## **GUJARAT TECHNOLOGICAL UNIVERSITY**

ME - SEMESTER- II (Old course)• REMEDIAL EXAMINATION – SUMMER 2015 Subject Code: 1720301 Date:12/05/2015

Time: 02:30 pm to 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.

Q.1	(a)	Give comparisons between One Degree of Freedom Feedback Controller and	07
	(b)	Two Degrees of Freedom Feedback Controller Discuss about internal stability and controller realizability with suitable example.	07
Q.2	(a) (b)	Discuss about limits on performance for controller design in detail.  Explain about discretization of PID controller in detail.  OR	07 07
	<b>(b)</b>	Discuss about ZiegleróNichols Methods of Tuning in detail.	07
Q.3	(a)	Discuss about 2-DOF Controller with Integral Action at Steady State in detail.	07
	<b>(b)</b>	Discuss about Bumpless PID Controller with $Tc = Sc$ with required derivations.	07
		OR	
Q.3	(a)	Discuss about PID Controller with Filtering and $Tc = Sc$ with required derivations	07
	<b>(b)</b>	Discuss about the implementation of unstable controller in detail.	07
Q.4	(a) (b)	Give explanation with necessary derivatives on PID tuning through IMC.  Discuss about internal model principle for robustness in detail.  OR	07 07
Q.4	(a)	Discuss about Prediction Error Model Through Noise Splitting with necessary derivations in detail.	07
	(b)	Discuss about Minimum Variance Controller design for ARMAX Systems with necessary derivations	07
Q.5	(a)	Discuss about GPC for ARIX Model with necessary derivations in detail.	07
	<b>(b)</b>	Give explanation on Simplified LQG Control Design.  OR	07
Q.5	(a)	Discuss about Linear Quadratic Regulator design with state space design approach.	07
	(b)	Discuss about the PID Tuning Through Pole Placement Control technique.	07

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