

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI EXAMINATION – SUMMER 2025

Subject Code:3161715

Date:28-05-2025

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) Explain centralized computer system briefly.	03
	(b) Describe the duties performed by level 1 & 2 of computer control system.	04
	(c) Explain about any DCS model used in industry with details.	07
Q.2	(a) Summarize advantages and disadvantages of DCS.	03
	(b) List out DCS displays. Explain any one in detail.	04
	(c) Describe signal multiplexer with its design, system configuration and remote station.	07
	OR	
	(c) Explain about keyboard used for DCS in detail. Describe the functions performed by keys in DCS.	07
Q.3	(a) Describe alarm access architecture in context of DCS.	03
	(b) What is role of dedicated card controller in LCU?	04
	(c) Explain transmission protocol PROFIBUS in detail.	07
	OR	
Q.3	(a) What is availability in context of DCS?	03
	(b) Discuss features of data highway cables used in industrial communication.	04
	(c) Explain transmission protocol MODBUS in detail.	07
Q.4	(a) Explain programming languages for process control.	03
	(b) Describe Gateway to interface computer with DCS.	04
	(c) What is Algorithm? Describe position algorithm in detail.	07
	OR	
Q.4	(a) Explain role of Executive program.	03
	(b) Describe the tasks performed by Supervisory Computer.	04
	(c) Explain operating system configuration and controller function configurations in context of DCS.	07
Q.5	(a) Match the following:	03
	DCS Vendor DCS Model	
	1) Honeywell a) Centum VP/CS	
	2) Emerson b) TDC 3000	
	3) Yokogawa c) DeltaV series	
	(b) Discuss benefits of DCS integration with PLC and computer.	04

- (c) Describe token passing, CSMA/CD and master slave bus access methods with suitable diagram. **07**

OR

- Q.5** (a) Explain Network linkages briefly. **03**
(b) Describe data exchange communication hierarchy for any CIP model. **04**
(c) Compare Modbus, Profibus and FIP-bus in detail. **07**
