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Question Paper Code : 60539

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Seventh Semester

Electronics and Instrumentation Engineering

EI 2402/EI 72/10133 IC 702 — LOGIC AND DISTRIBUTED CONTROL SYSTEM

(Common to Instrumentation and Control Engineering)

(Regulations 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the advantages of PLC over relay logic.
2. Name the common output devices used in ladder rung of PLC.
3. Give an example for program control instruction.
4. Define the instruction used for ON Delay timer operation in PLC.
5. What is SCADA? Give any four editors available in SCADA package.
6. What are the major functions of data acquisition system?
7. Give some applications of DCS.
8. Write some of the bus standards used in process control industry.
9. What flexibility does the control and monitoring systems provide for defining trend data?
10. Write the communication system requirements in DCS.

PART B — (5 × 16 = 80 marks)

11. (a) Draw the architecture of PLC and explain individual components. (16)

Or

- (b) (i) Explain how to convert the fundamental relay schematic diagrams in to PLC ladder logic diagram with an example. (8)

- (ii) Design a PLC program to operate a light according to the following sequence.

- A momentary push button is pressed to start the sequence.
- The light is switched on and remains ON for 2 sec.
- The light is switched off and remains off for 2 sec.
- A counter is incremented after this sequence.
- The sequence then repeats for a total of 4 counts.
- After fourth count, the sequence will stop and the counter will be reset to zero. (8)

12. (a) Discuss the automatic bottle filling system with hardware and ladder diagram. (16)

Or

- (b) (i) Develop a ladder diagram for the case given. A switch will increment the counter on when engaged. This counter can be reset by a second switch. The value in the counter should be multiplied by five and then displayed as a binary output. (8)

- (ii) Discuss how PC can be used as PLC. (8)

13. (a) (i) Explain the block diagram and flow chart of computer controlled systems. (10)

- (ii) Mention about the protocols used in the computer controlled systems. (6)

Or

- (b) Describe about direct digital control systems with example. (16)

14. (a) Explain the importance of DCS and mention the software used in DCS. (16)

Or

- (b) (i) What are all the process interfacing issues related to DCS. (8)
(ii) Mention the important communication facilities used in a process industry. (8)
15. (a) What is the difference between redundancy and Fault tolerance? Explain the redundancy concept available in controller level. (16)

Or

- (b) Explain the structure of typical display hierarchy of industrial control systems with suitable diagram. (16)
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