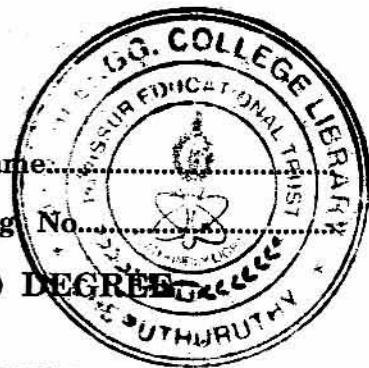


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Name: .....

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

EE 09 705 L23—PROCESS CONTROL AND INSTRUMENTATION

Time : Three Hours

Maximum : 70 Marks

**Part A**

*Answer all questions.*

1. What is meant by ON-OFF control system ?
2. Why do you require an error detector in a process control system ?
3. How does a rotameter act as a control unit ?
4. Mention the advantages of derivative controller ?
5. What is meant by tuning of controller ?

(5 × 2 = 10 marks)

**Part B**

*Answer any four out of six questions.*

6. With suitable examples differentiate between regulatory system and tracking system ?
7. What are the advantages of electrical actuators ?
8. With a neat physical diagram, explain the final control operations for a process ?
9. Explain different, types of 2-mode controllers.
10. Explain the significance of "repeats per minute" for the integral gain of the controllers.
11. How do you assess the quality of the system using minimum area criterion ?

(4 × 5 = 20 marks)

**Part C**

*Answer four full questions.*

12. Explain the different schemes for digital control system.

*Or*

13. Explain how does damping affect the oscillatory behavior for the following systems :—

(a)  $G_1(s) = 1/(s^2 + 3s + 2)$ ; and (b)  $G_2(s) = 1/(s^2 + 2s + 2)$ .

14. Implement a signal conditioning system for RTD ?

*Or*

15. Explain the direct and reverse modes of operation of pneumatic actuator.

**Turn over**

16. Mention the salient features of PID controller ?

*Or*

17. Differentiate between process lag, dead time and control lag with suitable examples.

18. How does Bode plot help to assess the system stability ?

*Or*

19. Explain Ultimate Cycle Method of Ziegler Nichols tuning for a PID-controller.

(4 × 10 = 40 marks)