G 1306 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2016

Seventh Semester

Branch : Applied Electronics and Instrumentation Engineering/Electronics and Instrumentation Engineering

AI 010 702 / EI 010 702—COMPUTERISED PROCESS CONTROL (AI, EI)

(New Scheme—2010 Admission onwards)

[Improvement/Supplementary]

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 3 *marks.*

1. Define SCADA. What are its features ?
2. What are fixed PLC and modular PLC ?
3. What are deadbeat characteristics ?
4. Explain the analog multiplexer used in data acquisition system.
5. Explain the significance and need of grounding.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. Explain the communication among components in SCADA.
7. How is a timer used in a PLC ? Explain the different types of timers used in a PLC.
8. Write an explanatory note on Kalman filter.
9. Explain the control console equipment used in DCS.
10. What is static electricity ? How the hazards caused by it are taken care of ?

(5 × 5 = 25 marks)

Part C

Answer **all** *questions.*
Each full question carries 12 *marks.*

11. Explain the block diagram of SCADA. What are its advantages and applications ?

Or

Turn over

12. Draw and explain the block diagram of a computer control system which uses a multichannel DAS. Explain each component in it.

13. Develop a ladder diagram for controlling the process of maintaining the level at the setpoint in a tank while filling the bottles by opening the outlet valve.

Or

14. With neat diagrams, explain the microprocessor based PLC architecture. Discuss the features of PLC programming languages.

15. Give an account on how PID control algorithm can be mechanized using microprocessor.

Or

16. Explain Dahlin's algorithm for a first order system with the help of a suitable example.

17. Explain the various DAC and ADC used giving their important features.

Or

18. With a practical example, explain how the integration of man-machine integration in carried out with PLC.

19. What are the steps taken in process safety management ? How hazard analysis is done ?

Or

20. Give a clear case study of process hazard analysis of a process control Industry.

(5 × 12 = 60 marks)