

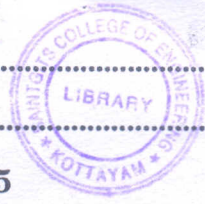
SG AE (NEW)

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Reg. No.....

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**B.TECH. DEGREE EXAMINATION, MAY 2015**

**Sixth Semester**

Branch : Applied Electronics and Instrumentation/Electronics and Instrumentation/  
Instrumentation and Control Engineering

AI 010 601/EI 010 601/IC 010 601—PROCESS CONTROL INSTRUMENTATION  
(AI, EI, IC)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer all the questions.  
Each question carries 3 marks.*

1. Classify the process variables.
2. Describe the advantages of Proportional control mode.
3. Define tuning.
4. Define actuator.
5. Define Cascade control.

(5 × 3 = 15 marks)

**Part B**

*Answer all the questions.  
Each question carries 5 marks.*

6. Explain non-interacting processes.
7. Draw the response curves for a Integral controller to a step error.
8. List down the different types of tuning methods available and explain IAE.
9. Draw the diagram of a Butterfly valve.
10. Explain Inferential control.

(5 × 5 = 25 marks)

Turn over

## Part C

Answer all questions.  
Each full question carries 12 marks.

11. Derive the mathematical model of a Liquid level process. State the assumptions, if any. (12 marks)

Or

12. Explain the terms :

- (a) Self regulating processes.
- (b) Interacting processes.
- (c) Piping and Instrumentation diagram.

(4 + 4 + 4 = 12 marks)

13. With a neat circuit, describe the functioning of an electronic P-I controller. (12 marks)

Or

14. (a) What are the lags involved in process control ? Explain. (6 marks)

- (b) Explain Integral wind-up and prevention. (6 marks)

15. Discuss selection of control modes for pressure process and temperature process. (12 marks)

Or

16. Explain :

- (a) Ziegler Nichols method. (6 marks)

- (b) Damped oscillation method. (6 marks)

17. Draw the diagrams and explain the working of two seat control valve. (12 marks)

Or

18. Write notes on :

- (a) I/P converter. (6 marks)

- (b) Valve positioners. (6 marks)

19. Give the case study of control of a Distillation column. (12 marks)

Or

20. Write notes on (i) combustion control ; (ii) Multivariable process control.

(6 + 6 = 12 marks)

[5 × 12 = 60 marks]

