

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**DIPLOMA ENGINEERING – SEMESTER – 4 • EXAMINATION – WINTER- 2017**

**Subject Code: 3341702****Date: 07-11-2017****Subject Name: Programmable Logic Controller and Distributed Control****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.**

- Q.1** Answer any seven out of ten. **14**
1. List out four PLC applications for automation in industries.
  2. State advantages of PLC.
  3. List out four peripherals of PLC.
  4. Name different programming languages used for PLC programming.
  5. List out different switching device used as digital input for PLC.
  6. Draw physical ladder symbol for NC pressure switch.
  7. Draw trend display.
  8. Draw bus topology used for DCS.
  9. Sketch group display.
  10. Name different topology used for DCS networking
- Q.2**
- |            |   |           |
|------------|---|-----------|
| <b>(a)</b> | Develop AND logic circuit using two relays.                                 | <b>03</b> |
|            | OR  |           |
| <b>(a)</b> | Develop NOR logic circuit using two relays.                                 | <b>03</b> |
| <b>(b)</b> | Develop ladder logic for NAND logic.  | <b>03</b> |
|            | OR  |           |
| <b>(b)</b> | Develop ladder logic for EX-OR logic.                                       | <b>03</b> |
| <b>(c)</b> | Describe selection criteria for PLC.  | <b>04</b> |
|            | OR  |           |
| <b>(c)</b> | Describe discrete-state process control techniques with the help of sketch. | <b>04</b> |
| <b>(d)</b> | Justify need of automation in industry.                                     | <b>04</b> |
|            | OR  |           |
| <b>(d)</b> | Describe continuous process control techniques with the help of sketch.     | <b>04</b> |

<b>Q.3</b>	(a) State Strengths and limitations of DCS.	<b>03</b>
	OR	
	(a) Develop ladder logic for expression $Y=A+(B'.C)$ .	<b>03</b>
	(b) Develop ladder logic for expression $Y=A+(B+C.D)$ .	<b>03</b>
	OR	
	(b) Describe analog Input module with help of neat sketch.	<b>03</b>
	(c) Draw PLC symbol for (i) NO level switch (ii) NC flow switch	<b>04</b>
	OR	
	(c) Explain isolated input wiring to PLC with sketch.	<b>04</b>
	(d) Develop ladder logic for ON- OFF level control using suitable limit switches.	<b>04</b>
	OR	
	(d) Write a short note on data logger.	<b>04</b>
<b>Q.4</b>	(a) Justify need of automation in industry.	<b>03</b>
	OR	
	(a) Draw Hierarchy of DCS.	<b>03</b>
	(b) List out different isolation technique and explain any one in detail.	<b>04</b>
	OR	
	(b) Explain direct digital control with neat sketch.	<b>04</b>
	(c) Draw and explain PLC architecture with the help of neat sketch.	<b>07</b>
<b>Q.5</b>	(a) Describe function of SCADA in DCS	<b>04</b>
	(b) Explain star topology for DCS.	<b>04</b>
	(c) Draw and explain PLC scan-cycle.	<b>03</b>
	(d) Develop Ladder logic for holding contact.	<b>03</b>

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# ALL THE BEST

Our country needs your technical skill and expertise for development.