Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. Sem. – IInd - Examination – June/July- 2011

Subject code: 1720308

Subject Name: Process Control

Date:29/06/2011 **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)**	The temperature of furnace is to be controlled. The rate of flow of fuel to the furnace is the manipulated variable. Pressure of the fuel is secondary variable. Draw a cascade scheme for this system. Can we add one more cascade level in it?	**06**
	(b)	Give the generalized design procedure of Feedforward Control and show the schematic of it.	**08**
Q.2	**(a)**	How integral action can be built up using operational amplifier? Draw and explain Electronic PI Controller using operational amplifier and show its performance with step input output plot.	**08**
	(b)	Explain different distillation equipment in details and discuss about the column variables.	**06**
		OR	
	(b)	Write short note on Vapor recompression control in distillation column.	**06**
Q.3	**(a)**	What is meant by interacting and non interacting system? In a non interacting process of two single capacity tanks in series, where Q1 is inlet flow to tank 1 ,Q2 outlet flow from tank 2 ,liquid heads of H1 and H2 and resistances of R1 and R2. Derive a transfer function between H2 and Q1	**08**
	(b)	.Explain the effect of measurement lag on over all system response. For pneumatic transmission how this lag can be reduced.	**06**
		OR	
Q.3	**(a)**	How magnitude of process load affects the performance of the control system? Explain with suitable example	**08**
	(b)	What are the different methods available for tuning of PID Controller? Explain relay feedback method in details.	**06**
Q.4	**(a)**	Give the Proportional Integral control schematic for a single capacitance process.	**08**
	(b)	Explain two position control of a single capacitance process.	**06**
		OR	
Q.4	**(a)**	Define following term: 1) Transient 2) Process Load 3) Servo response 4) Regulatory response	**08**
	(b)	Write short note on Batch process control.	**06**

Q.5	**(a)**	Explain the working of three element control scheme of a boiler and discuss how it is superior to two element scheme.	**08**
	(b)	Write short note on liquid to liquid heat exchangers and explain the level control scheme for the heat exchanger. .	**06**

OR

Q.5	**(a)**	Explain the feed control for distillation column control.	**08**
	(b)	Write short note on Evaporation controls	**06**

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