Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME- SEMESTER II– EXAMINATION – SUMMER 2015

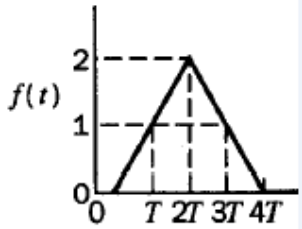
Subject Code: 2723009 **Date:28/05/ 2015**

Subject Name: ADVANCE PROCESS CNTROL

Time: 2:30 PM – 5:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

1	A	Define following terms Z-transform, Sampler, Hold, Stability, Cross-over frequency, Gain margin, Phase margin.	7
	B	Classify advance control systems.	7
2	A	Derive Z- transform for step input function with magnitude A.	7
	B	Find the inversion of $0.2Z/(Z^2+Z+0.4)$ by method of long division method.	7
		OR	
	B	Find inversion of 0632 Z/ (Z^2- 1.368 Z + 0.368) by method of partial fractions.	7
3	A	Explain cascade and split range control systems with example.	7
	B	What is smith predictor ? why it is required ?------Explain.	7
		OR	
	A	Discuss override control system with suitable example.	7
	B	Distinguish feedforward and feedback control systems.	7
4	A	Short note on-----Degrees of freedom and the number of controlled and manipulated variables for the MIMO systems.	7
	B	What is phase-plane analysis ? How it is carried out for a pendulum system ?	7
		OR	
	A	Write a short note on Hold elements.	7
	B	Determine the response equation of open-loop control system for the data given below, Transfer function-- G(s) = 1/ (Ű s+1), G(z) = $\frac{(1/Ű)\ z}{z-e^{-T/Ű}}$ Triangular wave Signal entering the system.  Assume suitable values of T and Ű.	7
5		Attempt any two	14
	A	A case studyð Hydrodealkylation of toluene plant to produce benzeneð Explain.	
	B	Short note onð types of controllers.	
	C	Discussð types of inputs and their responses with graphical presentation.	