Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

ME Semester –I Examination Feb. - 2012

Subject code: 710303N **Date: 17/02/2012**

Subject Name: PID Controller

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.**

Q.1	**(a)**	Give the performance assessment of PID Controller with respect to , i) Process Dynamics ii) Non linear ties	**08**
	(b)	Write short note on interacting and non interacting forms of PID Controller.	**06**
Q.2	**(a)**	Write short note on Proportional Integral Derivative Implementation	**08**
	(b)	What do you mean by model of a physical system? Explain static models in brief.	**06**
		OR	
	(b)	What are the different ways of finding models of a physical systems? Explain two parameters model using step response methods.	**06**
Q.3	**(a)**	What is the significance of D action in PID Controller. Find out values of resistors and capacitors to be used to design a proportional integral controller with a proportional band of 25% and an integration time of 11 seconds. The 4-20 mA input converts into 0-2 V error signal. The output is to be in between 0-10V.	**10**
	(b)	Give the steps of process model identifications	**04**
		OR	
Q.3	**(a)**	The sate space system is given as,	**10**
		A = [0 1 0 0 -1 1 0 -1 -10] and B = [0 0 10], Design a suitable state feedback gain controller to meet design specifications of § (zeta) = 0.5 and ωn = 2 rad/sec	
	(b)	Draw and explain feedforward control scheme for a Heat Exchanger	**04**
Q.4	**(a)**	Explain complete experimental set up for relay feedback system and show how it is used to tune PID Controller parameter	**08**
	(b)	Write short notes on disturbance models.	**06**
		OR	
Q.4	**(a)**	Explain back calculation and tracking in integral anti wind up strategy.	**08**
	(b)	Explain velocity algorithms of PID Controller.	**06**
Q.5	**(a)**	What are the differences between analog PID Controller and Digital PID Controller. Explain the different components of Digital PID Controller in detail.	**08**
	(b)	Write short note Haalman method of analytical tuning	**06**
		OR	
Q.5	**(a)**	Explain the modified Zeigler Nichols method of PID Controller tuning.	**08**
	(b)	Explain Adaptive control system in details..	**06**

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