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G 1397

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Reg. No.....

Name.....

**B.TECH. DEGREE EXAMINATION, MAY 2016**

**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

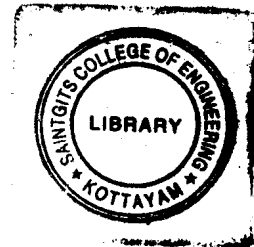
Maximum : 100 Marks

**Part A**

*Answer all questions.*

*Each question carries 3 marks.*

1. Briefly explain the need for process control.
2. What are called self-regulating processes ?
3. What are the different classifications of process variables ?
4. What is meant by integral wind up ?
5. What are the main criterion in the selection of control valves ?



(5 × 3 = 15 marks)

**Part B**

*Answer all questions.*

*Each question carries 5 marks.*

6. Explain briefly about proportional controllers.
7. Explain cascade control with neat diagram.
8. Explain in detail about ball valve, compare it with other types.
9. What is meant by cavitation and flashing in control valves ?
10. Explain damped oscillation method in detail.

(5 × 5 = 25 marks)

**Part C**

*Answer all questions.*

*Each full question carries 12 marks.*

11. Explain the terms process lag and load disturbances in detail and explain about their effect on processes.

Or

Turn over

12. Explain in detail the dynamics of liquid and gas system.
13. What are continuous controller modes? How they are different from composite controllers? Explain the advantages of composite controllers over continuous one.

*Or*

14. (a) What are the different types of electronic controllers?
- (b) Brief on :
  - (i) Bumpless transfer ;
  - (ii) Multiposition control.

15. Explain the process reaction curve method and Ziegler-Nichols method of tuning in detail.

*Or*

16. Explain in detail IAE, ISE, ITAE and compare them.
17. (a) Explain with diagram P/I converter. What are its applications?
- (b) Explain Pneumatic and Electric actuators.

*Or*

18. Explain the construction details of Globe and butterfly valves and also explain the various plug characteristics.
19. Draw and explain ratio, feed forward and adaptive control schemes.

*Or*

20. Explain in detail the distillation column control with suitable diagram. What are the different control schemes in steam boilers?

(5 × 12 = 60 marks)

