

GUJARAT TECHNOLOGICAL UNIVERSITY
BE – SEMESTER VIII(OLD) • EXAMINATION – WINTER 2017

Subject Code:182001

Date: 10-11-2017

Subject Name: Programmable Logic Controller

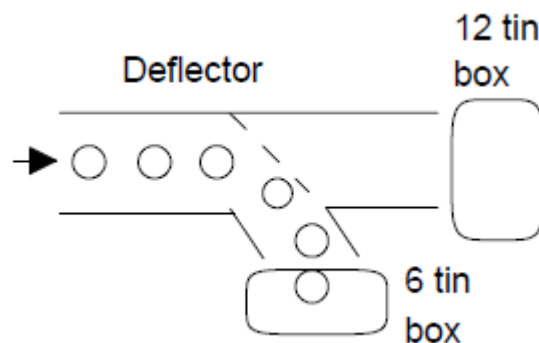
Time: 02:30 pm to 05:00 pm

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Draw the basic hardware block diagram interfaced with PLC. Explain each block. **07**
- (b) List out different timer instructions in PLC and explain any two of them with timing diagrams. **07**
- Q.2** (a) Show various kinds of connections of PLC with remote input /output modules. **07**
- (b) What is cycle time of PLC. Describe the PLC continuous updating procedure. Which are different factors on which cycle time depends on? **07**
- OR**
- (b) Draw the functional logic diagram for $(A.B + C)\bar{D}$. $E.\bar{F} = Q$ and draw ladder diagram for it. **07**
- Q.3** (a) What is the sequential functional chart (SFC)? Explain it with washing machine operation example. **07**
- (b) What is Master Control Relay? With a drawing explain the principle of using MCR in a ladder. **07**
- OR**
- Q.3** (a) Describe the various types of Jump instructions. **07**
- (b) Draw and explain closed loop control of any process using PLC. **07**
- Q.4** (a) Which are different types of timers. Explain operation of each with timing diagram. **07**
- (b) Draw SFC and ladder diagram for traffic light sequence operation. **07**
- OR**
- Q.4** (a) Consider the problem of the control of a machine which is required to direct 6 tins along one path for packaging in a box and then 12 tins along another path for packaging in another box (Figure 1). A deflector plate might be controlled by a photocell sensor which gives an output every time a tin passes it. Write a ladder programme to execute this task automatically using PLC. **07**



- (b) Write a detailed note on arithmetic functions of PLC **07**

- Q.5 (a) Draw the ladder diagram of four basic Digital logic Gates. Convert each Gate ladder into Instruction list programming. **07**
- (b) Explain any three types of input and output devices with their wiring connections to PLC. **07**

OR

- Q.5 (a) A 10-bit bipolar analog input has an input range of -5 to +5 volts. If the converter outputs the binary number 01101111012 what is the voltage being read? **07**
- (b) Explain fail safe connection of start and stop switches with PLC with suitable wiring and ladder diagram. **07**

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