



CBCS SCHEME

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Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020 Programmable Logic Controllers

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Explain the typical parts of PLC with a neat block diagram. (10 Marks)
b. Explain different types of PLC programming languages. (10 Marks)

OR

- 2 a. Explain the modes of operation of PLC. (10 Marks)
b. Explain typical PLC scan cycle. (10 Marks)

Module-2

- 3 a. Explain the operation of electromagnetic latching relay circuit with the help of hardwired control circuit, also explain the operation of output latch and output unlatch instruction. (10 Marks)
b. Explain the operation of ON-delay times with timing diagram. Give a ladder program example. (10 Marks)

OR

- 4 a. Explain different types of sensors used with PLC. (10 Marks)
b. Design a PLC program for a sequential process control task as follows :
i) Start button is pressed
ii) Conveyor motor is started
iii) Package moves to the position of the limit switch and automatically stops.
Other auxiliary features include
i) A stop button that will stop the conveyor
ii) A red pilot light to indicate the conveyor is stopped
iii) A green pilot light to indicate the conveyor is running. (10 Marks)

Module-3

- 5 a. Explain the operation of cascading counters with one example. (10 Marks)
b. Design a PLC program to control 3 pilot lamps using Jump instruction and explain its operations. (10 Marks)

OR

- 6 a. Explain the safety circuitry requirements for a PLC installation with a neat diagram. (10 Marks)
b. Explain Master Control Reset (MCR) instruction with ladder logic program. (10 Marks)

Module-4

- 7 a. Design a PLC program to ADD the accumulated counts of two Up counters and explain Addition (ADD) instructions. (10 Marks)
b. Explain any five data compare instruction with suitable examples. (10 Marks)

OR

- 8 a. Explain the operation of Division instruction (DIV) with an example. (10 Marks)
b. Explain Move with Mask(MVM) instruction with an example. (10 Marks)

Module-5

- 9 a. Explain Bit Shift Left(BSL) and Bit Shift Right(BSR) instructions with suitable examples. (10 Marks)
b. Discuss the structure of control systems. (10 Marks)

OR

- 10 a. Explain the concept of Supervisory Control And Data Acquisition (SCADA) system used in industry. (10 Marks)
b. Explain the operation of sequences output instruction with one example. (10 Marks)
