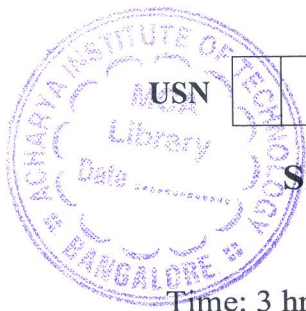


# CBCS SCHEME



18MT61

## Sixth Semester B.E. Degree Examination, Dec.2023/Jan.2024 PLC and SCADA

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Define PLC. Explain PLC with a block diagram. (10 Marks)  
b. Explain the types of PLC with specification. (10 Marks)

OR

- 2 a. Discuss the process of processor software/executive software. (10 Marks)  
b. Write the characteristics and advantages of PLC. (10 Marks)

### Module-2

- 3 a. Construct ladder diagram for the following : (10 Marks)  
i) NAND gate ii) NOR gate iii) X-OR gate.  
b. Develop a 4:1 multiplexer using ladder logic. Assume the inputs are connected to I: 0/1 and I: 0/2, I: 0/3, I: 0/4, control signal signals are connected to I: 0/5 and I: 0/6 and output terminal is O: 0/1. (10 Marks)

OR

- 4 a. State De-Morgan's theorem and construct its equivalent ladder diagram. (10 Marks)  
b. A selection committee comprises four members including the chairman. In order for a candidate to be selected, he or she has to have the support of at least two members. The chairman however can push any candidate through. If each member is provided with a switch, develop a logic that will ring a bell when a candidate is selected. (10 Marks)

### Module-3

- 5 a. Explain ON timer and OFF timer working in detail. (10 Marks)  
b. Explain:  
i) Masked comparison for equal (MEQ). (10 Marks)  
ii) Limit test instruction (LIM) in detail.

OR

- 6 a. Explain the working of Count UP (CTU) and Count Down (CTD) in detail. (10 Marks)  
b. Explain the following comparison instruction:  
i) EQUAL or EQU instruction  
ii) Not EQUAL or NEQ instruction  
iii) LESS THAN or LESS instruction  
iv) GREATER THAN or GRT instruction. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

**Module-4**

- 7 a. Explain parallel I/O system and serial I/O system. (10 Marks)  
b. Write a note on : i) Threshold detection ii) Isolation. (10 Marks)

OR

- 8 a. Describe I/O modules in hazardous locations. (10 Marks)  
b. Explain the types of analog input modules. (10 Marks)

**Module-5**

- 9 a. Define SCADA. Explain typical architecture of SCADA system. (10 Marks)  
b. Explain petroleum refining process in detail. (10 Marks)

OR

- 10 a. Explain first generation-monolithic SCADA architecture and second generation-distributed SCADA architecture. (10 Marks)  
b. Explain water purification system in detail. (10 Marks)

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