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Question Paper Code: 35504

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2019

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. List any four objectives of process control.
2. Compare servo and regulatory operation with level control process application.
3. Define proportional band.
4. Draw the pneumatic PID controller structure.
5. Discuss Integral Square Errors (ISE).
6. Define tuning of controllers.
7. Mention the role of valve positioner in control valves.
8. Differentiate flashing and cavitation in a control valve.
9. Quote ratio control.
10. Compare Feed forward and feedback controllers.

PART - B (5 x 16 = 80 Marks)

11. (a) Compare continuous process and batch process. Explain with an example. (16)

Or

- (b) Explain in detail Batch and Continuous process control. (16)
12. (a) Illustrate the operation of electronic PID controller. (16)

Or

- (b) (i) Design PID electronic controller and give its op-amp circuit. $K_p = 2.4 \% / \%$,
 $K_i = 9 \% / (\% / \text{min})$ and $K_d = 0.7 \% / (\% / \text{min})$. (10)
- (ii) Explain the on/off controller characteristics with neat diagram. (6)
13. (a) Discuss the operation of process reaction curve method for P, PI and PID controllers. (16)

Or

- (b) Describe in about the procedure involved in PID tuning from the open loop and closed loop tuning methods. (16)
14. (a) Draw the diagram for current to pressure converter and discuss its operation. (16)

Or

- (b) Briefly explain the cavitations and flashing in detail. (16)
15. (a) With suitable example explain the concept of cascade control. (16)

Or

- (b) What is the need for Ratio control system? Explain with suitable example in detail and also draw its block diagram representation. (16)
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