

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE- VIIth SEMESTER–EXAMINATION – WINTER- 2012

Subject code: 170802**Date: 06/01/2013****Subject Name: Industrial Automation****Time: 10:30 am – 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.

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|-----------|---|----|
| Q-1 | (A) What is an Industrial Automation ? Why is it an essential part of modern Industrial Process ? | 07 |
| | (B) Explain Various types of Automation Techniques applied in Production Systems with suitable example. | 07 |
| Q-2 | (A) Define following terms with respect to Process control | 07 |
| | <ol style="list-style-type: none"> 1. Error 2. Variable Range 3. Control Parameter Range 4. Control Lag 5. Dead Time 6. Cycling 7. Controller Modes | |
| | (B) Define following Process Characteristics: | 07 |
| | <ol style="list-style-type: none"> 1. Process Equation 2. Process Load 3. Process Lag 4. Self-Regulation | |
| OR | | |
| Q-2 | (A) Differentiate two position mode, multi position mode and floating control modes with suitable example | 07 |
| | (B) Explain PID Controller with suitable application in Industrial Process Control | 07 |
| Q-3 | (A) Draw block diagram of PLC and explain each block in detail. | 07 |
| | (B) Develop & explain the Ladder Diagram using Timer and Counter Functions for a process where a Paint Spray has to run for 45 seconds after a count of 15 from a sensor. Use suitable labels and standard PLC Addresses. | 07 |
| OR | | |
| Q-3 | (A) Explain various types of I/O Modules and Explain the Layout of I/O separately connected to PLC. | 07 |
| | (B) Develop & explain the Ladder Diagram for a Pressure measurement and control jig | 07 |
| Q-4 | (A) Explain Timer and Counter Functions used in PLC with Timing Diagrams | 07 |
| | (B) Develop & explain the Ladder Diagram for Standard Traffic Control Signals | 07 |
| OR | | |
| Q-4 | (A) Explain basic Architecture of DCS, justifying role and significance of each and every component of it. | 07 |
| | (B) Explain different types of Communication Standards used in DCS | 07 |
| Q-5 | (A) Discuss relative merits & demerits of PLC , DCS and SCADA | 07 |
| | (B) Discuss hierarchical Evolution of DCS. Explain Operating Mechanism of DCS for a Typical Industry | 07 |
| OR | | |
| Q-5 | (A) Discuss Direct Digital Control with suitable diagram | 07 |
| | (B) Explain Briefly functioning of SCADA | 07 |

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