

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII • EXAMINATION – SUMMER 2014

Subject Code: 170802**Date: 03-06-2014****Subject Name: Industrial Automation****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** (a) Discuss characteristics of different discontinuous controller mode in detail. 07
(b) Explain following terminology with reference to process industry 07
(i) Process Lag (ii) Control Lag (iii) Cycling (iv) Dead time
- Q.2** (a) Explain PI and PD controller modes, give the reason why Derivative 07
controller is not used alone.
(b) What do you mean by distributed control system? Explain the hierarchical 07
structure of DCS in detail with a neat diagram.
- OR**
- (b)(1) List the advantages of Automation. 04
(2) Explain the Evolution of DCS. 03
- Q.3** (a) Explain in detail with suitable diagram, Direct Digital Control 07
(b) Draw and explain the block diagram of PLC. 07
- OR**
- Q.3** (a) Explain basic block diagram of process control loop. 07
(b) Write a short note on Field Station. 07
- Q.4** (a) Explain generalized Automation and Production Systems and their 07
Classification.
(b) Explain in detail the input-output module used in PLC. 07
- OR**
- Q.4** (a) Draw the ladder diagram using timer block to turn on the motor after the 07
delay of 5 seconds after pressing start switch. And turn on the lamp after the
delay of 5 seconds when the motor is OFF. Motor should be OFF after
delay of 3 seconds when stop switch is turned ON.
(b) Describe each component of supervisory digital control with suitable 07
diagram.
- Q.5** (a) Explain Timer and Counter instructions with timing diagram for PLC. 07
(b) Explain the concept of SCADA with a neat diagram in detail. 07
- OR**
- Q.5** (a) Develop a ladder diagram for bottle filling conveyor belt. 07
(b) Explain the concept of networking in DCS. Also explain various network 07
topologies.
