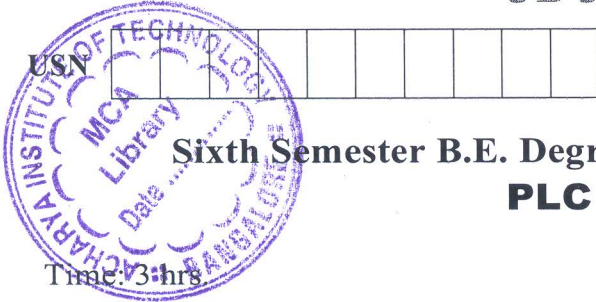


CBCS SCHEME



18MT61

Sixth Semester B.E. Degree Examination, July/August 2022 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. What is PLC? Write the technical definition of PLC. State advantages of PLC and explain the types of PLC. (10 Marks)
- b. State the characteristics of PLC. Differentiate between PLC and PC. (10 Marks)

OR

- 2 a. Draw the block diagram of PLC and also explain each component. (10 Marks)
- b. Discuss the process of processor software/executive software. (10 Marks)

Module-2

- 3 a. Draw the ladder diagram of following logic gates:
i) NOR; ii) XOR; iii) AND; iv) NAND and OR gate. (10 Marks)
- b. Determine the De Morgans theorem and design the ladder diagram. (10 Marks)

OR

- 4 a. Implement 1:4 MUX, 1:8MUX and 4:1 DEMUX logic using the equivalent ladder diagram. (10 Marks)
- b. Write the steps present in program format. A railway platform has 3 platforms A, B and C. A train is coming into the station. It has to be given entry to platform "A" if "A" is empty. If both A and B are occupied it has to be given entry to platform "C". If all the platforms are occupied then the train has to "wait". Design the necessary logic diagram. (10 Marks)

Module-3

- 5 a. Explain the following with a neat diagram:
i) Timer on Delay (TON)
ii) Timer off delay (TOFF)
iii) Count up (CTU)
iv) Count Down (CTD). (10 Marks)
- b. Design the equivalent ladder diagram for an agitator motor system having the following conditions:
Agitator starts after 5 seconds the pump can be started when pump is switched off the agitator also stops. When agitator goes off, it cannot be started for 3 seconds. (10 Marks)

OR

- 6 a. Explain the comparison instruction in detail. (12 Marks)
- b. Draw a ladder diagram for a two motor system having the following conditions:
The start switch starts motor 1 and 2. The stop switch stops motor 1 first and after 15 seconds motor 2 stops. (08 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 the following:
i) Direct I/O ii) Parallel I/O iii) Serial I/O system. (10 Marks)
b. What are power supply requirement and power supply configuration in PLC? (10 Marks)

OR

- 8 a. Explain the following concept in I/O modules:
i) Discrete Input module. (10 Marks)
ii) Threshold Detection (10 Marks)
iii) Isolation.
b. Describe the I/O modules in hazardous location.

Module-5

- 9 a. Draw and explain three generations SCADA architecture. (12 Marks)
b. Define what is SCADA. Explain the desirable properties of SCADA. (08 Marks)

OR

- 10 Explain the following;
a. Petroleum refining process. (10 Marks)
b. Water purification system. (10 Marks)
