

23/12/16 AN

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Question Paper Code : 60536

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Sixth Semester

Electronics and Instrumentation Engineering

EI 2352/EI 62/10133 EI 602 – PROCESS CONTROL

(Common to Instrumentation and Control Engineering)

(Regulations 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Distinguish between Batch process and continuous process.
2. What is Servo operation?
3. List the advantages and disadvantages of integral and derivative action, in a PID controller.
4. What is single speed floating control?
5. Write the tuning criteria for continuous cycling method.
6. How is evaluation criteria of controller selected for an application?
7. List the advantage and disadvantages for feed forward control.
8. Draw the split range control block diagram.
9. What is range ability of a control valve?
10. Why an equal percentage valve is called as “equal percentage” valve?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Illustrate servo and regulatory operation with an example for each. (8)
- (ii) Explain continuous and batch process with an example. (8)

Or

- (b) Obtain the mathematical model of a simple first order thermal and level processes. (16)

12. (a) (i) Explain the factors involved in the selection of parameters of ON/OFF controller. (8)
- (ii) Explain why derivative and integral control is not separately recommended for any application. (8)

Or

- (b) (i) Explain with a neat diagram, the functioning of a Electronic PID controller. (8)
- (ii) Describe the functioning of pneumatic PI controller. (8)
13. (a) Explain, how to find the controller settings using process reaction curve with an example. (16)

Or

- (b) Determine the optimum controller settings for the given transfer function $\frac{1}{(s+1)^3}$ using Ziegler-Nichols tuning method. (16)
14. (a) Explain dynamic characteristics of a cascade control system. Explain it with an example? When do you recommend such a control system?

Or

- (b) (i) Explain ratio control of typical process. (8)
- (ii) Explain inferential control scheme with an example. (8)
15. (a) (i) Explain the basic types of valves. Elaborate the selection of valves for different applications. (10)
- (ii) Explain the inherent and installed characteristics of valve. (6)

Or

- (b) (i) Explain the functioning of a current to pressure converter with a neat diagram. (8)
- (ii) What is cavitation and flashing in control valves? How to avoid it? (8)