Reg. No. : | | | | | | | | | | |

Question Paper Code: 31663

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

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. Distinguish between servo and regulator operation of control system.
3. Define windup of the controller.
4. Design an electronic p-controller with a proportional gain 5.
5. Point out the effects of reset time on the controlled process.
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. List the components of heat exchanger.
10. Identify the input and output variables of distillation column.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Explain with suitable examples, the difference between the interacting and non-interacting processes. (8)

(ii) Briefly explain about the self-regulation process with an example. (8)

Or

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

12. (a) (i) With neat schematic diagram, briefly explain about the single speed floating control. (8)

(ii) When an on-off controller is recommended? How its performance affected by process dead time. (8)

Or

(b) Discuss about the electronic controllers to realize

(i) PI (ii) PID control action (16)

13. (a) Write short notes on

(i) ratio control (ii) inferential control (16)

Or

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

14. (a) (i) With a neat diagram, explain the functioning of a valve positioner. What are the advantages of using the same. (10)

(ii) Explain the working of a simple current to pressure converter, with a neat diagram. (6)

Or

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

15. (a) (i) Explain about control of a heat exchanger, using feed forward control. (8)

(ii) Explain feed forward control with an example from distillation column. (8)

Or

(b) Explain the Continuous Stirred Tank Reactor (CSTR). (16)

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