Reg. No. :

Question Paper Code: 36603

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

Sixth Semester

Instrumentation and Control Engineering

01UIC603 - PROCESS CONTROL

(Regulation 2013)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. List the need for process control.

2. Differentiate discontinuous and continuous mode.

3. Define windup of the controller.

4. Design an electronic p-controller with a proportional gain 5.

5. Why gain margin and phase margin are to be considered, while tuning a controller?

6. Give the difference between split-range control and selective control.

7. State control valve sizing.

8. Differentiate flashing and cavitations in a control valve.

9. Identify the input and output variables of distillation column.

10. Point out any two steps to be taken to increase the efficiency in a mixing process.

PART - B (5 x 16 = 80 Marks)

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

Or

(b) Deduce the mathematical model of thermal system. (16)

12. (a) Explain the characteristics of ON-OFF and single speed floating control. (16)

Or

(b) (i) Compare the features of ON and OFF, P, I, D control modes and draw their characteristics. (8)

(ii) Design an electronic PI controller with proportional gain = 10 and integral gain = $0.18S^{-1}$. (8)

13. (a) Explain the process reaction curve method and Ziegler Nichol's method of tuning a controller. (16)

Or

(b) Explain the process reaction curve method and Ziegler Nichol's method of tuning a controller. (16)

14. (a) Discuss about inherent and installed characteristics of control valve. (16)

Or

(b) Explain about cavitation and flashing. Discuss about the methods to overcome. (16)

15. (a) Explain about the distillation column. (16)

Or

(b) With necessary sketch, explain in detail about CSTR. (16)

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