Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2014

Subject code: 710305N **Date: 21-06-2014**

Subject Name: Programmable Logic Controller

Time: 02:30 pm - 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)**	Explain with block diagram, Programmable Logic Controller.	**07**
	(b)	Explain with suitable example, merits and demerits of PLC over conventional relay based systems.	**07**
Q.2	**(a)**	Explain PLC timer instruction with timing diagram of each.	**07**
	(b)	Draw a ladder logic program to generate square wave pulse of 1 Mhz.	**07**
		OR	
	(b)	Explain PLC I/O modules with diagram.	**07**
Q.3	**(a)**	With suitable diagram, explain PLC arithmetic instructions.	**07**
	(b)	Develop a ladder logic program to convert temperature reading stored in REG001 from Kelvin to Celsius.	**07**
		OR	
Q.3	**(a)**	Explain with suitable diagram, PLC logical instructions.	**07**
	(b)	Draw ladder logic program to perform 1. F(a,b,c) = Ø (0,1,3,5,6) 2. Exclusive OR gate	**07**
Q.4	**(a)**	Explain PLC rotate instructions with suitable example.	**07**
	(b)	Explain following instruction with suitable examples of each. 1. MCR 2. SKIP 3. JUMP	**07**
		OR	
Q.4	**(a)**	Explain bit functions of PLC.	**07**
	(b)	Explain following instruction with suitable examples of each. 1. RTO 2. CTU 3. RESET	**07**
Q.5	**(a)**	Explain table to register move instruction.	**07**
	(b)	Explain scan cycle of PLC.	**07**
		OR	
Q.5	**(a)**	Develop a ladder logic program for parking utility. At an entry and exit sensors are kept to detect entry or exit. Total of 20 cars at max can be parked. Allow entry of car only if the total number of cars parked is less than 20.	**07**
	(b)	There are two motors M1 and M2. Make master ON/OFF and individual button to ON/OFF each and make sure that atleast one motor at a time must be running.	**07**

****