Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. 1ST Semester Remedial Examination –July- 2011

Subject code: 710303

Subject Name: PID Controller

Date:11/07/2011 **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)**	What are the differences in open loop and closed loop identification of Process Model? Explain three parameters model.	**06**
	(b)	What are the characteristics of Process Noise?. Explain Disturbance Models in details.	**08**
Q.2	**(a)**	Explain: 1) Set point changes 2) Load disturbances 3) Process Variations 4) Disturbance rejection	**08**
	(b)	What do you mean by integrating processes. Explain graphical determination for three parameters model for integrating process	**06**
		OR	
	(b)	Write short note on ON-OFF Control and explain clearly the effects of Proportional band changes in system's response.	**06**
Q.3	**(a)**	Explain interacting and non interacting form of PID Controller?	**06**
	(b)	What do you mean by structure and tuning rule of PID Controller? Explain the position algorithms of PID Controller in details.	**08**
		OR	
Q.3	**(a)**	What do you mean by state variable feedback? Design a pole placement controller for the system represented by following matrices, to obtain desired response having $\xi = 0.7$ and $\omega_n = 4$ rad/sec. A = [-5 1;-6 0], B = [1 2] and C = [2 1].	**10**
	(b)	What are the different methods available for tuning of PID Controller?	**04**
Q.4	**(a)**	Why integral wind up occurs in Process Control? Explain the back calculation and tracking method for integral anti wind up.	**08**
	(b)	What are the limitations of derivative actions? Explain bumpless transfer between manual and automatic.	**06**
		OR	
Q.4	**(a)**	Write short note on determination of dominant pole from frequency response.	**08**
	(b)	Write short note on ratio control scheme and give one physical example where it is frequently used.	**06**
Q.5	**(a)**	Write short note on lamda method of analytical tuning of PID Controller.	**06**
	(b)	What do you mean by adaptive control? Write short note on indirect adaptive controller .	**08**

OR

Q.5	**(a)**	Explain the different cases where PID Controller is not sufficient and some more sophisticated control scheme is needed.	**08**
	(b)	What are the differences between feedforward and feedback control scheme? Give any process control example where feedforward scheme is used.	**06**

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