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**Question Paper Code : 31432**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Seventh Semester

Electronics and Instrumentation Engineering

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

(Common to Instrumentation and Control Engineering)

(Regulation 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the advantages of a PLC system over the traditional hardwired control system.
2. Compare  $T_{on}$  and  $T_{off}$  timers.
3. Write the differences between PC and PLC.
4. State the purpose of program control instructions.
5. What is SCADA? Give any four editors available in SCADA package.
6. What are the major functions of data acquisition system?
7. Compare individual, centralized and distributive control systems.
8. What is the role of communication interfaces in DCS?
9. Justify the need for operator interfaces in DCS.
10. Mention the significance of computers in modern control systems.

**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) Describe the function of program control instructions and develop a program to illustrate their use. (16)

Or

- (b) Construct a PLC program to illustrate the bottle filling process. (16)

13. (a) Distinguish between SCADA and DCS and explain the hardware architecture of SCADA. (16)

Or

- (b) Explain the direct digital control structure with a neat diagram and compare the advantages of DDC over conventional analog controllers. (16)

14. (a) "Communication plays a crucial role in DCS" is it true? Justify with neat sketch. (16)

Or

- (b) Describe the hierarchy of DCS with neat diagram. (16)

15. (a) Explain the different displays followed in industrial control systems. (16)

Or

- (b) Discuss the low level and high level operator interfaces in DCS. (16)