

10EE752

Seventh Semester B.E. Degree Examination, June/July 2019 Programmable Logic Controllers

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO full questions from each part.

PART - A

- 1 a. What is PLC? Explain its hardware with the help of a neat block diagram. Mention its advantages. (10 Marks)
- b. With relevant diagram, explain the operation of absolute encoder with incremental encoder. (10 Marks)
- 2 a. Explain a latch circuit with the help of an example. (06 Marks)
- b. What are proximity switches? Explain the different types of proximity switches. (06 Marks)
- c. Write the ladder diagram for the following logic functions:
i) AND ii) NAND iii) NOT iv) NOR. (08 Marks)
- 3 a. Explain structured text implementation of conditional statement, iterative statement. (06 Marks)
- b. Explain how branching and convergence is realized using sequential functional chart. (06 Marks)
- c. Explain the jump within jump operations, with the help of a suitable example. (08 Marks)
- 4 a. Write the instruction list for the ladder diagrams shown in Fig.Q.4(a), (i) and (ii). (04 Marks)

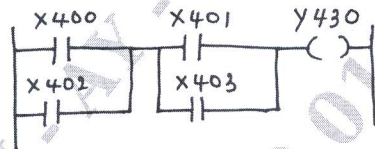


Fig.Q.4(a) (i)

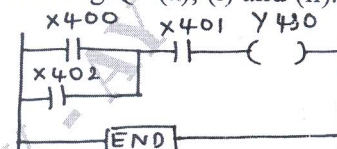


Fig.Q.4(a) (ii)

- b. Draw the ladder diagram and instruction list (IL) program for a system where there has to be no output when any one of the four sensors gives an output, otherwise there is to be an output. (06 Marks)
- c. Explain the structure of a sequential function chart. For the ladder diagram shown in Fig.Q.4(c), obtain its equivalent sequential function chart. (10 Marks)

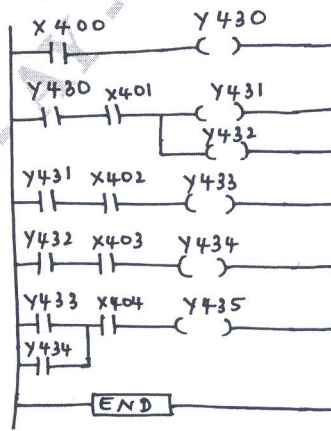


Fig.Q.4(c)

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.

PART – B

- 5 a. Explain the working of a master control relay with the help of an example. (06 Marks)
b. Explain the working of battery-backed relay. (06 Marks)
c. Explain SET and RESET function with respect to internal relay. (08 Marks)
- 6 a. Explain different types of timers with timing diagram. (06 Marks)
b. Explain with the ladder diagram usage of timer for flashing the lights on and off as long as there is an output occurring. (06 Marks)
c. With the ladder program and timing diagram, explain to start 3-motors in sequence with some time delay using a single start button. (08 Marks)
- 7 a. Explain use of counter to extend the range of timer. (06 Marks)
b. Write a note on up-down counting with necessary ladder diagram. (06 Marks)
c. Write an instruction list program for a counter to control a machine which is required to direct 6 tins along one path for packing a box and then 12 tins for packing another box. A deflector might be controlled by a photocell sensor that given an output every times a tin passes and also draw the ladder diagram. (08 Marks)
- 8 a. Explain 4-bit shift register with neat ladder diagram. (10 Marks)
b. Write short notes on data handling and arithmetic operations in PLCs. (10 Marks)
