Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – WINTER • 2014

Subject code: 1720308 **Date: 05-12-2014**

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)**	Write short note on elements of process dynamics in details.	**07**
	(b)	Explain the two time constant in series system using liquid process with necessary equations.	**07**
Q.2	**(a)**	Briefly narrate the occurrence of differential gap in two position controller. Give electronic implementation of two position controller.	**07**
	(b)	A temperature-control system inputs the controlled variable as a range from 0 to 4V. The output is a heater requiring 0 to 8V. A PID is to be used with Kp=2.5%/%, Ki=10%/(%/min), Kd=0.6%/(%/min). The period of the fastest expected change is estimated to be 9 sec. Develop the PID circuit.	**07**
		OR	
	(b)	Explain Zeigler Nicholas method for PI controller tuning.	**07**
Q.3	**(a)**	Write short note on resistance and capacitance of thermal and gaseous system in details.	**07**
	(b)	Give the Proportional (P) control schematic for a single capacitance liquid level process. Explain the effects on offset and stabilization.	**07**
		OR	
Q.3	**(a)**	Explain the effect of measurement lag in process instrumentation.	**07**
	(b)	Explain cascade control loop with suitable example and state its advantages and disadvantages.	**07**
Q.4	**(a)**	Explain any one scheme for temperature control of superheated steam in boiler.	**07**
	(b)	Explain ratio control loop with suitable example and neat sketch.	**07**
		OR	
Q.4	**(a)**	Explain process degree of freedom and control degree of freedom in details. Find process degree of freedom for liquid to liquid heat exchanger.	**07**
	(b)	Explain operation of floating point control with neat sketch and necessary waveforms.	**07**
Q.5	**(a)**	Write short note on Batch process control.	**07**
	(b)	Explain any one control scheme for condensation in heat exchangers.	**07**
		OR	
Q.5	**(a)**	Write short note on distillation equipment.	**07**
	(b)	Explain feed forward control loop with suitable example and neat sketch.	**07**

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