Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2023

Subject Code:3161715 Date:12-07-2023

Subject Name:Industrial Data Communication and Distributed control system

Time:10:30 AM TO 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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	List out advantages of DCS.	**03**
	(b)	Draw a block diagram of DCS showing all main blocks with functionality.	**04**
	(c)	Draw a block diagram of hierarchical computer control system for large manufacturing process. List out the task carried out by level 1 & 2.	**07**
Q.2	**(a)**	Write full form of: HLOI, LCU, CSMA/CD	**03**
	(b)	Draw the block diagram of Direct Digital Control system.	**04**
	(c)	What types of displays are available in DCS? Explain any two with suitable diagram.	**07**
		OR	
	(c)	Discuss features of DCS Keyboard with key functions used in control console equipment.	**07**
Q.3	**(a)**	Describe features of fibre-optic data highway cable.	**03**
	(b)	What is sub-commutation and super-commutation in context of Multiplexer system?	**04**
	(c)	Explain Position algorithm in detail	**07**
		OR	
Q.3	**(a)**	Explain concept of availability in DCS.	**03**
	(b)	Summarize the characteristics to consider while selecting multiplexer equipment.	**04**
	(c)	Explain Velocity algorithm in detail	**07**
Q.4	**(a)**	Explain programming languages for process control.	**03**
	(b)	Explain SMART transmitter.	**04**
	(c)	Describe PROFIBUS with its bus access method, services & acceptance.	**07**
		OR	
Q.4	**(a)**	What are the functions of executive program?	**03**
	(b)	Explain MAP / TOP protocol.	**04**
	(c)	Describe RACKBUS with its access method, gateway and availability.	**07**
Q.5	**(a)**	Describe man machine interface.	**03**
	(b)	Explain supervisory control and optimization.	**04**
	(c)	Explain Foxboro I/A series DCS system used in industry.	**07**
		OR	
Q.5	**(a)**	Explain alarm access architecture for DCS and supervisory computer display.	**03**
	(b)	Describe Gateway to interface computer with DCS.	**04**
	(c)	Explain Honeywell PlantScape DCS system used in industry.	**07**

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