

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**B.E. - SEMESTER – VIII EXAMINATION – OCTOBER 2012**

**Subject code: 181701****Date: 27/10/2012****Subject Name: Control System Architecture****Time: 02.30pm - 05.00pm****Total Marks: 70****Instructions:**

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain Control Subsystem with an example of Water Heating Process. Also explain its functional steps in sequence. **07**  
(b) Describe the Automation Strategy for closed loop control. **07**

- Q.2** (a) Explain role of Rack, Bus & Modules in controller hardware structure. **07**  
(b) Explain the term Intrinsic Safety & its application in industry barriers? With neat circuit diagram explain functionality of Intrinsic Safety isolated barriers. **07**

**OR**

- (b) Explain the functions of all the layers in a software structure of controller. **07**

- Q.3** (a) Explain system availability of communication in DCS & NCS. **07**  
(b) Which module is used to monitor health of the controller? Explain it in detail. **07**

**OR**

- Q.3** (a) Describe the application of DCS in Pulp & paper industry. **07**  
(b) Explain remote I/O with block diagram, advantages & disadvantages. **07**

- Q.4** (a) Explain PID function algorithm as well as application. **07**  
(b) Explain 'Function Block Diagram'. Explain structure of Function & Function Block diagram. List down some of the basic & commonly used FBD instructions. **07**

**OR**

- Q.4** (a) List down & explain different types of Alarm Displays available with different Distributed Control Systems. **07**

- Q.4** (b) List down difference between PLC, Loop Controller & Programmable Controller. Explain functionality of Loop Controller with any one example. **07**

- Q.5** (a) Write short note on HAZOP. **07**  
(b) Discuss various activities in project implementation in chemical plant. **07**

**OR**

- Q.5** (a) Write short note on DCS versus SCADA terminology. **07**  
(b) What is application of SCADA in industry? Draw & explain hierarchy of typical SCADA. **07**

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