GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VI (NEW) EXAMINATION – WINTER 2023

Subject Code:3161715   **Date:11-12-2023**

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.**

			MARKS
Q.1	(a)	State full form of: MAP, CSMA/CD, MTBF.	03
	(b)	What is centralized computer system? Explain briefly.	04
	(c)	With suitable diagram explain hierarchical computer system structure of large manufacturing plant in detail.	07
Q.2	(a)	What is redundant and fault tolerant system?	03
	(b)	Explain the role of console or HLOI in control room.	04
	(c)	Describe various types of displays available in DCS, with suitable figure.	07
		OR	
	(c)	Draw and explain the block diagram of Direct Digital Control system.	07
Q.3	(a)	Compare star and ring topologies to access network.	03
	(b)	Explain operating system configuration of DCS briefly.	04
	(c)	Describe types of Local Control Units in DCS.	07
		OR	
Q.3	(a)	Compare super and sub-commutation in multiplexers.	03
	(b)	Explain algorithm libraries of DCS in brief.	04
	(c)	Explain different types of programs with their functions and features in process control programming.	07
Q.4	(a)	Describe features of power supply installed in control unit.	03
	(b)	Discuss features of SMART Transmitter in brief.	04
	(c)	Explain MODBUS with its access methods, application services, transmission modes and acceptance.	07
		OR	
Q.4	(a)	Describe transmission media used in communication.	03
	(b)	Describe Velocity algorithm in software configuration of DCS.	04
	(c)	Explain FIP-BUS with bus access methods, features and acceptance.	07
Q.5	(a)	List three manufacturers of DCS available in market.	03
	(b)	Explain communication hierarchy to understand data exchange at various levels in production company.	04
	(c)	Describe the Gateway as computer interface with DCS considering its hardware and software aspects.	07
		OR	
Q.5	(a)	List at least three functions performed by production monitoring and control.	03
	(b)	Explain display access method of DCS and supervisory computer.	04
	(c)	Explain Foxboro I/A series DCS system in detail.	07