Seat No.:	Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V • EXAMINATION – WINTER 2013

Subje	Subject Code: 150504 Date: 02-12-2013		
Subject Name: Instrumentation and Process Control Time: 10.30 am - 01.00 pm Instructions: Total Marks: 70			
	2. N	Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks.	
Q.1	(a)	Derive the transfer function for Mercury in glass thermometer clearly indicating the assumption made.	07
	(b)	Derive the transfer function for second order system i.e. Damped vibrator.	07
Q.2	(a) (b)	Derive the transfer function of non-interacting system. Discuss the transfer function for P, PI and PID controller. OR	07 07
	(b)	For manometer discuss the terms like overshoot, decay ratio, rise time, response time and natural period of oscillation.	07
Q.3	(a) (b)	Explain the Routh Test for stability. Given the characteristic equation $3s^4 + 2s^3 + s^2 + 9s + 7 = 0.$ Determine the stability by the Routh Criterion.	07 07
		OR	
Q.3	(a) (b)	Explain Bode diagram for first order system. With example, explain the Servo problem and Regulator problem.	07 07
Q.4	(a) (b)	Write short note on Hydrometer. Explain principle and working of Pitot tube. OR	07 07
Q.4	(a) (b)	Explain the principle and working of Rotameter. Explain bubbler system for liquid level measurement.	07 07
Q.5	(a) (b)	Write short note on "Radiation Pyrometer". Explain principle and working of Orifice meter. OR	07 07
Q.5	(a) (b)	Explain principle and working of Venturimeter. Discuss pressure spring thermometer.	07 07
