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Question Paper Code: 35054

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

Fifth Semester

Electronics and Instrumentation Engineering

01UEI504 – PROCESS CONTROL INSTRUMENTATION

(Regulation 2013)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Quote self regulation.

2. List any four objectives of process control.

3. Define proportional band.

4. Draw the pneumatic PID controller structure.

5. List the parameters required to design a best controller.

6. Define tuning of controllers.

7. Differentiate inherent characteristics and installed characteristics.

8. Define control valve sizing.

9. Quote ratio control.

10. When is inferential control used?

PART - B (5 x 16 = 80 Marks)

11. (a) Illustrate dynamic behavior of the interacting liquid level system and derive its transfer function model.   (16)

Or

(b) Develop the transfer function for non-interactive capacities of two tank system.

(16)

12. (a) Illustrate the operation of electronic PID controller. (16)

Or

(b) A temperature control system inputs the controlled variable as a range from 0 to $4V$. The output is a heater requiring 0 to $8V$. A PID is to be used with $K_P = 2.4\%/\%$, $K_I = 9\%/(\% - min)$ and $K_D = 0.7\%/(\%/min)$. The period of the fastest expected change is estimated to be 8 Sec. Show the PID circuit. (16)

13. (a) Discuss the operation of process reaction curve method for P, PI and PID controllers.

(16)

Or

(b) Describe the Ziegler- Nichols method of tuning PID Controllers. (16)

14. (a) Draw the diagram for current to pressure converter and discuss its operation. (16)

Or

(b) Define valve sizing and explain the criteria's used for control valve selection for the particular process. (16)

15. (a) With suitable example explain the concept of cascade control. (16)

Or

(b) Explain the following in detail with an example (i) Split range control (ii) Selective control scheme. (16)

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