

Reg. No. :

--	--	--	--	--	--	--	--	--	--

Question Paper Code: 35504

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

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. Define Degrees of Freedom (DoF) and give the classifications of the systems based on DoF.
2. Compare servo and regulatory operation with level control process application
3. Why derivative controller alone not preferred for the noisy process control application?
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. What is process reaction curve?

PART - B (5 x 16 = 80 Marks)

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

Or

(b) Explain in detail Batch and Continuous process control. (16)

12. (a) Elucidate the discontinuous controller modes with examples. (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 $K_p = 2.4\%/%$, $K_I = 9\%/(\% - \text{min})$ and $K_D = 0.7\%/(\% / \text{min})$. The period of the fastest expected change is estimated to be 8 Sec. Show the PID circuit. (16)

13. (a) Describe the evaluation criteria of ISE , IAE and ITAE of the controller settings. (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) Elucidate the problems encountered in cavitation with diagram and also discuss the methods to overcome the problems. (16)

15. (a) Explain the following in detail with an example.

(i) Cascade control scheme (8)

(ii) Ratio control scheme (8)

Or

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