CBCS SCHEME

USN | | | | | | | | | | |

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 DENUX 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 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)**

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.
ii) Threshold Detection
iii) Isolation. **(10 Marks)**
b. Describe the I/O modules in hazardous location. **(10 Marks)**

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)**

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