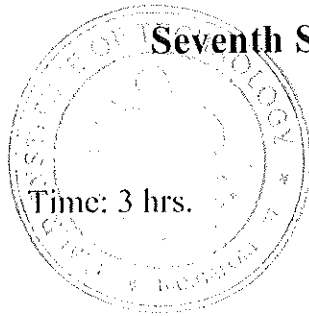


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10EE752



Seventh Semester B.E. Degree Examination, June/July 2016

Programmable Logic Controllers

Max. Marks:100

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

PART – A

- 1 a. Explain with necessary diagrams, the Linear variable differential transformer (LVDT) for measuring the position of an object. (08 Marks)
- b. Illustrate the voltage levels of input/output unit of a PLC. (06 Marks)
- c. Write a note on remote input and output connection to PLC. (06 Marks)
- 2 a. Explain different layers present in network standard (ISP/OSI) model. (08 Marks)
- b. What are limit switches? Explain different types of limit switches. (06 Marks)
- c. What is ladder diagram? Explain the conventions to be followed while drawing the ladder diagram. (06 Marks)
- 3 a. Write the logic diagram, ladder diagram and functional block diagram for the following logic function.
 - i) AND
 - ii) OR
 - iii) XOR gates. (06 Marks)
- b. Draw the ladder diagram to motor controlled by stop and start push button switches and for which one signal light must be illuminated when the power is applied to the motor and another when it is not applied. Follow the ladder diagram with Mitsubishi notation for the address. (06 Marks)
- c. For the following Boolean equation

$$Y = A + B(A + \overline{CB} + \overline{D}AC) + ABCD$$
 - i) Draw the ladder diagram for the unsimplified equation.
 - ii) Simplify the equation.
 - iii) Draw the ladder diagram for the simplified equation. (08 Marks)
- 4 a. Explain with example, the conditional/iteration statements used in structured text. (08 Marks)
- b. Explain the Jump within Jump operation with the help of an example. (06 Marks)
- c. Explain with diagram, how branching and convergence is represented by an SFC and ladder diagram. (06 Marks)

PART – B

- 5 a. Explain the significance of internal relays in PLC operations. With the help of an example explain the role of internal relay in latch circuit. (08 Marks)
- b. Explain one – shot operation with necessary ladder diagram. (06 Marks)
- c. With necessary ladder diagram and instruction list, explain the principle of operation of master control relay. (06 Marks)

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.

- 6 a. Explain with ladder diagram and timing diagram, how to start three motors in sequence with some delay using single start button, timer and internal relays. (08 Marks)
- b. Explain with ladder diagram usage of timer for flashing the lights on and off as long as there is an output occurring. (06 Marks)
- c. Explain the basic form of counting circuit with neat ladder diagram and instruction list (Mitsubishi program) and input and output waveform. (06 Marks)
- 7 a. With necessary ladder diagram, explain the operation of pulse timer. (06 Marks)
- b. Explain with neat ladder diagram and instruction list how a machine is to be controlled such that it is required to direct 12 tins along one path for packing in a box and then 24 tins along another path for packing in another box. A deflector plate may be controlled by a photocell sensor that gives an output every time a tin passes it. (08 Marks)
- c. Explain various timers used in PLC and how cascaded timers are used to produce a delay of 1099s. (06 Marks)
- 8 a. Write a short notes on data handling and arithmetic operations in PLCs. (10 Marks)
- b. Explain with a ladder diagram and instruction list, the operation of a 4 – bit shift register program in Mitsubishi PLC. (10 Marks)

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