S6 AE (NEW)

G 1190 **(Pages : 2)** **Reg. No.....**

Name.....

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]