Enrolment No._____

Seat No.: _____ Enrolment No._____ GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VIII EXAMINATION – WINTER 2015			
Su Su	bject bject	t Code:182001 Date: 09/12/201 t Name: PROGRAMMABLE LOGIC CONTROLLERS	15
Time: 2:30pm to 5:00pmTotal Marks: 7			70
Ins	tructio 1. 2. 3.	ons: Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks.	
Q.1	(a)	Draw a block diagram of a PLC showing the main functional items and how buses link them, explaining the functions of each block	07
	(b)	Explain the operation of the following input devices, stating the form of the signal being sensed and the output: (a) reed switch, (b) incremental shaft encoder, (c) photoelectric transmissive switch, (d) diaphragm pressure switch.	07
Q.2	(a)	When a new PLC is required to be purchased to control a large system, which specifications are to be listed for the PLC order? Explain all of them in detail.	07
	(b)	Explain the FBD Programming with example/diagrams OR	07
	(b)	What is IL programming in PLC ? Explain different IL mnemonics codes.	07
Q.3	(a)	Devise ladder programs for systems that will carry out the following tasks: (a) Switch on an output 5 s after receiving an input and keep it on for the duration of that input.	07
	(b)	 (b) Switch on an output for the duration of the input and then keep it on for a further 5 s. (c) Switch on an output for 5 s after the start of an input signal. Devise ladder programs for systems that will carry out the following tasks: (a) Give an output after a photocell sensor has given 10 pulse input signals as a result of detecting 10 objects passing in front of it. (b) Give an output when the number of people in a store reaches 100, there continually being people entering and leaving the store. 	07
0.3	(a)	Explain the continuous updating and the mass input/output copying methods of processing	07
C	(b)	inputs/outputs. Explain different JUMP operations using PLC ladder diagram.	07
Q.4	(a) (b)	What is the purpose of master control Relay? Explain with suitable example.Devise ladder programs for systems that will carry out the following tasks:(a) Switch on a pump when the water level in a tank rises above 1.2 m and switch it off when it falls below 1.0 m.(b) Switch on a pump, then 100 s later switch on a heater, then a further 30 s later switch on the circulating motor.	07 07
~ .		OR	
Q.4	(a) (b)	Enlist different data comparison instructions in PLC and explain importance of scan time.	07 07
Q.5	(a)	Devise ladder programs for systems to carry out the following tasks: Control of a paint sprayer in a booth through which items pass on an overhead conveyor so that the paint is switched on when a part is in front of the paint gun and off when there is no part. The items are suspended from the overhead conveyor by hooks, not every hook having an item suspended from it.	07
	(b)	Devise a timing watchdog program to be used to switch off a machine if faults occur in any of the systems controlling its actions.	07
0 5	$\left(\cdot \right)$	OR	07
Q. 5	(a) (b)	Explain in Detail Remote connections, Interfacing & Standard with PLC.	07 07