GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER–VI (NEW) EXAMINATION – WINTER 2024

Subject Code:3161715   **Date:02-12-2024**

Subject Name: Industrial Data Communication and Distributed control system

Time:02:30 PM TO 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.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	List task carried out at level 3 in any industrial plant.	03
	(b)	Explain Reductant and Fault tolerance system.	04
	(c)	Explain in detail with neat figure different types of network topologies.	07
Q.2	**(a)**	Explain briefly about centralized control system.	03
	(b)	Discuss the following terms: 1)Supercommutation and Subcommutation 2)HLOI and LLOI	04
	(c)	Compare various types of network access protocols.	07
		OR	
	(c)	Discuss with the help of suitable diagram the hierarchical structure of DCS in detail.	07
Q.3	**(a)**	Define software configuring and state two phases of software configuration	03
	(b)	Explain following digital algorithms: i)Emergency response ii) Error squared	04
	(c)	Explain Position algorithm in detail.	07
		OR	
Q.3	**(a)**	Define following terms: Port, Modem and Baud rate.	03
	(b)	Explain Feedforward Control scheme and algorithm for DCS.	04
	(c)	Explain Velocity algorithm in detail.	07
Q.4	**(a)**	Compare between General Purpose Computer used in industry and DCS.	03
	(b)	Compare between interpreter and compiler.	04
	(c)	Explain in detail ISO reference model.	07
		OR	
Q.4	**(a)**	Compare between PLC and DCS.	03
	(b)	What is communication protocol? Give an example of any one communication protocol.	04
	(c)	Draw the figure representing the communication hierarchy in the company. Also give the comparison between the fieldbus and management level data characteristics.	07
Q.5	**(a)**	Draw a block diagram of direct digital control system.	03
	(b)	Compare between MAP and TOP protocol.	04
	(c)	Draw bus access method, data link service, application services, acceptance of PROFIBUS protocol.	07
		OR	
Q.5	**(a)**	What is the concept of Man Machine Interface?	03
	(b)	Describe integrating of PLC with DCS.	04
	(c)	Explain in detail bus access method, application services, transmission modes, acceptance of MODBUS protocol.	07

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