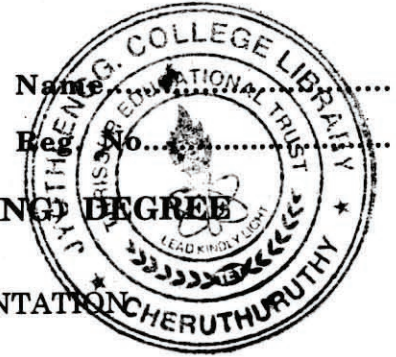


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**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE
EXAMINATION, JUNE 2013**

AI 09 701—PROCESS CONTROL INSTRUMENTATION

(2009 Scheme – Supplementary)

Time : Three Hours

Maximum : 70 Marks

Part A

Answer all questions.

1. What are deviation variables ?
2. Why are linearized approximate models useful for process control purposes ?
3. Define valve sizing.
4. What do you mean by partial decoupling ?
5. List out the applications of PLC.

(5 × 2 = 10 marks)

Part B

Answer any four questions.

1. Distinguish between batch process and continuous process.
2. What are valve positioners ?
3. What is adaptive control ? Why is it needed in a chemical process control ?
4. List out the merits and drawbacks of feed forward control.
5. Can you tune two interacting loops separately and retain the stability of the overall process ? Justify your answer by suitable reasoning.
6. Mention the characteristics of a discrete state process control.

(4 × 5 = 20 marks)

Part C

Answer all questions.

Module I

1. (a) Discuss a system that stores momentum and exhibits first order dynamics.

Or

- (b) (i) What are different types of switches ?
(ii) State basic principle of an hydraulic pumps.

(6 marks)

(4 marks)

Turn over

Module II

2. (a) Explain the design of a feed forward controller for a stirred tank heater.

Or

- (b) Discuss the logic of an inferential control scheme. How this scheme is adopted in a distillation column ?

Module III

3. (a) Explain in detail about the design of non-interacting control loops.

Or

- (b) (i) What are the steps that constitute to basis for experimental identification of process ?

(5 marks)

- (ii) Discuss online identification is a jacketted cooler.

(5 marks)

Module IV

4. (a) Explain the basic structure of a PLC with a neat block diagram.

Or

- (b) Draw a ladder diagram for an automatic control of a two task liquid level process.

[4 × 10 = 40 marks]