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M. E. - SEMESTER – I • EXAMINATION – WINTER • 2013 Date: 03-01-2014 Subject code: 710303N **Subject Name: PID Controller** 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. (a) Explain two parameter and three parameter models in details. 0.1 07 **(b)** Explain models for Integrating Systems. **07** (a) Explain Relay Feedback method for controller tuning in brief. What is **Q.2** 07 Describing function analysis? **(b)** Explain following in brief in terms of process model: **07** 1. Nonlinearities 2. Parametric Models 3. Process Variations OR **(b)** List the types of process disturbances and explain each one of them in brief. **07** 0.3 (a) What is the significance of I action in PID Controller. Explain the standard, **07** series and parallel form of the PID Algorithm. (b) Explain Limitation of the Derivative Gain and importance of Error-Squared 07 Controllers. OR 0.3 (a) What is Integrator Windup? List all the methods to remove it and explain Back-**07** Calculation and Tracking method in details. **(b)** Explain Digital Implementation of PID controllers. 07 **Q.4** (a) Explain following specifications in terms of controller design 07 1. Sensitivity to measurement noise 2. Sensitivity to Process Characteristics (b) What is significance of Dominant Poles? Explain how to determine the 07 dominant poles from the frequency response. (a) Explain two classical methods for determining the parameters of PID 0.4 07 controllers. **(b)** Explain the Internal Model Controller (IMC). 07 **Q.5** (a) Explain adaptive control and gain scheduling in brief. 07 (b) Explain Cascade control method with an example and list the basic rules for 07 selecting the secondary variable. OR (a) Explain Feed forward control in details with application of combined feedback 0.5 07 and feed forward control.

(b) Write a short note on Fuzzy Control.

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