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

Question Paper Code: 35504

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 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. Quote self regulation.
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. Mention the role of valve positioner in control valves.
8. Differentiate flashing and cavitation in a control valve.
9. Quote ratio control.
10. What is process reaction curve?

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Summarize continuous and batch processes. (4)

(ii) Develop the transfer function for interactive capacities of two tank system. (12)

Or

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

12. (a) Elucidate the discontinuous controller modes with examples. (16)

Or

(b) (i) Design PID electronic controller and give its op-amp circuit. Kp = 2.4 % / %, Ki = 9 % / (% / min) and Kd = 0.7 % / (% / min). (10)

(ii) Explain the on/off controller characteristics with neat diagram. (6)

13. (a) Describe the evaluation criteria of ISE , IAE and ITAE of the controller settings. (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) Discuss the process reaction curve method of tuning the controller with neat sketch. (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)