USN | | | | | | | | | | 18RA61

Sixth Semester B.Tech. Degree Examination, June/July 2023
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.   Draw a block diagram of typical PLC and explain the functions of each block. **(10 Marks)**
   b.   Explain with help of neat flow chart, the working process of processor S/W /Executive S/W. **(10 Marks)**

OR

2   a.   Give the technical definitions of PLC. Describe the characteristics function of a typical PLC. **(08 Marks)**
   b.   List and explain the different types of PLCs. **(07 Marks)**
   c.   List the advantages of PLC over relay. **(05 Marks)**

Module-2

3   a.   List and explain the various input output program symbols used in ladder diagram taking case of numbering system. **(08 Marks)**
   b.   Design and explain an equivalent ladder diagram for AND gate, NAND gate, NOR gate and XOR gate. **(12 Marks)**

OR

4   a.   Draw a equivalent ladder diagram for multiplexer (4:1) (8:1) and demultiplexer (1:4). **(12 Marks)**
   b.   State and explain the De Morgan theorem and deduce the ladder diagram. **(08 Marks)**

Module-3

5   a.   List and explain the timer instruction used in all PLCs. **(07 Marks)**
   b.   Explain the format of timer instruction element and address timer. **(08 Marks)**
   c.   Design equivalent ladder diagram for ON delay instructions. **(05 Marks)**

OR

6   a.   Explain the operation of PLC counterup and down with relevant ladder diagram. **(10 Marks)**
   b.   List and explain the comparison instruction used in PLC program. **(10 Marks)**

Module-4

7   a.   With neat block diagram, explain the system overview of 1/0 module and SLC 100 combination of 1/0 module. **(10 Marks)**
   b.   Explain sinking and sourcing module with complete block diagram or circuit diagram. **(10 Marks)**

OR

8 a. Explain the following with diagram:
    i)   Power conversion
    ii)   Threshold detection
    iii)   Isolation. **(08 Marks)**
   b. Explain the typical block diagram of analog voltage I/P module. **(08 Marks)**
   c. Write short notes on input output module in Hazardous power supply requirement.
    (04 Marks)

Module-5

9 a. What is SCADA differentiate between PLCs and SCADA system? **(08 Marks)**
   b. Explain the SCADA architecture for distribute system and network system. **(08 Marks)**
   c. List the feature and application of SCADA. **(04 Marks)**

OR

10 a. Draw and explain the typical SCADA architecture system. **(10 Marks)**
    b. Explain with neat sketch the SCADA system. Used in petroleum refining process system.
    (10 Marks)

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