# SIXTH SEMESTER B.TECH DEGREE EXAMINATION

## 13.603 PROCESS DYNAMICS & CONTROL (A)

Time: 3 Hours Max. Marks : 100

PART – A

(Answer all questions. Each question carries 4 marks. )

1. Explain (a) manipulated variable (b) final control element
2. What is bump less transfer?
3. Explain (a) integral wind up? (b) Process reaction curve
4. What is Cohen – Coon method?
5. Differentiate and explain IAE and ITAE

**PART – B**

(Answer any one question from each Module. )

**Module – I**

6.

a. Distinguish between interacting and non interacting processes. Deduce the transfer functions in each case.

(10 Marks)

b. Obtain mathematical model for a typical thermal system. Explain

( 10 Marks )

7.

a. Distinguish between servo control and regulatory systems. Illustrate with examples .

(10 Marks )

b. Explain the need for piping and Instrumentation diagram ( P-I Diagram). Sketch the P-I diagram for a typical cascaded system.

(10 Marks)

## Module – II

8.

a. Discuss basic controller modes. Compare merits and demerits of composite modes PI, PD and PID.
(10 Marks )

b. What are the various test inputs to the controllers. Explain about response in each case
(10 Marks )

9.

a. What is the selection criteria for choosing controller modes processes –level, pressure , temperature and flow.
(12 mark)

b. Illustrate multi variable control with a example
(8 Marks)

## Module – III

10.

a. Distinguish between cascade and ratio control. Explain using examples.
(10 Marks)

b. What is feed forward control? Explain
(10 Marks)

11.

a. Discuss on interaction between control loops
(8 Marks)

b. What is split range and selective control. Explain
(10 Marks )

## Module – IV

12.

a. What are different types of Pneumatic control valves. Discuss about constructional details.
( 10 Marks)

b. What is a distillation column. Discuss on its dynamics and control
(10 Marks)

13.

a. What are the different criteria for selection of control valves.
(8 Marks )

b. Explain how heat exchangers are controlled in a chemical reactor
(12 Marks )