth table, logic diagram and ladder logic diagrams for (8)

1. NOR Gate
2. $Y=(X1+X2)X3$
3. $Y=(X1+X2)(X3+X4)$
4. $Y=(X1X2)+X3$
5. Push Button

- b. Explain Timers, Triggers and Counters? (12)

OR

18. In the manual operation of a sheet metal stamping press, a two-button safety interlock system is often used to prevent the operator from inadvertently actuating the press while his hand is in the die. Both buttons must be depressed to actuate the stamping cycle. In this system, one press button is located on one side of the press while the other button is located on the opposite side. During the work cycle, the operator inserts the part into the die and depresses both push-buttons, using both hands.

a. Write the truth table for this interlock system

b. Write the boolean logic expression for the system

c. Construct the logic network diagram for the system

d. Construct the ladder logic diagram for the system. (20)