C 44442 (Pages 2)

Name.....

Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, JUNE 2013

EE 09 L23—PROCESS CONTROL AND INSTRUMENTATION

(2009 Scheme – Supplementary)

Time : Three Hours Maximum : 70 Marks

Part A

Answer **all** *questions.*

1. Mention the role of steady state error in control system evaluation.
2. When do you select a dc motor as an actuator ?
3. What are the advantages of RTD as a thermal sensor ?
4. Mention the applications of 2-position controllers.
5. What is meant by quarter amplitude criterion ?

(5 × 2 = 10 marks)

Part B

Answer any **four** *out of six questions.*

6. Explain the significance of DAC and ADC in process control system.
7. How does an automatic control system improve the controlled system performance ?
8. With a neat diagram explain the working of magnetic flow meter ?
9. Compare the performance of PI and PD controllers ?
10. Explain the effect of process lag in control system, with a suitable example.
11. Determine the gain margin for the unity feedback system with $GH(s) = I/[s(s + 1)]$.

(4 × 5 = 20 marks)

Part C

Answer four full questions.

12. Explain the different components of a typical process control system with the help of block diagram.

Or

13. How do you evaluate the transient response of a system ?
14. With a neat diagram explain the function of hydraulic servo as a control unit.

Or

15. How do you develop a current to pressure conversion mechanism ?

Turn over

16. Substantiate that a PID controller is superior to other controllers ?

Or

17. Explain in detail, the features of a pneumatic PI controller.

18. With suitable examples, mention the salient features of : (a) cascaded control system ; and (b) multivariable control systems.

Or

19. Explain any one of the Ziegler-Nichols tuning method for PD controller.

(4 × 10 = 40 marks)