Seat No.: _____ Enrolment No._____

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: i. Dead time ii. Self regulation	**07**
	(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**

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