Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER VIII(OLD) • EXAMINATION – WINTER 2017

Subject Code:182001 **Date: 10-11-2017**

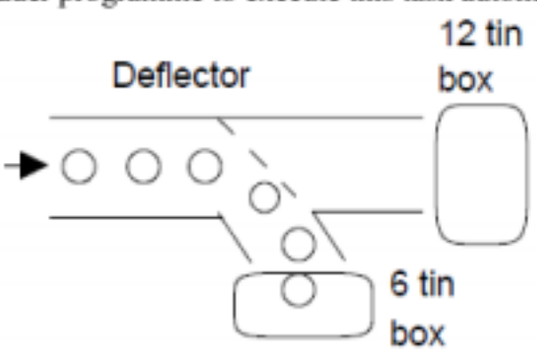
Subject Name: Programmable Logic Controller

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 continous updating procedure. Which are different factors on which cycle time depends on?	**07**
		OR	
	(b)	Draw the functional logic diagram for $(A.B + C)\overline{D}$. $E.\overline{F} = Q$ 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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