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Name.................................

Reg. No.................................

SEVENTH SEMESTER B.TECH. (ENGINEERING) [09 SCHEME] DEGREE EXAMINATION, NOVEMBER 2016

EE 09 705 L23—PROCESS CONTROL AND INSTRUMENTATION

Time : Three Hours

Maximum : 70 Marks

Part A

Answer all the questions.

1. What is importance of closed loop control ?

2. Distinguish between analog and digital signal conversions.

3. How can the power of a pneumatic actuator be increased ?

4. List out the merits and demerits of PI control.

5. What are the general rules for installation of a PLC ?

(5 × 2 = 10 marks)

Part B

Answer any **four** *questions.*

6. Draw the time response of a second order under damped system when subjected to unit step input and define peak overshoot and settling time.

7. Explain working principle of a pneumatic actuator.

8. List out the merits and drawbacks of feedback control.

9. What are the methods to reduce noise in control valve ?

10. Write short notes on pneumatic controllers.

11. What are factors to be considered in the selection of PLCs ?

(4 × 5 = 20 marks)

Part C

Answer all the questions.

12. Explain in detail various types of relays.

Or

13. (i) Derive time response of a first order system to unit step input.

    (ii) State principle characteristics of a first order process.

(6 marks)

(4 marks)

14. Explain split range control with suitable example.

Or

15. (i) Explain the characteristics of a control valve.

    (ii) Write short notes on cavitations.

(6 marks)

(4 marks)

Turn over

16. Explain the interaction among control loops of a ash drum and distillation column.

Or

17. (i) What are the steps that constitute to basis for experimental identification process ?

(ii) What is meant by define and online process identification ?

18. Explain in detail about timers and counters of a PLC ?

Or

19. (i) What is a ladder diagram ? What are its symbols ? (4 marks)

(ii) Design a PID controller on a PLC. (6 marks)

[4 × 10 = 40 marks]