Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- VIIth SEMESTER–EXAMINATION – WINTER- 2012

Subject code: 170802 **Date: 06/01/2013**

Subject Name: Industrial Automation

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)	What is an Industrial Automation ? Why is it an essential part of modern Industrial Process ?	07
	(B)	Explain Various types of Automation Techniques applied in Production Systems with suitable example.	07
Q-2	(A)	Define following terms with respect to Process control 1. Error 2. Variable Range 3. Control Parameter Range 4. Control Lag 5. Dead Time 6. Cycling 7. Controller Modes	07
	(B)	Define following Process Characteristics: 1. Process Equation 2. Process Load 3. Process Lag 4. Self-Regulation	07
		OR	
Q-2	(A)	Differentiate two position mode, multi position mode and floating control modes with suitable example	07
	(B)	Explain PID Controller with suitable application in Industrial Process Control	07
Q-3	(A)	Draw block diagram of PLC and explain each block in detail.	07
	(B)	Develop & explain the Ladder Diagram using Timer and Counter Functions for a process where a Paint Spray has to run for 45 seconds after a count of 15 from a sensor. Use suitable labels and standard PLC Addresses.	07
		OR	
Q-3	(A)	Explain various types of I/O Modules and Explain the Layout of I/O separately connected to PLC.	07
	(B)	Develop & explain the Ladder Diagram for a Pressure measurement and control jig	07
Q-4	(A)	Explain Timer and Counter Functions used in PLC with Timing Diagrams	07
	(B)	Develop &explain the Ladder Diagram for Standard Traffic Control Signals	07
		OR	
Q-4	(A)	Explain basic Architecture of DCS, justifying role and significance of each and every component of it.	07
	(B)	Explain different types of Communication Standards used in DCS	07
Q-5	(A)	Discuss relative merits & demerits of PLC , DCS and SCADA	07
	(B)	Discuss hierarchical Evolution of DCS. Explain Operating Mechanism of DCS for a Typical Industry	07
		OR	
Q-5	(A)	Discuss Direct Digital Control with suitable diagram	07
	(B)	Explain Briefly functioning of SCADA	07

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