Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – WINTER • 2013

Subject code: 713002N **Date: 26-12-2013**

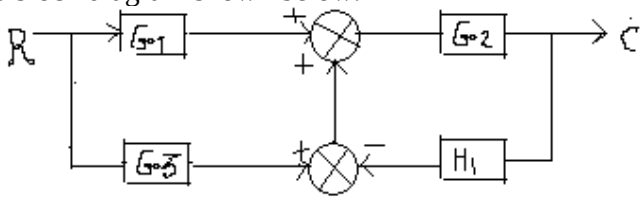
Subject Name: Advance Instrumentation & Process Control

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 is the aim of Plant-automation ? Explain benefits of plant automation.	**07**
	(b)	Explain classification of analytical instrumentation	**07**
Q.2	**(a)**	Derive transfer function for single tank liquid level system with constant flow outlet.	**07**
	(b)	Derive response equation for first order system for sinusoidal input.	**07**
		OR	
	(b)	Explain distributed computer control system with a block-diagram and discuss its advantages and disadvantages.	**07**
Q.3	**(a)**	Describe with a diagram, the computer control of a heat exchanger system.	**07**
	(b)	Compare multi-capacity control systems.	**07**
		OR	
Q.3	**(a)**	Explain z-transform and its use in process control with suitable example.	**07**
	(b)	Explain proportional control system and control valve.	**07**
Q.4	**(a)**	Prove that two first order systems connected in series is equivalent to second order system.	**07**
	(b)	Draw the bode-plot for the system having transfer function $G(s) = Kc/(10S+1)^2$.	**07**
		OR	
Q.4	**(a)**	Draw a root-locus diagram for a system having transfer function -------- $Kc(S+1)/S(S+3)(S+2)$.	**07**
	(b)	Reduce the block diagram shown below.	**07**



Q.5	**(a)**	Explain principle and application of IR spectroscopy.	**07**
	(b)	Write a short note UV spectroscopy in chemical process industry.	**07**
		OR	
Q.5	**(a)**	Explain in detail positive and negative feedback control system.	**07**
	(b)	Short note on Micro controllers.	**07**

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