

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI • EXAMINATION – WINTER • 2014****Subject Code: 161702****Date: 28-11-2014****Subject Name: Process Control****Time: 02:30 pm - 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) Explain Linearization in detail. Also give suitable example. **07**
(b) Comment on Energy Balance and its use with process modeling. Also brief about Degree Of Freedom (DOF) and various conditions associated with it. **07**
- Q.2** (a) Explain the following terms: **07**
i. Dead time
ii. Self regulation
(b) Comment on Process reaction curve and explain any one method to obtain First Order Plus Dead Time (FOPTD) model of a plant. **07**
- OR**
- (b) What do you mean by stability? How it is checked with Bode Plots? **07**
- Q.3** (a) Explain On-OFF control with suitable example. Also comment on neutral zone and implementation idea with op-amp. **07**
(b) What is offset in proportional control action mode? Explain how it can be eliminated. **07**
- OR**
- Q.3** (a) Give the procedure to compute tuning parameters P,I and D with Ziegler Nichols Closed Loop method. **07**
(b) Give and explain PID implementation algorithm with digital computers. **07**
- Q.4** (a) What is feed forward control? How it is different from feedback control? Discuss limitations of each. **07**
(b) Explain cascade control with suitable example in detail. **07**
- OR**
- Q.4** (a) Explain ratio control with suitable example. Also discuss its application. **07**
(b) Explain split range control operation in detail. **07**
- Q.5** (a) Explain selective control with suitable example. **07**
(b) Explain any process control system in closed loop mode in your own words and with suitable diagram in detail. **07**
- OR**
- Q.5** (a) Explain PD action. Why PD is unsuitable for the systems with high frequency noise. Why D action sometimes is used with output instead of error in PID? **07**
(b) Explain the advantages and limitations of cascade control. Also give the guidelines for tuning of controllers. **07**
