



# CBCS SCHEME

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## Sixth Semester B.E. Degree Examination, June/July 2019 PLC and SCADA

Time: 3 hrs.

Max. Marks: 80

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

### Module-1

- 1 a. Summarize the block diagram of PLC and explain with a neat diagram. (12 Marks)  
b. Describe the advantages of PLC. (04 Marks)

OR

- 2 a. Discriminate the different types of PLC. (08 Marks)  
b. Differentiate between PLC and PC. (04 Marks)  
c. What are the characteristic functions of PLC? (04 Marks)

### Module-2

- 3 a. Design the equivalent ladder diagram of AND, OR, NAND and NOR gate. (10 Marks)  
b. Illustrate the program format of PLC. (03 Marks)  
c. Determine the DE-Morgan's theorem and design the ladder diagram. (03 Marks)

OR

- 4 a. Design the equivalent ladder diagram of 4:1 MUX, 8:1 MUX, 1:4 DEMUX. (08 Marks)  
b. A railway station has 3 platform A, B, 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 then it has to be the given entry to platform C. If all the platform are full then the train has to wait. Design the necessary ladder diagram. (08 Marks)

### Module-3

- 5 a. Summarize the functional block diagram of PLC timers and Counter's and explain with a neat diagram. (08 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 and, after 15 seconds motor 2 stops. (08 Marks)

OR

- 6 a. 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 the pump is switched off, the agitator also stops; when the agitator goes OFF, it cannot be started for 3 seconds. (08 Marks)  
b. Explain the comparison instructions in detail. (08 Marks)

### Module-4

- 7 a. Explain the following:  
i) Direct I/O  
ii) Parallel I/O systems  
iii) Serial I/O systems (10 Marks)  
b. Mention sinking and sourcing in detail with neat diagram. (06 Marks)

OR

- 8 a. What are the power supply requirement and power supply configuration in PLC? (10 Marks)  
b. Explain Threshold Detection and Isolation in PLC systems. (06 Marks)

Module-5

- 9 a. Draw the architecture and communication requirement in SCADA system and explain in detail. (12 Marks)  
b. Describe the advantages, disadvantages and applications of SCADA system. (04 Marks)

OR

- 10 a. Define SCADA and SCADA function in water purification system. (08 Marks)  
b. Mention the operation of SCADA system in petroleum Refining process with neat diagram. (08 Marks)

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