Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2013

Subject code: 710305N **Date: 06-06-2013**

Subject Name: Programmable Logic Controller

Time: 10.30 am – 01.00 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 the technique by which PLC scan and execute any ladder program.	**07**
	(b)	Explain the difference between data processing computer and process control computers with help of functional block diagram.	**07**
Q.2	**(a)**	Enumerate types of PLC modules and explain discrete DC output module showing its internal functional block diagram.	**07**
	(b)	Discuss merits and demerits of PLC.	**07**
		OR	
	(b)	What is the difference between discrete I/O and digital I/O? Explain with the help of suitable examples.	**07**
Q.3	**(a)**	Realize 8X1 multiplexer circuit using PLC ladder diagram.	**07**
	(b)	Explain in details counters in PLC.	**07**
		OR	
Q.3	**(a)**	Develop PLC ladder to realize following Boolean equation: (1) X = A+B(A + CBô+ DAôC) + ABCD (2) Y = (A+BAô) + (C+ D + ECô)ô	**07**
	(b)	Explain in details timers in PLC.	**07**
Q.4	**(a)**	List out PLC comparison functions. Explain Greater than or equal to (GEQ) and less than or equal to (LEQ) functions with suitable examples.	**07**
	(b)	Develop Ladder Logic Diagram to generate square wave.	**07**
		OR	
Q.4	**(a)**	Explain following PLC functions with suitable examples: 1) SKIP 2) Jump with return 3) Block Move	**07**
	(b)	Make a program to increase the counter by one with each pulse from the pulse generator PG and decrease another counter by the same pulse.	**07**
Q.5	**(a)**	Explain PLC shift register functions with suitable example.	**07**
	(b)	Construct ladder diagram for the following process: Two motors are to be controlled as follows: ▪ When the switch is operated both motor must run ▪ After 3 min motor one must stop ▪ Motor two continue running for another 3 min ▪ At this point lamp must go ON ▪ After further 2 min, lamp goes OFF and cycle repeats ▪ If stop switch is operated at any time, the system will continue till end of the cycle and then stop.	**07**
		OR	
Q.5	**(a)**	List all PLC Matrix Functions. Explain any one in details.	**07**
	(b)	Write a short note on PLC networking.	**07**

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